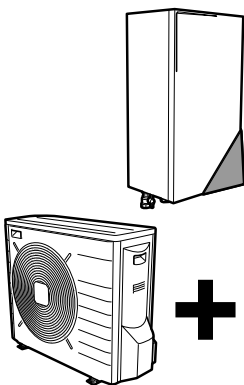




INSTALLER REFERENCE GUIDE

Daikin Altherma - Low Temperature Split



ERLQ004CA
ERLQ006CA
ERLQ008CA

EBH04CA
EBH08CA
EBX04CA
EBX08CA

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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)
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.

**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

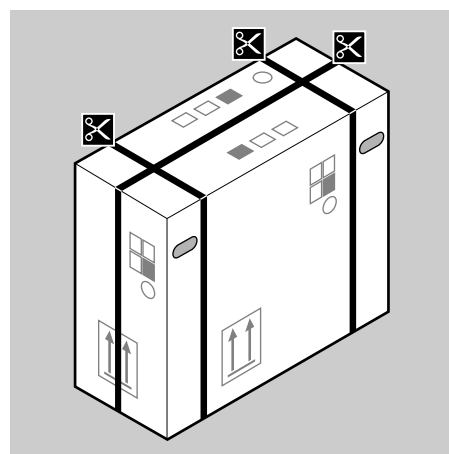
- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.

3 About the box

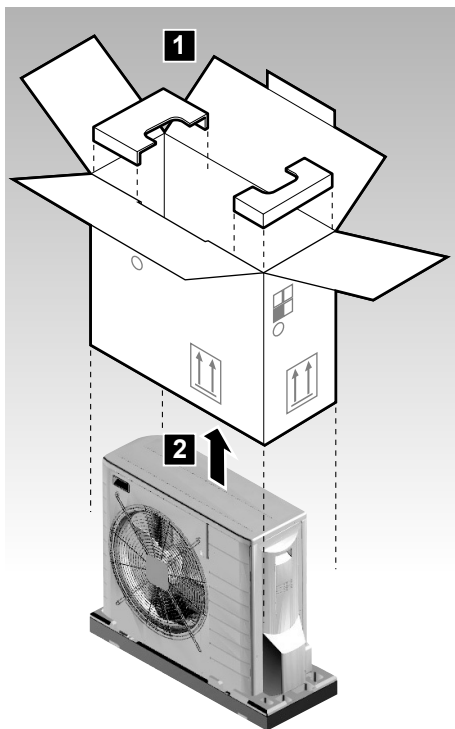
- At delivery, the unit must be checked for damage. Any damage must be reported immediately to the carrier's claims agent.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.

3.1 Outdoor unit

3.1.1 To unpack the outdoor unit



3 About the box



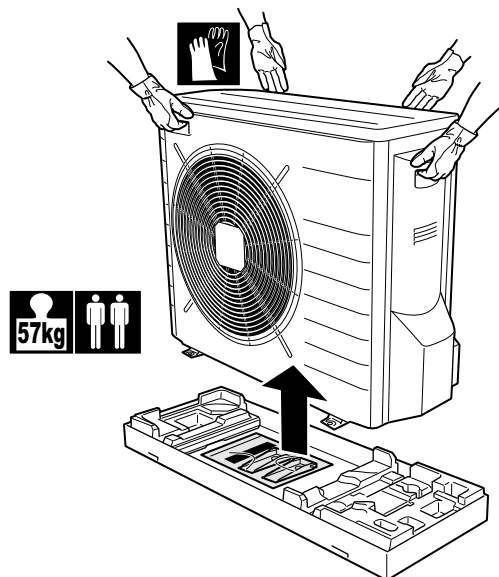
3.1.2 To remove the accessories from the outdoor unit

1 Lift the outdoor unit.

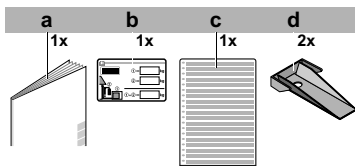


CAUTION

Only handle the outdoor unit as follows:



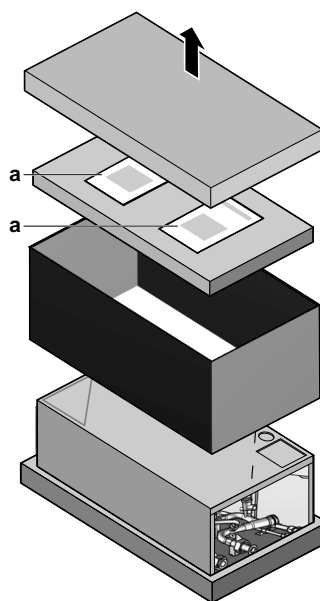
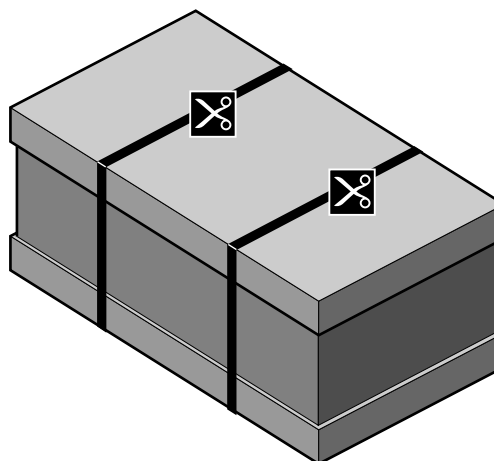
2 Remove the accessories at the bottom of the package.



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

3.2 Indoor unit

3.2.1 To unpack the indoor unit



a Installation manual, operation manual, CD



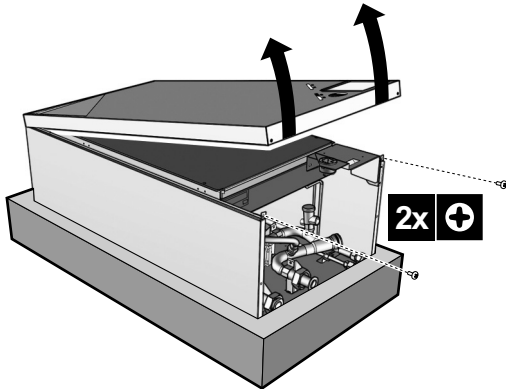
INFORMATION

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

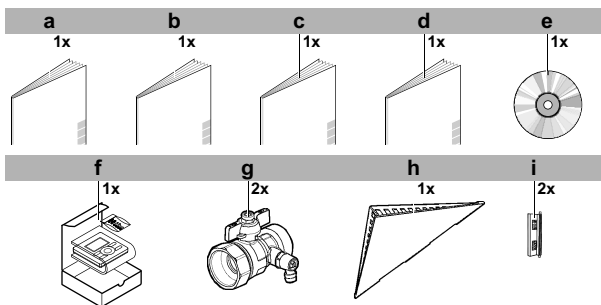
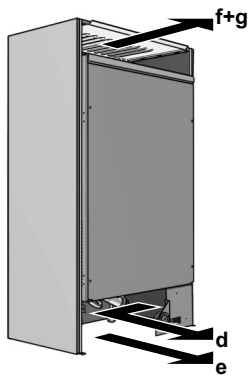
3.2.2 To remove the accessories from the indoor unit

The installation manual indoor unit, operation manual, and CD are located in the upper part of the box. Follow the procedure below to remove the other accessories.

- 1 Remove the screws at the bottom of the unit.
- 2 Tilt the bottom side of the front panel upwards and remove it.



- 3 Remove the accessories.



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

4 About the units and options

4.1 Identification



NOTICE

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

4.1.1 Identification label: Outdoor unit

Location



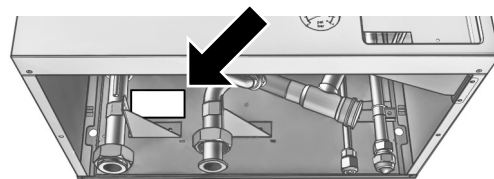
Model identification

Example: ER L Q 006 CA V3

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

4.1.2 Identification label: Indoor unit

Location



4 About the units and options

Model identification

Example: E HB H 04 CA 3V

Code	Description
E	European model
HB	HB=Wall-mounted indoor unit
H	■ H=Heating only ■ X=Heating/cooling
04	Capacity class: ■ 04=4 kW ■ 08=8 kW ■ 16=16 kW
CA	Series
3V	Backup heater model ■ 3V ■ 9W

4.2 Possible combinations of units and options

4.2.1 List of options for outdoor unit

Drain pan (EKDP008CA)

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

- Drain pan
- Installation brackets

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

Drain pan heater (EKDPH008CA)

The drain pan heater is required to avoid freezing-up of the drain pan. It is recommended to install this option in colder regions with possible low ambient temperatures or heavy snowfall.

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

U-beams (EKFT008CA)

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

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

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

4.2.2 List of options for indoor unit

User interface (EKUCAL1, EKUCAL2)

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 EKUCAL1 contains the 6 common languages: English, German, French, Dutch, Italian, Spanish.

The additional user interface EKUCAL2 contains other languages: English, Swedish, Norwegian, Czech, Turkish, Portuguese.

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

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

Room thermostat (EKRTWA, 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 EHBH/X16 models: Can be integral part of solar kit EKSOLHW

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 (EKRS01-1)

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

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

For installation instructions, see the installation manual of the remote outdoor sensor.



INFORMATION

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

PC configurator (EKPCAB1)

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.

Drain pan kit (EKHBDPCA2)

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

For installation of this option into the indoor unit, refer to the installation manual delivered with this option kit.

Solar kit (EKSOLHW)

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

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

Domestic hot water tank

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

The domestic hot water tank is available in 2 types:

- Stainless steel tank (EKHWS and EKHWSU (only for UK))
There are 3 types available: 150, 200, and 300 liter.
- Enamelled tank (EKHWE and EKHWE (wallmounted version))
There are 3 types of EKHWE: 150, 200, and 300 liter.
There is 1 type of EKHWE: 150 liter.

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

4.2.3 Possible combinations of indoor unit and outdoor unit

Indoor unit	Outdoor unit		
	ERLQ004CAV3	ERLQ006CAV3	ERLQ008CAV3
EHBH04CA3V	O	—	—
EHBX04CA3V	O	—	—
EHBH08CA3V	—	O	O
EHBX08CA3V	—	O	O
EHBH08CA9W	—	O	O
EHBX08CA9W	—	O	O

4.2.4 Possible combinations of indoor unit and domestic hot water tank

Indoor unit	Domestic hot water tank			
	EKHS	EKHSU	EKHWE	EKHWE
EHBH04CA3V	O	O	O	O
EHBX04CA3V	O	O	O	O
EHBH08CA3V	O	O	O	O
EHBX08CA3V	O	O	O	O
EHBH08CA9W	O	O	O	O
EHBX08CA9W	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 the configuration chapter.

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.

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

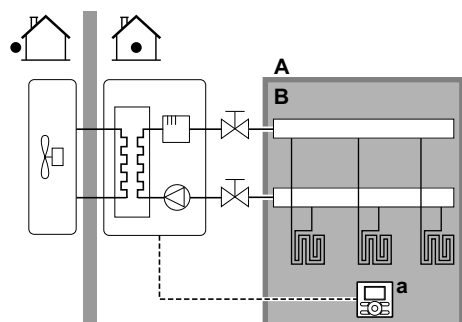
- How many rooms are heated (or cooled) by the Daikin heat pump system?
- Which heat emitter types are used in each room and what is their design leaving water temperature?

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

- 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 EKUCAL) installed in the room and used as room thermostat

Configuration

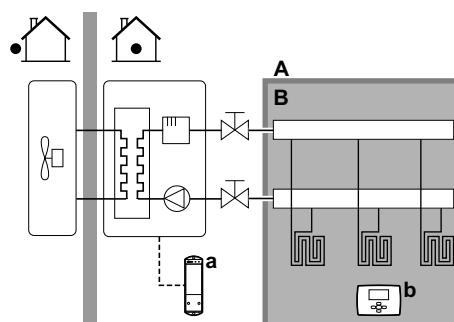
Setting	Value
Unit temperature control: ■ #: [A.2.1.7] ■ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ■ #: [A.2.1.8] ■ Code: [7-02]	0 (1 LWT zone): Main

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 EKTR1).

Configuration

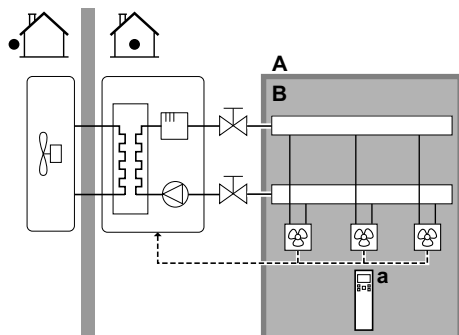
Setting	Value
Unit temperature control: ■ #: [A.2.1.7] ■ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ■ #: [A.2.1.8] ■ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the main zone: ■ #: [A.2.2.4] ■ Code: [C-05]	Configure according to the setup: ■ 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. ■ 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.

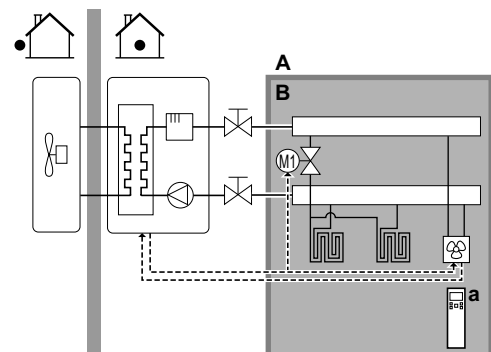
Benefits

- **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

5 Application guidelines

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

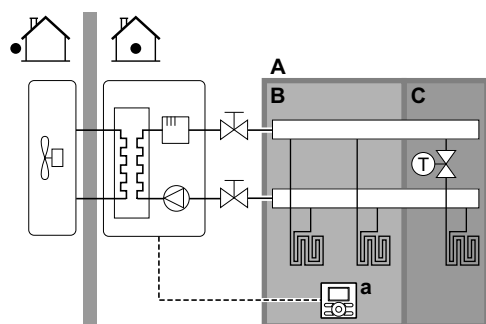
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

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.



NOTICE

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

Configuration

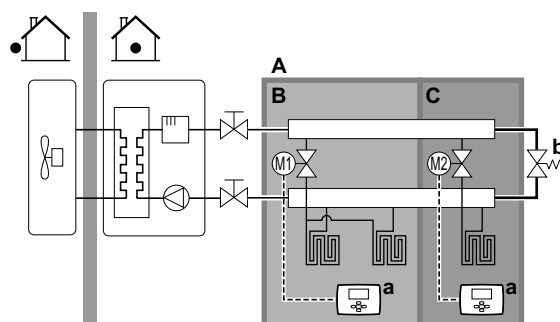
Setting	Value
Unit temperature control: ■ #: [A.2.1.7] ■ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ■ #: [A.2.1.8] ■ Code: [7-02]	0 (1 LWT zone): Main

Benefits

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

Under floor heating or radiators – Multiple external room thermostats

Setup



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

- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating 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: ■ #: [A.2.1.7] ■ Code: [C-07]	0 (LWT control): Unit operation is decided based on the leaving water temperature.
Number of water temperature zones: ■ #: [A.2.1.8] ■ Code: [7-02]	0 (1 LWT zone): Main

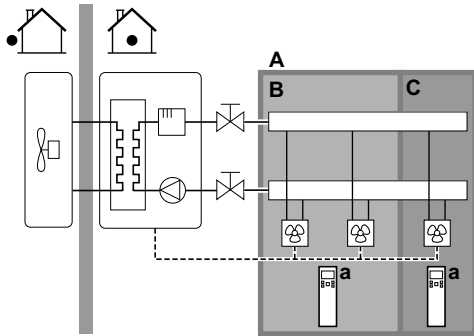
Benefits

Compared with under floor heating or radiators for one room:

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

Heat pump convectors

Setup



- A Main leaving water temperature zone
- B Room 1
- B 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.



NOTICE

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

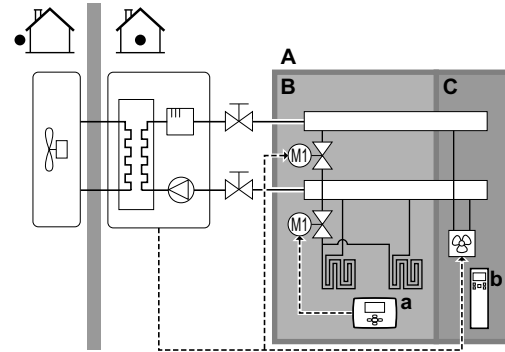
Benefits

Compared with heat pump convectors for one room:

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

Combination: Under floor heating + Heat pump convectors

Setup



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

- For each room with heat pump convectors: The heat pump convectors are directly connected to the indoor unit.
- For each room with under floor heating: 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.



NOTICE

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

5 Application guidelines



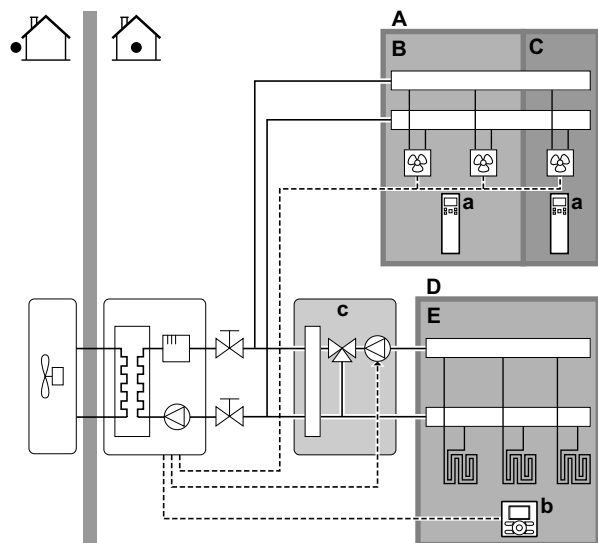
CAUTION

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: <ul style="list-style-type: none"> In heating: 35°C In cooling: 20°C (only refreshment, no real cooling allowed)
Bed rooms (additional zone)	Heat pump convectors: <ul style="list-style-type: none"> In heating: 45°C In cooling: 12°C

Setup



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

- For the main zone:
 - A mixing valve station is installed before the under floor heating.
 - The pump of the mixing valve station is controlled by the ON/OFF signal on the indoor unit (X2M/5 and X2M/7; normal closed shut-off valve output).
 - The room temperature is controlled by the user interface, which is used as room thermostat.
- For the additional zone:
 - The heat pump convectors are directly connected to the indoor unit.
 - The desired room temperature is set via the remote controller of the heat pump convectors for each room.
 - The heating 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 functionality ■ Other 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.

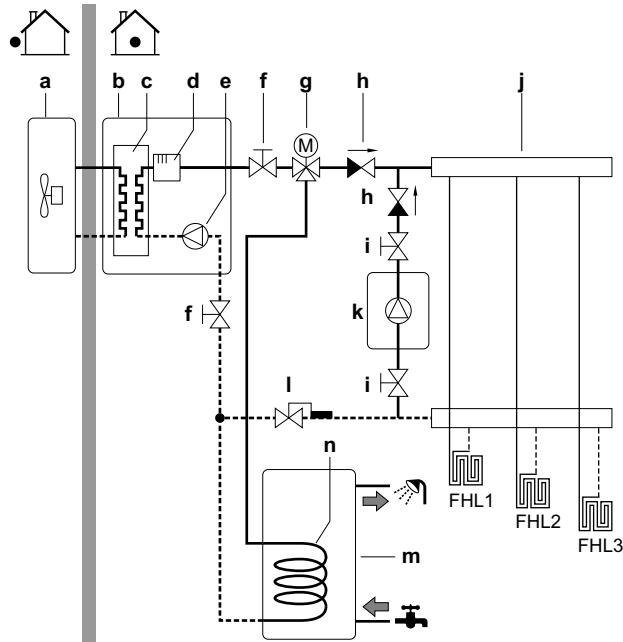


INFORMATION

- 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:



- 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)(field supply)
- h Non-return valve
- i Shut-off valve
- j Collector (field supply)
- k Auxiliary boiler (field supply)
- l Aquastat valve (field supply)
- m DHW tank (option)
- n Heat exchanger coil
- FHL1...3 Under floor heating



NOTICE

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

- Make sure the return water to the heat pump does NOT exceed 55°C. To do so:
 - Set the desired water temperature via the auxiliary boiler controller to maximum 55°C.
 - Install an aquastat valve in the return water flow of the heat pump.
 - Set the aquastat valve to close above 55°C and to open below 55°C.
- Install non-return valves.

- Make sure to only have one expansion vessel in the water circuit. An expansion vessel is already premounted in the indoor unit.
- Install the digital I/O PCB (option EKR1HB).
- Connect X1 and X2 (changeover to external heat source) on the PCB to the auxiliary boiler thermostat.
- To setup the heat emitters, see setting up the space heating/cooling application guidelines).

Configuration

Via the user interface (quick wizard):

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

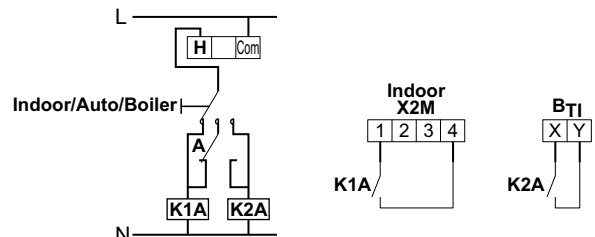


NOTICE

- 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 setting up space heating/cooling application guideline).
- The auxiliary contact can be:
 - An outdoor temperature thermostat
 - An electricity tariff contact
 - A manually operated contact
 - ...
- Setup: Connect the following field wiring:



- Bt1 Boiler thermostat input
- A Auxiliary contact (normal closed)
- H Heating demand room thermostat (optional)
- K1A Auxiliary relay for activation of indoor unit (field supply)
- K2A Auxiliary relay for activation of boiler (field supply)
- Indoor Indoor unit
- Auto Automatic
- Boiler Boiler



NOTICE

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

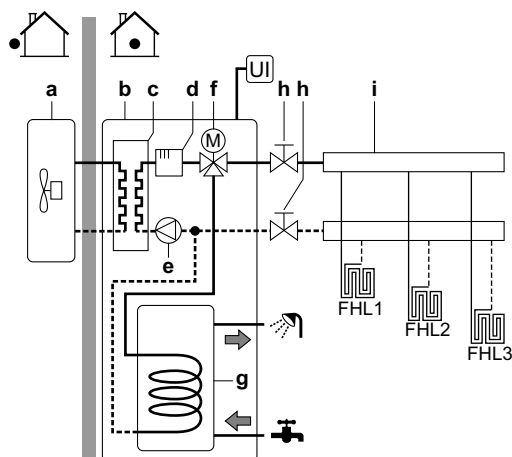
5 Application guidelines

5.4 Setting up the domestic hot water tank

The DHW tank can be:

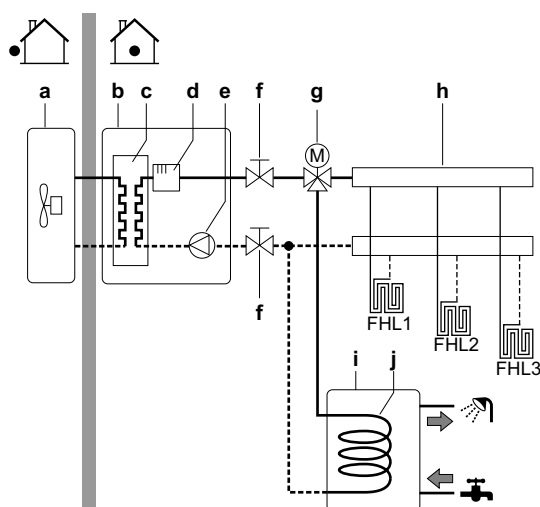
- Integrated in the indoor unit
- Installed standalone as option

5.4.1 System layout – Integrated DHW tank



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

5.4.2 System layout – Standalone DHW tank



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

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:

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

Possible DHW tank volumes

Type	Possible volumes
Integrated DHW tank	<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: <div> <div>■ $V_2 = 180 \text{ l}$</div> <div>■ $T_2 = 54^\circ\text{C}$</div> <div>■ $T_1 = 15^\circ\text{C}$</div> </div> Then $V_1 = 280 \text{ l}$
$V_2 = V_1 \times (40 - T_1) / (T_2 - T_1)$	If: <div> <div>■ $V_1 = 480 \text{ l}$</div> <div>■ $T_2 = 54^\circ\text{C}$</div> <div>■ $T_1 = 15^\circ\text{C}$</div> </div> Then $V_2 = 307 \text{ l}$

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

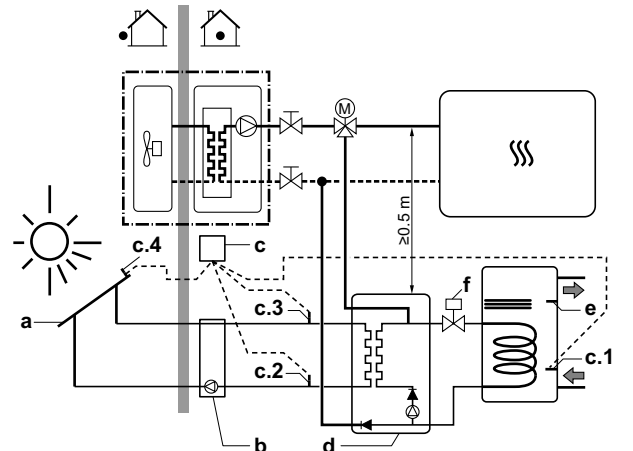
5.4.4 Setup and configuration – DHW tank

- 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 the configuration chapter.
 - Connecting the electrical wiring of the standalone DHW tank to the indoor unit, see the installation chapter.
 - 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.

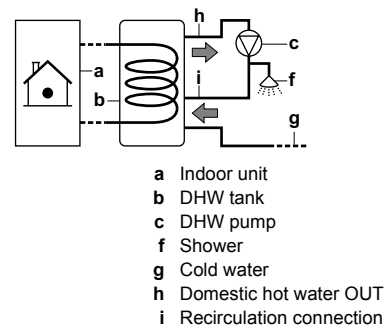
For installation instructions, see the installation manual of the solar kit and addendum book for optional equipment.



- 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.
 - For more information about connecting the recirculation connection (for integrated DHW tank), see the installation chapter.

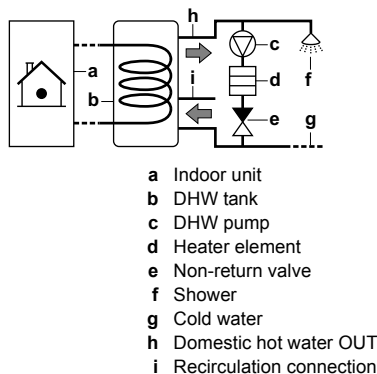
Configuration

- For more information, see the configuration chapter.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

5 Application guidelines

5.4.7 DHW pump for disinfection

Setup



- 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 the configuration chapter.

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

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



NOTICE

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 technical data.
 - 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.



NOTICE

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.

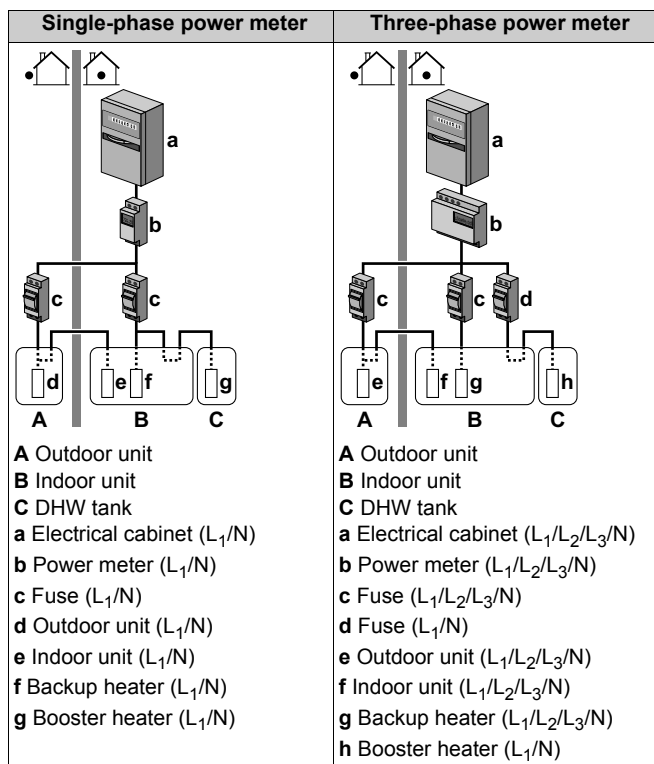
Setup

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.
 - 230V and 400V 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 preferential kWh rate power supply 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

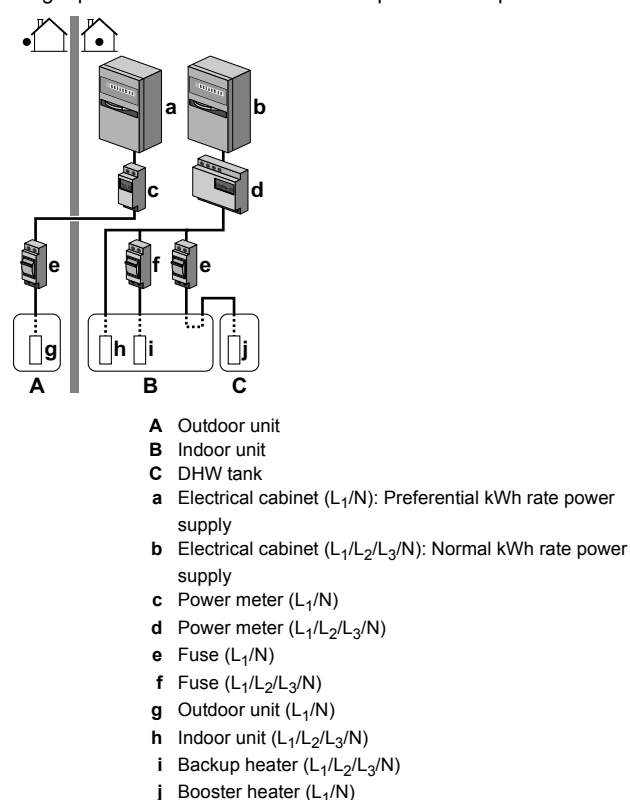
- Connect power meter 1 to X5M/7 and X5M/8.
- Connect power meter 2 to X5M/9 and X5M/10.

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

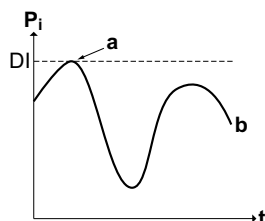
5.6.1 Permanent power limitation

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.7.2] via the user interface (for the description of all settings, see configuration chapter):
 - 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).

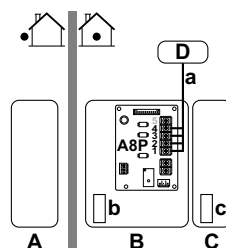
5.6.2 Power limitation activated by digital inputs

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

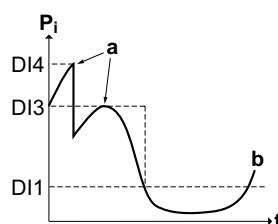
The power or current of the entire Daikin system is limited dynamically by digital inputs (maximum four steps). Each power limitation level is set via the user interface by limiting one of the following:

- 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 = strongest limitation (lowest energy consumption)
 - DI4 = weakest limitation (highest energy consumption)
- For the specification and the connection of the digital inputs, see technical data > wiring diagram.

Configuration

Set the power consumption control settings in [A.7.2] via the user interface (for the description of all settings, see configuration chapter):

- 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.

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.

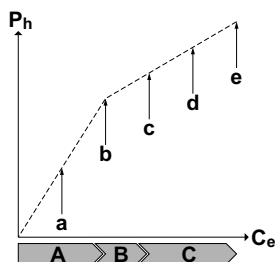
If... has priority	Then set the heater priority via the user interface to...
Domestic hot water production	Booster heater. Result: The backup heater will be turned OFF first.
Space heating	Backup heater. Result: The booster heater will be turned OFF first.

- 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 outdoor sensor.
- Configuration: Select room sensor [A.2.2.B].

Outdoor ambient temperature

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

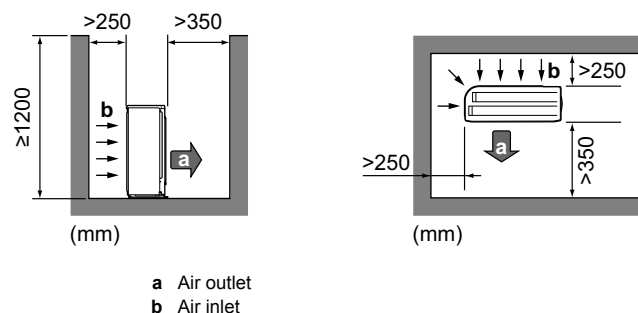
6 Preparation**6.1 Preparing installation site**

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 outdoor unit

Mind the following spacing guidelines:



- a** Air outlet
b Air inlet

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

**NOTICE**

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

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

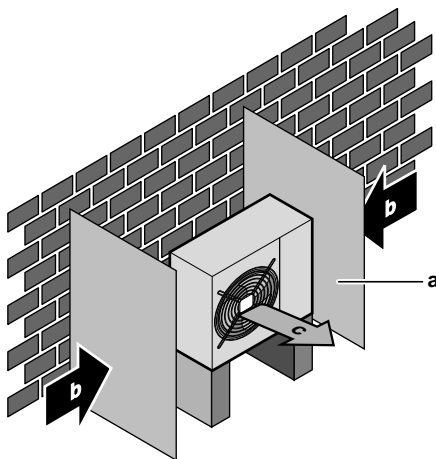
Strong winds (≥ 18 km/h) blowing against the outdoor unit's air outlet causes short circuit (suction of discharge air). This may result in:

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

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

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

6 Preparation



- a Baffle plate
- b Prevailing wind direction
- c Air outlet

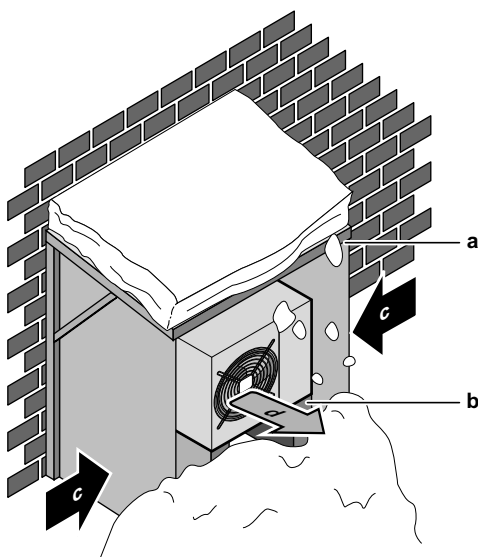
- Choose a location where the hot/cold air discharged from the unit or the operation noise, will NOT disturb anyone.
 - Heat exchanger fins are sharp and injury is possible. Choose an installation location where there is no risk for injury (especially in areas where children playing).
 - Do NOT install 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 "15.10 Sound spectrum" on page 97 due to environmental noise and sound reflections.

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

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

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

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



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

- The unit should be installed in a way that a minimum of 15 cm free space is assured below the bottom plate of the unit at all weather conditions (e.g., heavy snowfall). It is recommended to install the unit at a minimum height of 30 cm. See "7.2 Mounting the outdoor unit" on page 27 for more details.
- In heavy snowfall areas it is very important to select an installation site where the snow will NOT affect the unit. If lateral snowfall is possible, make sure that the heat exchanger coil is NOT affected by the snow. If necessary, install a snow cover or shed and a pedestal.

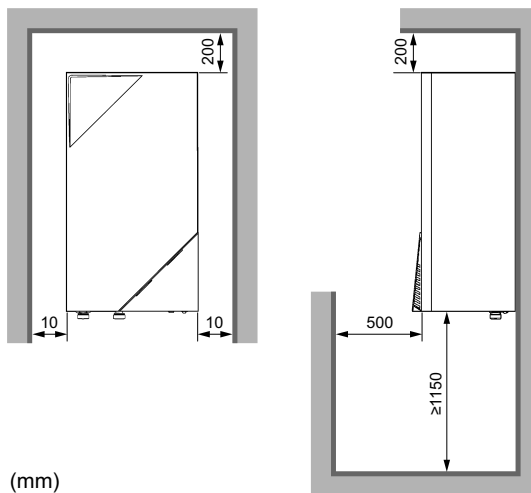
6.1.3 Installation site requirements of the indoor unit

- Mind the measurement guidelines:

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

(a) Check the outdoor unit installation manual.

- Mind the following spacing installation guidelines:



(mm)

Do NOT install the unit in places such as:

- Where there is mist of mineral oil, oil spray or vapour. Plastic parts may deteriorate, and cause them to fall out or water to leak.
 - 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 "15.10 Sound spectrum" on page 97 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°C.

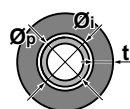
- The indoor unit is designed for indoor installation only and for ambient temperatures ranging 5~35°C in cooling mode and 5~30°C in heating mode.

6.2 Preparing refrigerant piping

6.2.1 Refrigerant piping insulation

- Use polyethylene foam as insulation material:
 - with a heat transfer rate between 0.041 and 0.052 W/mK (0.035 and 0.045 kcal/mh°C)
 - with a heat resistance of at least 110°C
- Insulation thickness

Pipe outer diameter (Ø _p)	Insulation inner diameter (Ø _i)	Insulation thickness (t)
6.4 mm (1/4")	8~10 mm	10 mm
15.9 mm (5/8")	16~20 mm	13 mm



6.2.2 Refrigerant piping requirements

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

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

6.3 Preparing water piping

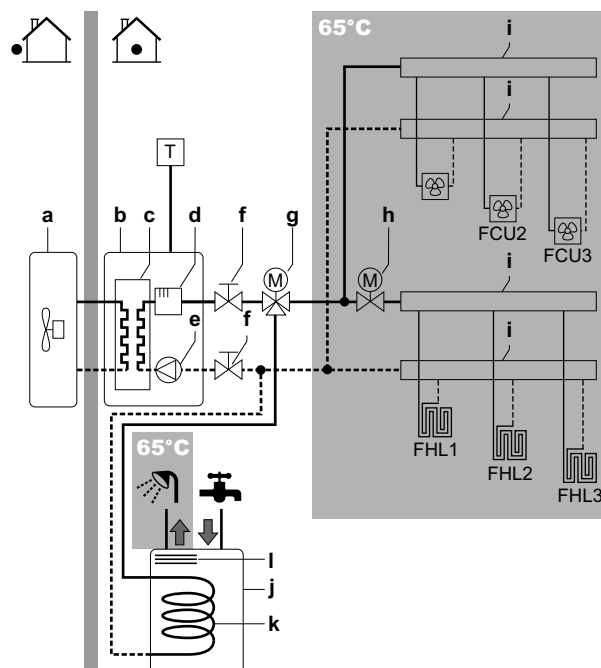
6.3.1 Water circuit requirements

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



INFORMATION

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



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

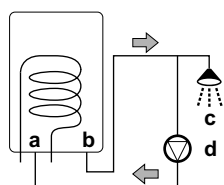
- Make all water piping connections in accordance with the applicable legislation and the outlook diagram that is delivered with the unit, respecting the water inlet and outlet.
- Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
- 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 coming into contact with electrical parts.
- Provide air vents at all high points of the system, which must also be easily accessible for servicing. An automatic air purge is provided in the indoor unit. Check that the air purge is NOT tightened too much, so that automatic release of air in the water circuit is possible.
- Only use materials that are compatible with water used in the system and with the materials used in the indoor unit.
- Check that all components in the field piping can withstand the water pressure and water temperature.
- When using non-brass metallic piping, insulate the brass and non-brass properly so that they do NOT make contact with each other. This to prevent galvanic corrosion.
- Never use Zn-coated parts in the water circuit. Because the unit's internal water circuit uses copper piping, excessive corrosion may occur.
- Only use appropriate tooling to handle brass, which is a soft material. If NOT, pipes will get damaged.
- Select the water piping diameter in relation to the required water flow and the available external static pressure of the pump. See "15 Technical data" on page 72 for the external static pressure curves of the indoor unit.

6 Preparation

- 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

6.3.2 Formula to calculate the expansion vessel pre-pressure

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

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

6.3.3 To check the water volume

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

To make sure that the unit operates properly:

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

Minimum water volume

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



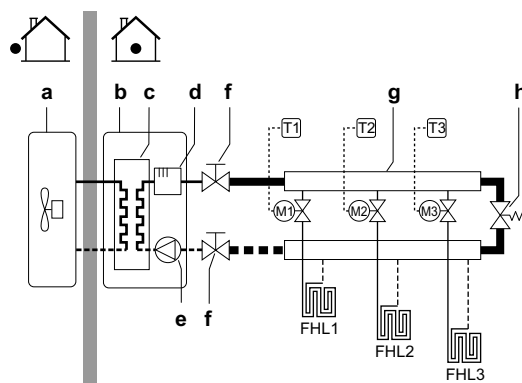
INFORMATION

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



NOTICE

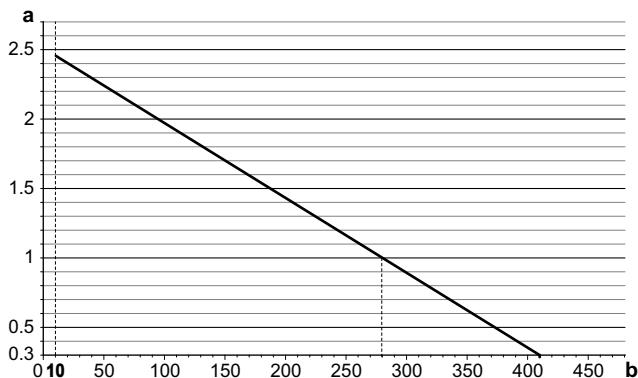
When circulation in each space heating loop is controlled by remotely controlled valves, it is important that the minimum water volume is guaranteed, even if all of the valves are closed.



- 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.



a Pre-pressure (bar)

b Maximum water volume (l)

Example: Maximum water volume and expansion vessel pre-pressure

Installation height difference ^(a)	Water volume	
	≤280 l	>280 l
≤7 m	No pre-pressure adjustment is required.	Do the following: <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.

6.3.4 Changing the pre-pressure of the expansion vessel



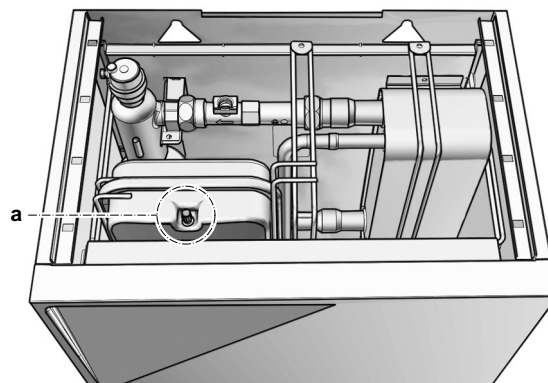
NOTICE

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

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

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

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



a Schröder valve

6.3.5 To check the water volume: Examples

Example 1

The indoor unit is installed 5 m below the highest point in the water circuit. The total water volume in the water circuit is 100 l. No actions or adjustments are required.

Example 2

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

Actions:

- Because the total water volume (350 l) is more than the default water volume (280 l), the pre-pressure must be decreased.
- The required pre-pressure is:
 $P_g = (0.3 + (H/10)) \text{ bar} = (0.3 + (0/10)) \text{ bar} = 0.3 \text{ bar}.$
- 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 Preparation

6.4 Preparing electrical wiring

6.4.1 About preparing electrical wiring



WARNING

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



WARNING

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



WARNING

The backup heater should have a dedicated power supply.

6.4.2 About preferential kWh rate power supply

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

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

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

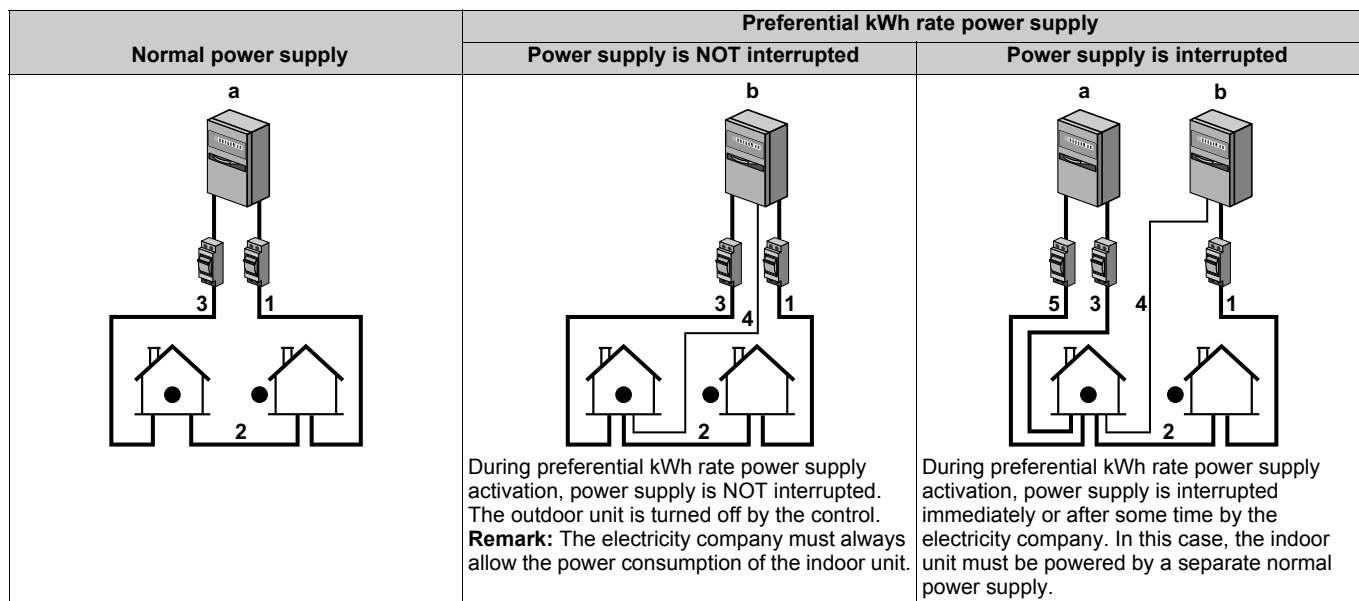
When the equipment is connected to such preferential kWh rate power supply, the electricity company is allowed to:

- interrupt power supply to the equipment for certain periods of time;
- demand that the equipment only consumes a limited amount of electricity during certain periods of time.

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

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

6.4.3 Overview of electrical connections except external actuators



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

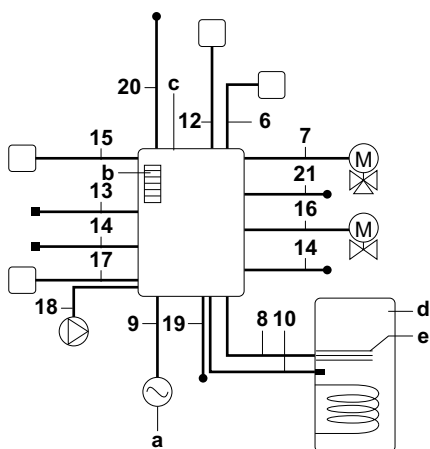
6.4.4 Overview of electrical connections for external and internal actuators

The following illustration shows the required field wiring.



INFORMATION

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



- a Single power supply for outdoor unit, backup heater and booster heater
- b Backup heater
- c Indoor unit
- d Domestic hot water tank
- e Booster heater

Item	Description	Wires	Maximum running current
16	Shut-off valve	2	(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) The thermistor and connection wire (12 m) are delivered with the domestic hot water tank.
- (e) Cable section 0.75 mm² till 1.25 mm²; maximum length: 50 m. Voltage-free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.
- (f) Cable section 0.75 mm² till 1.25 mm²; maximum length: 500 m. Applicable for both single user interface and dual use interface connection.

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

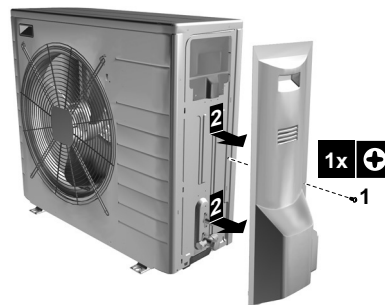
Item	Description	Wires	Maximum running current
Outdoor unit and indoor unit power supply			
1	Power supply for outdoor unit	2+GND or 3+GND	(a)
2	Power supply and interconnection cable to indoor unit	3	(c)
3	Power supply for backup heater	See table below.	—
4	Preferential kWh rate power supply (voltage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

7 Installation

7.1 Opening the units

7.1.1 To open the outdoor unit

- 1 Remove 1 screw from the service cover.

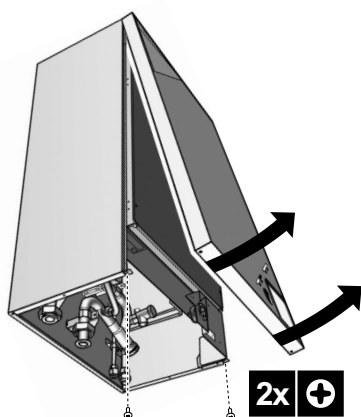


- 2 Remove the service cover.

7 Installation

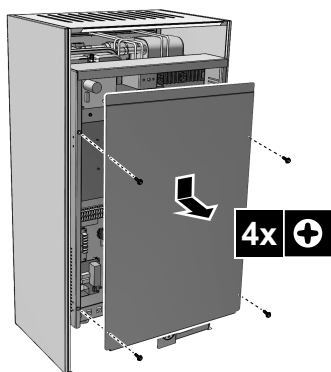
7.1.2 To open the indoor unit

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



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

7.1.3 To open the switch box cover of the indoor unit



7.2 Mounting the outdoor unit

7.2.1 To prepare the installation structure

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

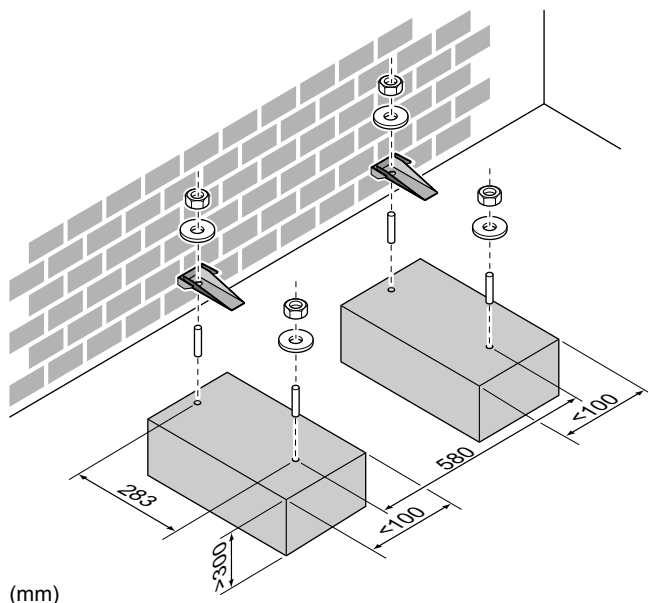
Fix the unit securely by means of the foundation bolts in accordance with the foundation drawing.

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

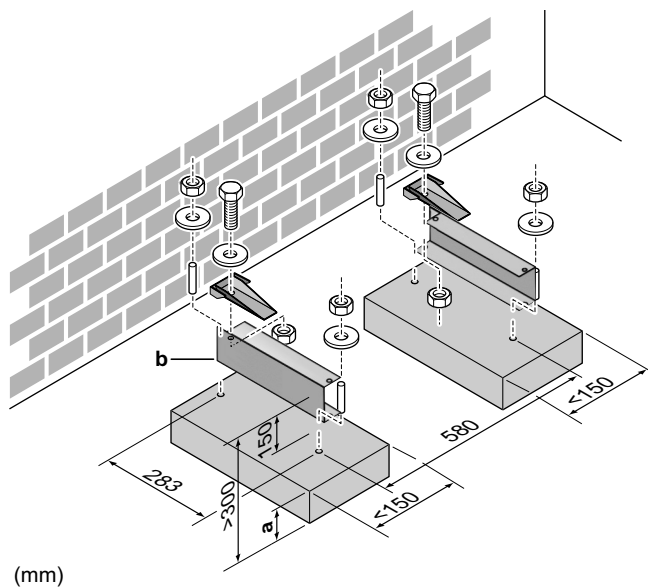


INFORMATION

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

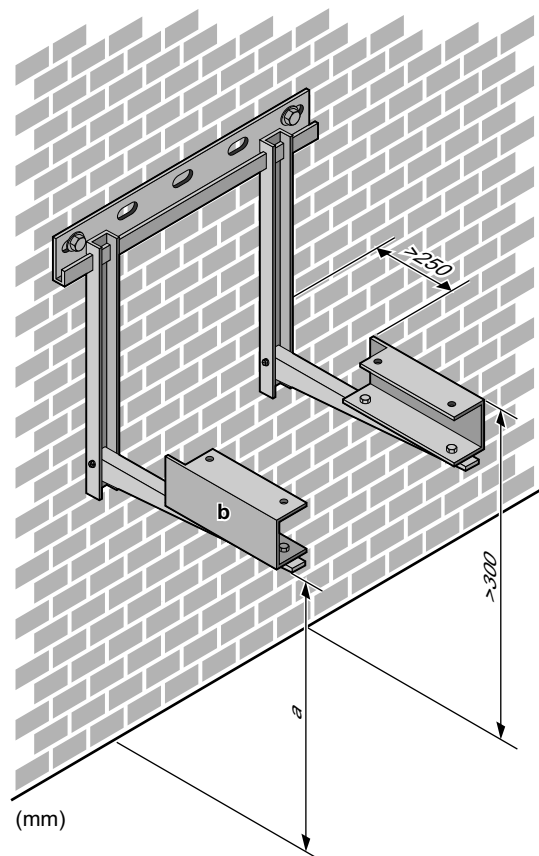


In order to guarantee good operation of the unit in areas with risk of snowfall, a minimum of 15 cm needs to be assured below the bottom plate of the unit. It is recommended to construct a pedestal with the same height as the maximum snowfall height. On this pedestal it is then recommended to install the EKFT008CA option kit to guarantee the minimum space of 15 cm below the bottom plate of the unit.

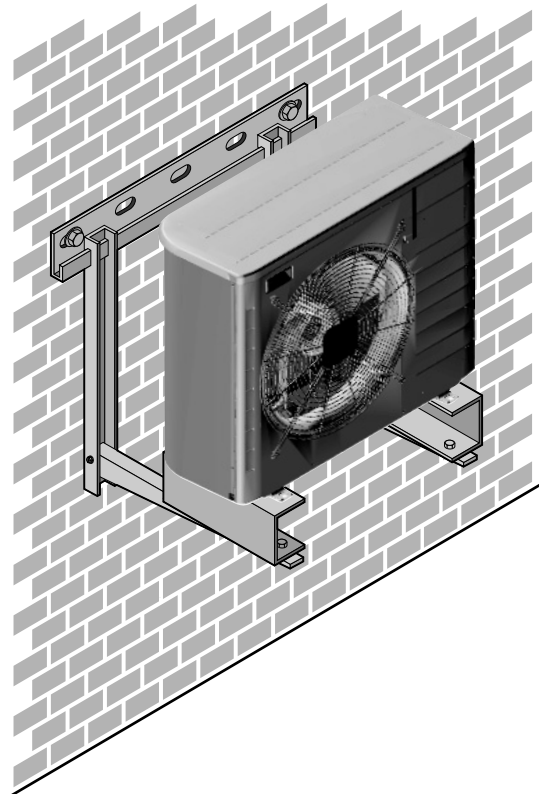


- a Maximum snowfall height
- b EKFT008CA option kit

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



- a Maximum snowfall height
- b EKFT008CA option kit



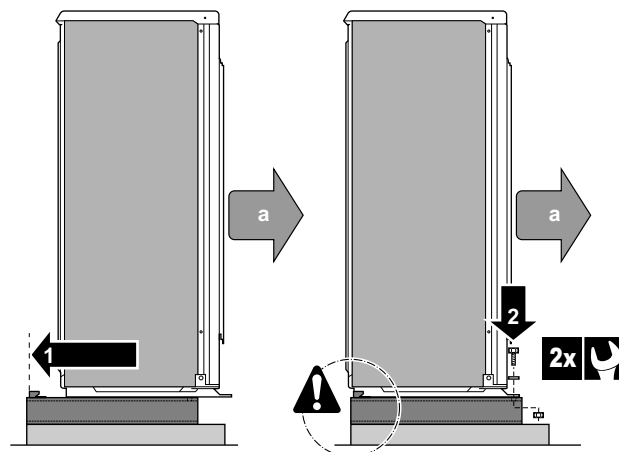
7.2.2 To install the outdoor unit



CAUTION

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

- 1 Lift the outdoor unit as described in To remove the accessories from the outdoor unit.
- 2 Install the outdoor unit as follows:



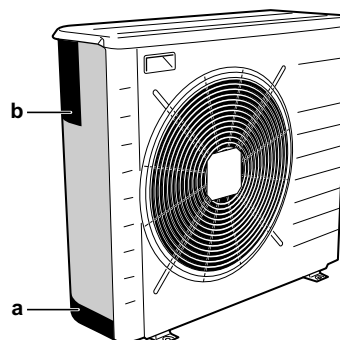
a Air outlet



NOTICE

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

- 3 Remove the protective cardboard and instruction sheet.



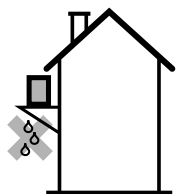
- a Protective cardboard
- b Instruction sheet

7.2.3 To prepare drain work

- Avoid installation places where water leaking from the unit due to a blocked drain pan, cause damage to the location.
- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is a proper drainage in order to avoid ice accumulation.
- Prepare a water drainage channel around the foundation to drain waste water surrounding the unit.
- Avoid drain water flowing over the footpath, so that it does not become slippery in case of ambient freezing temperatures.

7 Installation

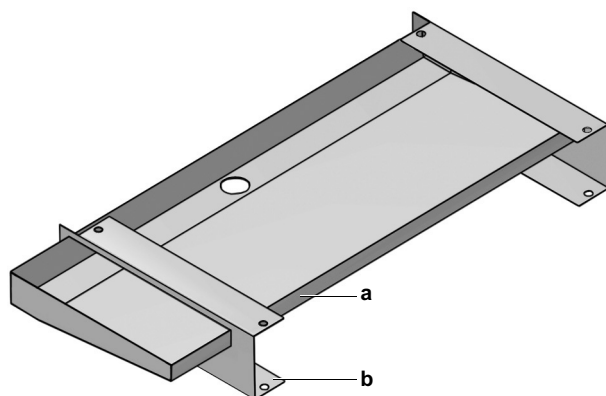
- If you install the unit on a frame, install a waterproof plate within 150 mm of the underside of the unit in order to prevent the invasion of water in the unit and to avoid the drain water dripping (see the following illustration).



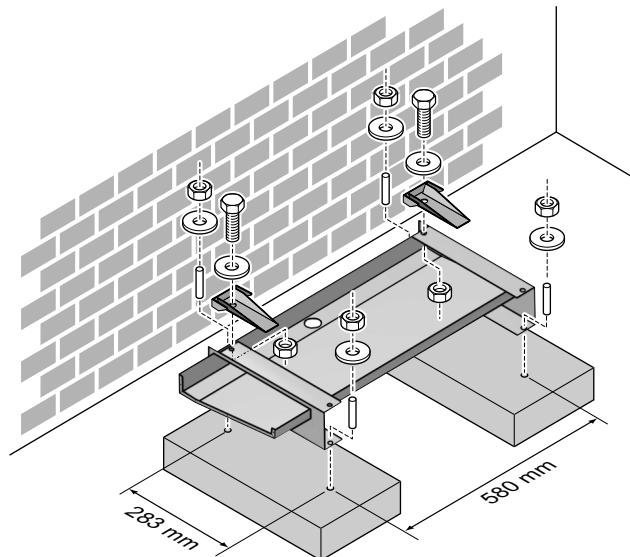
NOTICE

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

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



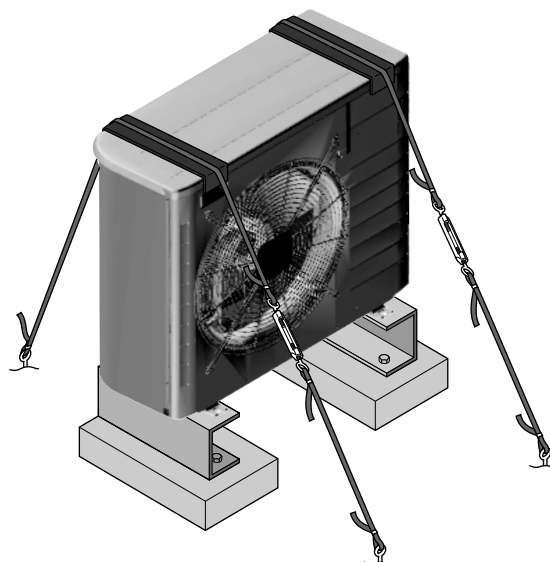
a Drain pan
b U-beams



7.2.4 To prevent the outdoor unit from falling over

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

- 1 Prepare 2 cables as indicated in the following illustration (field supply).
- 2 Place the 2 cables over the outdoor unit.
- 3 Insert a rubber sheet between the cables and the outdoor unit to prevent the cable from scratching the paint (field supply).
- 4 Attach the cable's ends. Tighten those ends.



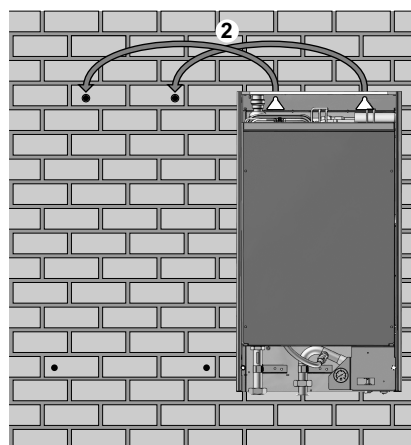
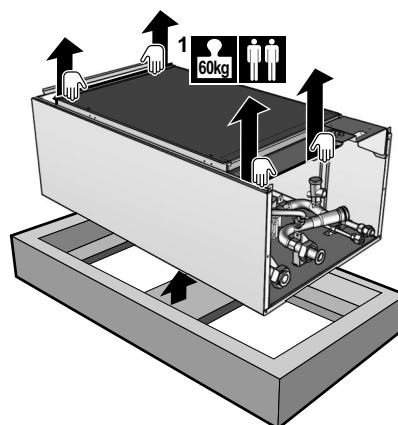
7.3 Mounting the indoor unit

7.3.1 To install the indoor unit



CAUTION

Do NOT grasp the piping to lift the indoor unit.



7.3.2 To install the drain pan kit

If a drain pan kit (EKHBDFCA2) is required, install it before connecting the refrigerant and water pipes and the electrical wiring. To install, see the installation manual of the drain pan kit.

7.4 Connecting the refrigerant piping



DANGER: RISK OF BURNING



CAUTION

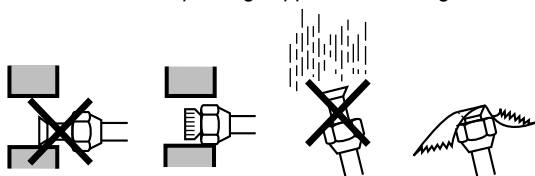
- Do NOT use mineral oil on flared part.
- Do NOT reuse piping from previous installations.
- NEVER install a drier to this R410A unit to guarantee its lifetime. The drying material may dissolve and damage the system.



NOTICE

Take the following precautions on refrigerant piping into account:

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



- Protect the piping as described in the following table to prevent dirt, liquid or dust from entering the piping.

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

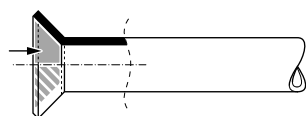


INFORMATION

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

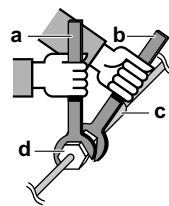
Take the following guidelines into account when connecting pipes:

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



- Always use two wrenches together when loosening a flare nut.

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



- a Torque wrench
- b Spanner
- c Piping union
- d Flare nut

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

7.4.1 Pipe bending guidelines

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

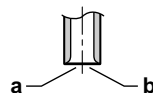
7.4.2 To flare the pipe end



CAUTION

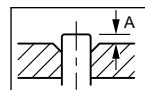
- Incomplete flaring may cause refrigerant gas leakage.
- Do NOT re-use flares. Use new flares to prevent for refrigerant gas leakage.
- Use flare nuts that are included with the unit. Using different flare nuts may cause to refrigerant gas leakage.

- 1 Cut the pipe end with a pipe cutter.
- 2 Remove burrs with the cut surface facing downward so that the chips does not enter the pipe.



- a Cut exactly at right angles.
- b Remove burrs.

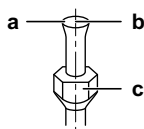
- 3 Remove the flare nut from the stop valve and put the flare nut on the pipe.
- 4 Flare the pipe. Set exactly at the position as shown in the following illustration.



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

7 Installation

- 5 Check that the flaring is properly made.

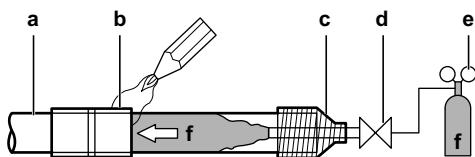


- a Flare's inner surface must be flawless.
- b The pipe end must be evenly flared in a perfect circle.
- c Make sure the flare nut is lifted.

7.4.3 To braze the pipe end

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

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



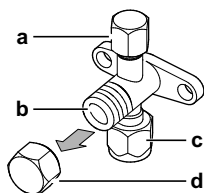
- a Refrigerant piping
- b Part to be brazed
- c Taping
- d Manual valve
- e Pressure-reducing valve
- f Nitrogen

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

7.4.4 To handle the stop valve

Take the following guidelines into account:

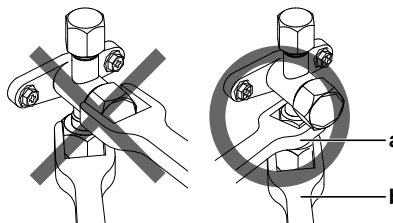
- The stop valves are factory closed.
- The following illustration shows each part required in handling the valve.



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

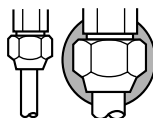
- Keep both stop valves open during operation.
- Do NOT apply excessive force to the valve stem. Doing so may break the valve body.

- Always make sure to secure the stop valve with a spanner, then loosen or tighten the flare nut with a torque wrench. Do NOT place the spanner on the stem cap, as this could cause a refrigerant leak.



- a Spanner
- b Torque wrench

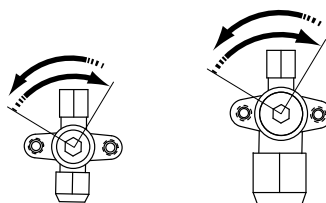
- When it is expected that the operating pressure will be low (e.g. when cooling will be performed while the outside air temperature is low), sufficiently seal the flare nut in the stop valve on the gas line with silicon sealant to prevent freezing.



Silicon sealant, make sure there is no gap.

7.4.5 To open/close the stop valve

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



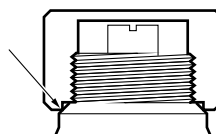
Counterclockwise to open.
Clockwise to close.

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

7.4.6 To handle the stem cap

Take the following guidelines into account:

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



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

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

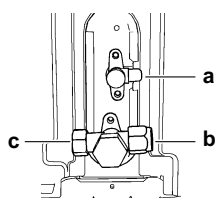
7.4.7 To handle the service cap

Take the following guidelines into account:

- Always use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, tighten the service port cap securely. For the tightening torque, refer to the table in chapter "7.4.6 To handle the stem cap" on page 31.
- Check for refrigerant leaks after tightening the service port cap.

7.4.8 To connect the refrigerant piping to the outdoor unit

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

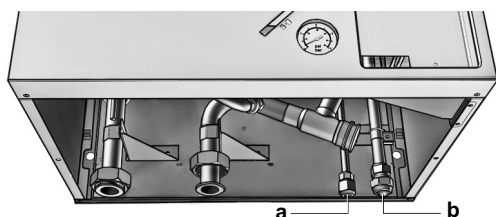


- a Liquid stop valve
- b Gas stop valve
- c Service port

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

7.4.9 To connect the refrigerant piping to the indoor unit

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



- a Refrigerant liquid connection
- b Refrigerant gas connection

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



NOTICE

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

7.4.10 About checking the refrigerant piping

Checking the refrigerant piping typically consists of:

- 1 Checking for leaks.
- 2 Performing vacuum drying.



NOTICE

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



NOTICE

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



NOTICE

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

Keep in mind the following guidelines:

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

7.4.11 To check for leaks



NOTICE

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

- 1 Charge the system with nitrogen gas up to a gauge pressure of at least 200 kPa (2 bar).
- 2 Check for leaks by applying the bubble test solution to all connections.
- 3 Discharge all nitrogen gas.



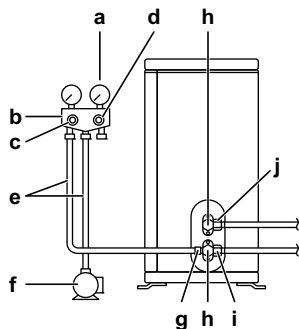
INFORMATION

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

7 Installation

7.4.12 To perform vacuum drying

Connect the vacuum pump and manifold as follows:



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

- Vacuum the system until the pressure on the manifold indicates -0.1 MPa (-1 bar).
- Leave as is for 4-5 minutes and check the pressure:

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

- Evacuate for at least 2 hours to a pressure on the manifold of -0.1 MPa (-1 bar).
- After turning OFF the pump, check the pressure for at least 1 hour.
- If you do NOT reach the target vacuum or cannot maintain the vacuum for 1 hour, do the following:
 - Check for leaks again.
 - Perform vacuum drying again.



NOTICE

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

7.4.13 To determine the additional refrigerant amount

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

7.4.14 To calculate the complete recharge amount



INFORMATION

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

7.4.15 To charge refrigerant



WARNING

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



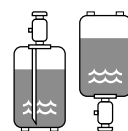
CAUTION

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

Other guidelines:

- Only use tools exclusively for R410A to ensure pressure resistance and to prevent foreign materials from entering into the system.
- Check whether the refrigerant cylinder is equipped with a siphon tube (the marking "liquid filling siphon attached" should be present).

Charge the liquid refrigerant with the cylinder in upright position.



Charge the liquid refrigerant with the cylinder in up-side-down position.

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

- Connect the refrigerant cylinder to the service port.
- Charge the additional refrigerant amount.
- Open the gas stop valve.

If pump down is needed in case of dismantling or relocate the system, see "13.1 To pump down" on page 71 for more details.

7.4.16 To fix the fluorinated greenhouse gases label



NOTICE

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

- Fill in the label as follows:

- From the multilingual fluorinated greenhouse gases label peel off the applicable language and stick it on top of a.
 - Factory refrigerant charge: see unit name plate
 - Additional refrigerant amount charged
 - Total refrigerant charge
- Fix the label on the inside of the outdoor unit near the gas and liquid stop valves.

7.5 Connecting the water piping

7.5.1 To connect the water piping

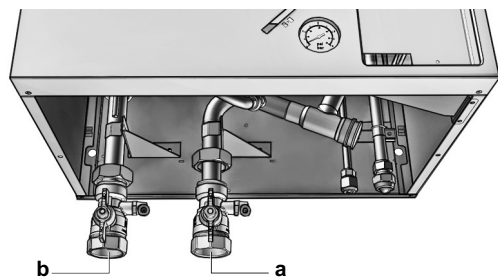


NOTICE

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

To facilitate service and maintenance, 2 shut-off valves are provided. Mount the valves on the water inlet and on the water outlet. Mind their the position. Orientation of the integrated drain valves is important for servicing.

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



a Water inlet
b Water outlet



NOTICE

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

- 2 Screw the indoor unit nuts on the shut-off valves.
- 3 Connect the field piping on the shut-off valves
- 4 In case of connection with the optional domestic hot water tank, see the installation manual of the domestic hot water tank.

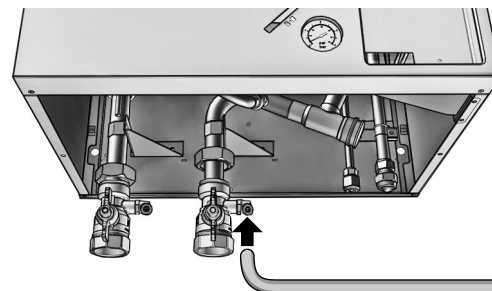


NOTICE

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

7.5.2 To fill the water circuit

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



- 2 Open the drain and fill valve.
- 3 Make sure that the automatic air purge valve is open (at least 2 turns).



INFORMATION

For location of the air purge valve, see Components: Indoor unit.

- 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 To perform an air purge. This function should be used to purge the heat exchanger coil of the domestic hot water tank.

- 6 Close the drain and fill valve.
- 7 Disconnect the water supply hose from the drain and fill valve.



NOTICE

The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature).
However, at all times water pressure shall remain above 1 bar to avoid air entering the circuit.

7.5.3 To fill the domestic hot water tank

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

7.5.4 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.

7.6 Connecting the electrical wiring



DANGER: RISK OF ELECTROCUTION



INFORMATION

More information about the legend and the location of the wiring diagram of the unit can be found in Wiring diagram.

7 Installation

7.6.1 About electrical compliance

Only for ERLQ006CAV3+ERLQ008CAV3

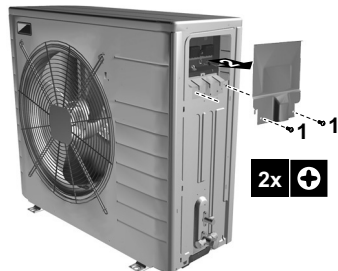
Equipment complying with EN/IEC 61000-3-12 (European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.).

Only for indoor units

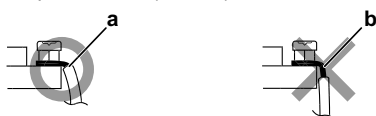
See "7.6.5 To connect the backup heater power supply" on page 37.

7.6.2 To connect the electrical wiring on the outdoor unit

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

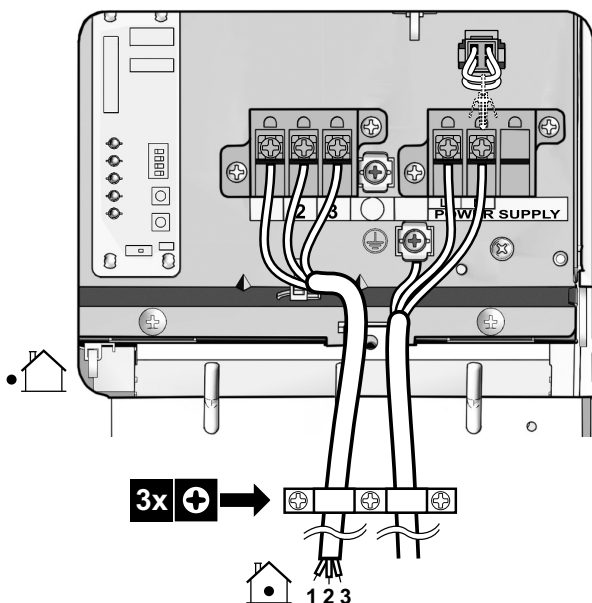


- 3 Strip insulation (20 mm) from the wires.



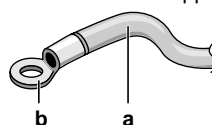
a Strip wire end to this point
Excessive strip length may cause electrical shock or leakage.

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



- 6 Install the switch box cover.

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



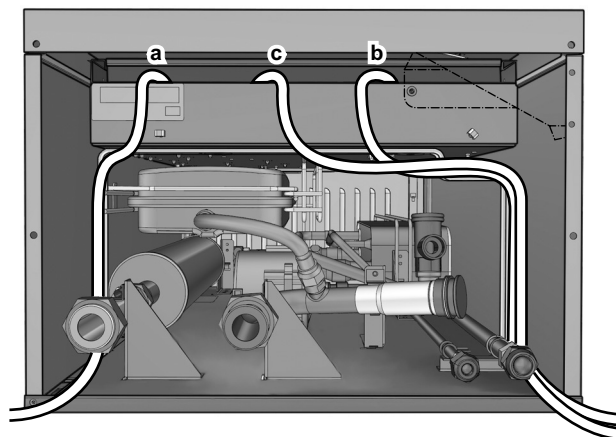
a Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

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

7.6.3 To connect the electrical wiring on the indoor unit

- 1 To open the indoor unit, see To open the indoor unit.
- 2 Wiring should enter the unit from the bottom.
- 3 Routing of the wiring inside the unit should be as follows:



Routing	Possible cables (depending on unit type and installed options)
a Low voltage	<ul style="list-style-type: none"> ■ User interface ■ Domestic hot water tank thermistor (option) ■ Power consumption digital inputs (field supply) ■ Outdoor ambient temperature sensor (option) ■ Indoor ambient temperature sensor (option) ■ Electrical meters (field supply)
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) ■ Power supply for booster heater (to indoor unit) ■ Power supply for booster heater and thermal protection (from indoor unit)
c High voltage control signal	<ul style="list-style-type: none"> ■ Preferential power supply contact ■ Heat pump convactor (option) ■ Room thermostat (option) ■ 3-way valve ■ Shut-off valve (field supply) ■ Domestic hot water pump (field supply) ■ Alarm output ■ Changeover to external heat source control ■ Space heat/cool operation control

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

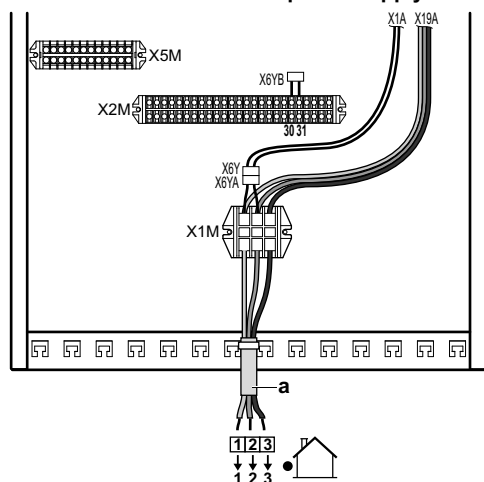
**CAUTION**

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

7.6.4 To connect the main power supply

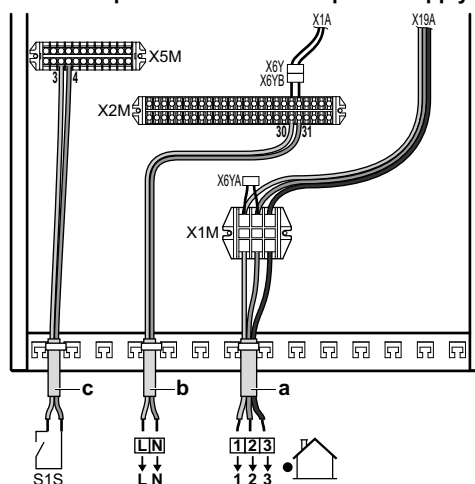
- 1 Connect the main power supply.

In case of normal kWh rate power supply



Legend: see illustration below.

In case of preferential kWh rate power supply



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

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

7 Installation

7.6.5 To connect the backup heater power supply



CAUTION

If the indoor unit has a tank with a built-in electrical booster heater (EKHW*), use a dedicated power circuit for the backup heater and booster heater. NEVER use a power circuit shared by another appliance. This power circuit must be protected with the required safety devices according to the applicable legislation.

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	—

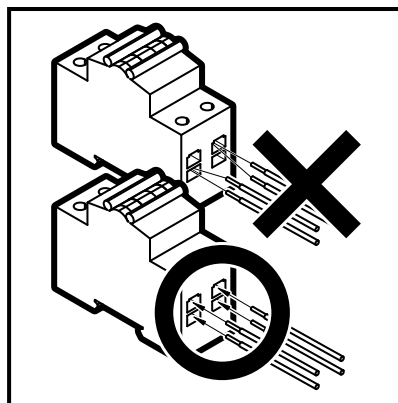
- (a) Equipment complying with EN/IEC 61000-3-12 (European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.).
- (b) This equipment complies with EN/IEC 61000-3-11 (European/International 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)		
6 kW 3N~ 400 V (*9W) 9 kW 3N~ 400 V (*9W)		

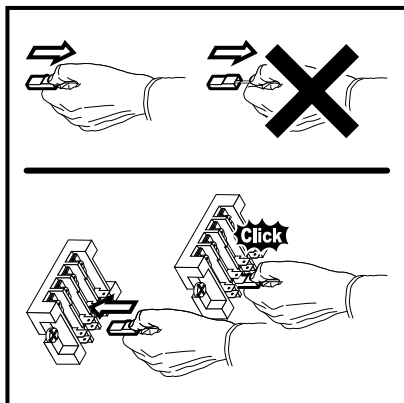
(a) For configuration of the backup heater, see Quick wizard: Standard.

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.

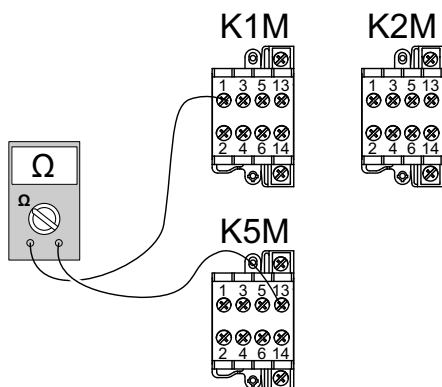


- 2 Fix the cable with cable ties to the cable tie mountings.
- 3 Configure the user interface for the respective power supply. See Quick wizard: Standard.

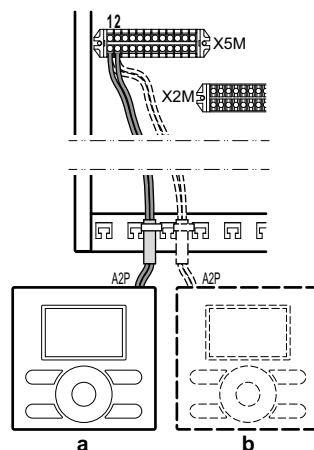
During connection of the backup heater, miswiring is possible. To detect possible miswiring, it is highly recommended to measure the resistance value of the heater elements. Depending on the different backup heater types, following resistance values (see table below) should be measured. ALWAYS measure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

**7.6.6 To connect the user interface**

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

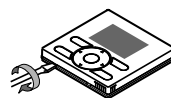


- a User interface delivered with the unit
b Optional user interface

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

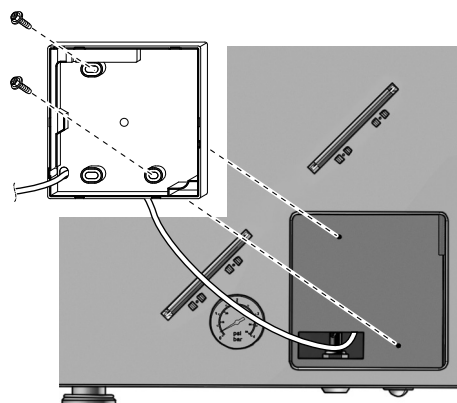
Fixation of the user interface to the indoor unit

- 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.

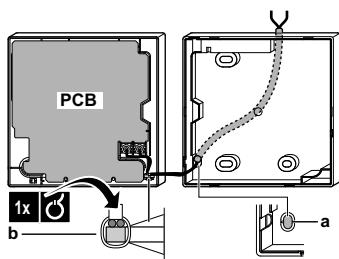
**NOTICE**

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.

7 Installation

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.

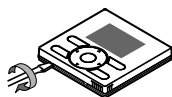


NOTICE

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

Fixation of 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.

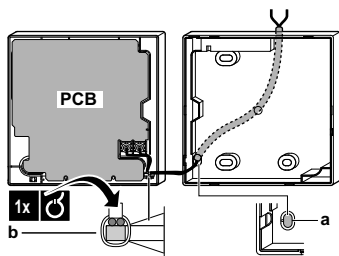


NOTICE

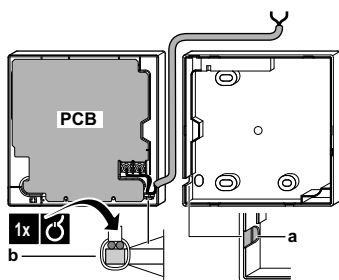
The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.

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

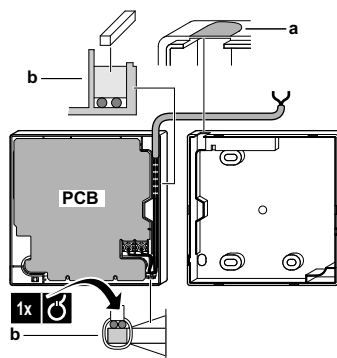
From the rear



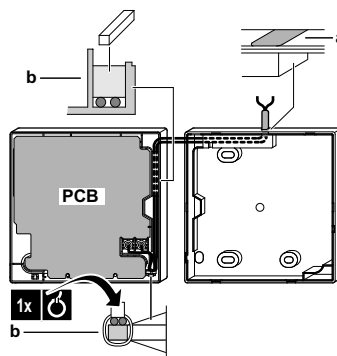
From the left



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.

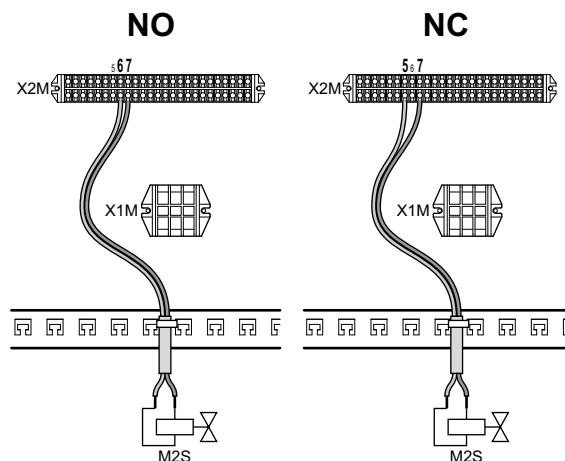
7.6.7 To connect the shut-off valve

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



NOTICE

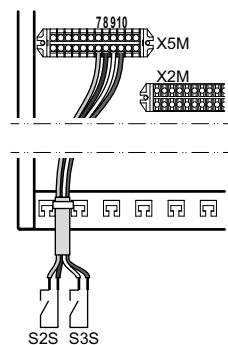
Wiring is different for a NC (normal closed) valve and a NO (normal open) valve.



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

7.6.8 To connect the electrical meters

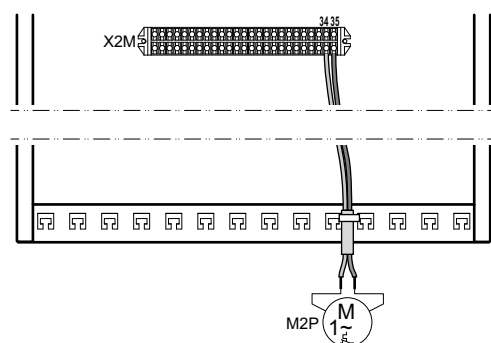
- 1 Connect the electrical meters cable to the appropriate terminals as shown in the illustration below.



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

7.6.9 To connect the domestic hot water pump

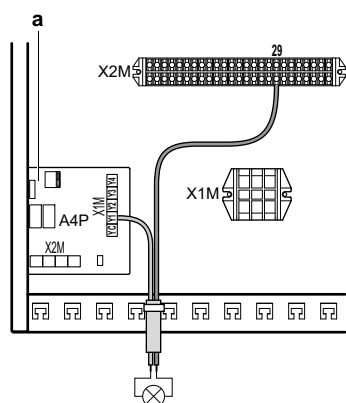
- 1 Connect the domestic hot water pump cable to the appropriate terminals as shown in the illustration below.



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

7.6.10 To connect the alarm output

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

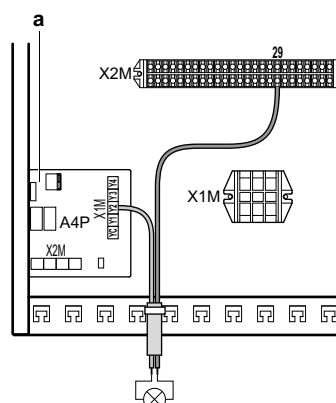


a Installation of EKR1HB is required.

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

7.6.11 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.

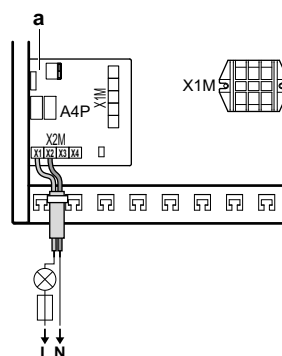


a Installation of EKR1HB is required.

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

7.6.12 To connect the changeover to external heat source

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

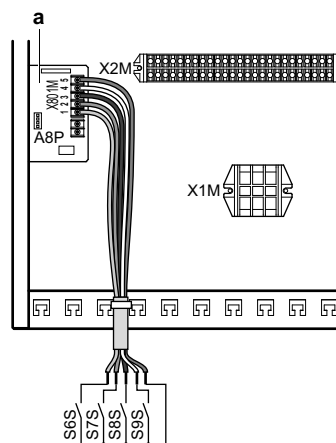


a Installation of EKR1HB is required.

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

7.6.13 To connect the power consumption digital inputs

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



a Installation of EKR1AHTA is required.

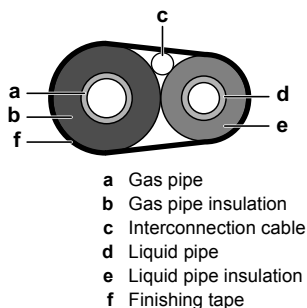
- 2 Fix the cable with cable ties to the cable tie mountings.

8 Configuration

7.7 Finishing the outdoor unit installation

7.7.1 To finish the outdoor unit installation

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



- 2 Install the service cover.

7.7.2 To close the outdoor unit

- 1 Close the switch box cover.
- 2 Close the service cover.



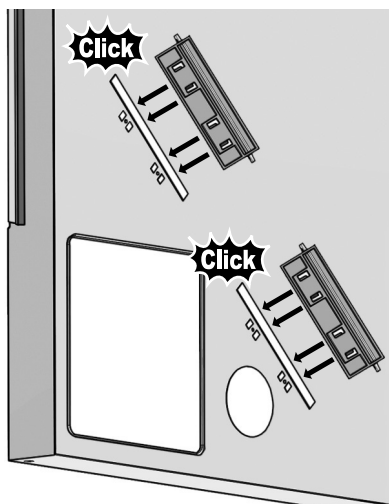
NOTICE

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

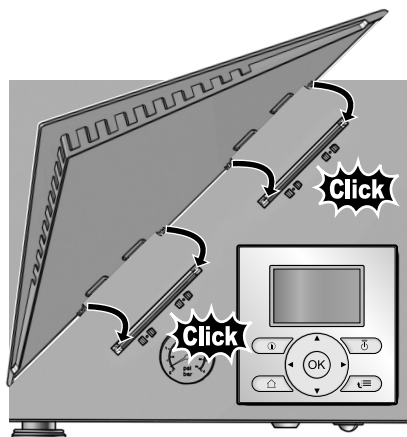
7.8 Finishing the indoor unit installation

7.8.1 To fix the user interface cover to the indoor unit

- 1 Make sure that the front panel is removed from the indoor unit. See To open the indoor unit.
- 2 Plug the hinges into the backside of the front panel.



- 3 Plug the user interface cover into the hinges.



- 4 Mount the front panel to the indoor unit.

7.8.2 To close the indoor unit

- 1 Close the switch box cover.
- 2 Reinstall the 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 42 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.

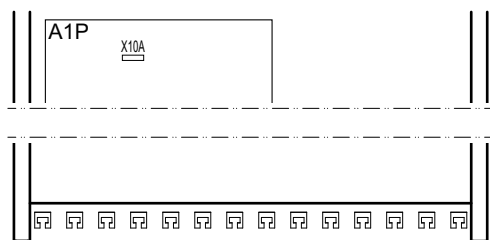
The most commonly used installation settings are accessible through the menu structure. Their location is mentioned by the breadcrumb indication (#). Additionally, all installer settings can also be found in Menu structure: Installer settings.

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

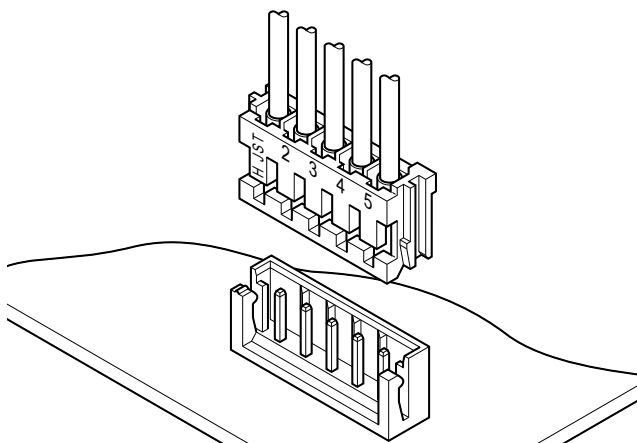
Not all settings are accessible through the menu structure. Some are only accessible through their code. Then in the table explained below, the bread crumb is set as N/A (not applicable).

8.1.1 To connect the PC cable to the switch box

- 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.

To switch between user permission levels (End user and Extended end user)

- 1 Go to [6] or any of its submenus: > Information.
- 2 Press for more than 5 seconds.

Result: The user permission level switches to Adv. end user. Additional information is displayed and "+" is added to the menu title.

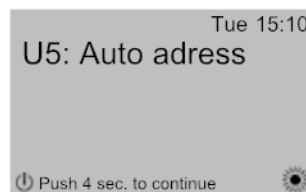
- 3 If you do NOT press any button for more than 1 hour or press again for more than 5 seconds, the user permission level switches back to End user.

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:



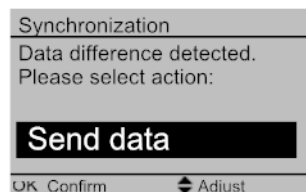
- 2 Push for 4 sec. on the user interface on which you want to proceed to the quick wizard.



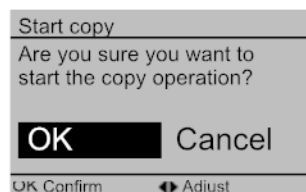
INFORMATION

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

- 3 The quick wizard will guide you (see Quick wizard)
- 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 Configuration

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 42.

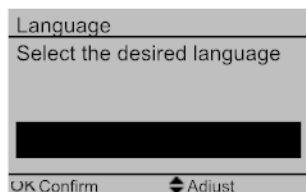
8.1.5 Quick wizard: Set the system layout after first power ON

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

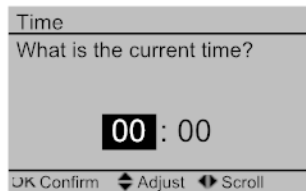
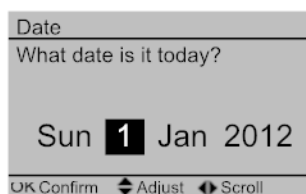
- language,
- date,
- time,
- system layout.

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

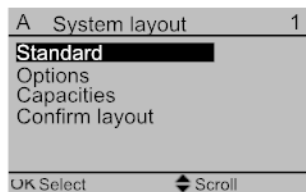
- 1 At power ON, the quick wizard starts as long as the system layout was NOT confirmed yet, by setting the language.



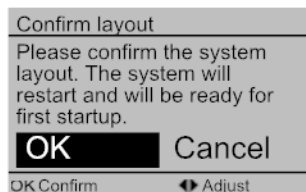
- 2 Set the current date and time.



- 3 Set the system layout settings: Standard, Options, Capacities. For more details, see Basic configuration.



- 4 Confirm by pressing **OK**.



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

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

8.2 Basic configuration

8.2.1 Quick wizard: Language / time and date

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

8.2.2 Quick wizard: Standard

Backup heater configuration (only for *9W model)

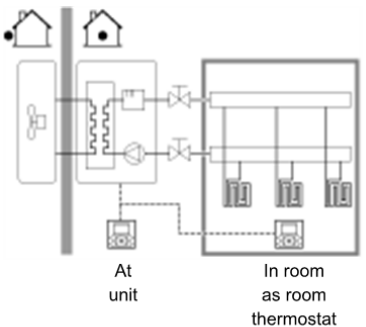
The backup heater in a *9W model is adapted to be connected to most common European electricity grids. Besides hardware configuration, the backup heater type must be set on the user interface.

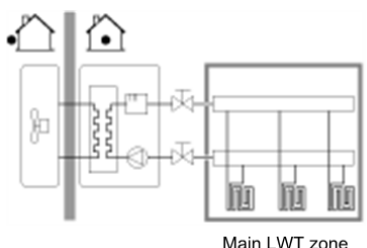
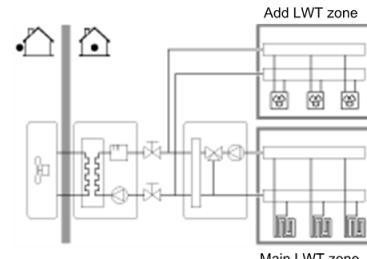
#	Code	Description
[A.2.1.5]	[5-0D]	BUH type: <ul style="list-style-type: none">■ 1 (1P,(1/1+2)): 3 kW 1~ 230 V (*9W)■ 3 (3P,(1/1+2)): 6 kW 3~ 230 V (*9W)■ 4 (3PN,(1/2)): 6 kW 3N~ 400 V (*9W)■ 5 (3PN,(1/1+2)): 9 kW 3N~ 400 V (*9W)

Space heating/cooling settings

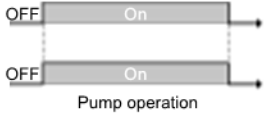
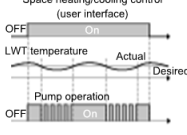
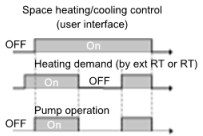
The system can heat up or cool down a space. Depending on the type of application, the space heating/cooling settings must be made accordingly.

#	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.

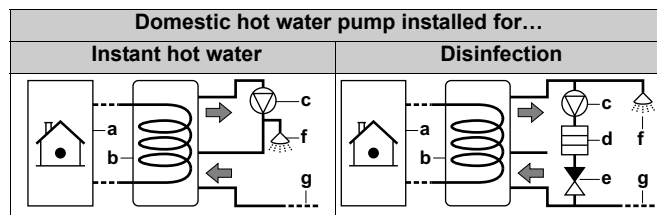
#	Code	Description
[A.2.1.B]	N/A	<p>Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):</p>  <p>At unit</p> <p>In room as room thermostat</p> <p>User interface location:</p> <ul style="list-style-type: none"> ■ At unit: the other user interface is automatically 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]	<p>The system can supply leaving water to up to 2 water temperature zones. During configuration, the number of water zones must be set.</p> <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.  <p>Main LWT zone</p> <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.  <p>Add LWT zone</p> <p>Main LWT zone</p>

8 Configuration

#	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. <p>Space heating/cooling control (user interface)</p>  <ul style="list-style-type: none"> 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. <p>Space heating/cooling control (user interface)</p>  <ul style="list-style-type: none"> 2 (Request): Pump operation based on request. Example: Using a room thermostat creates thermo ON/OFF condition. When there is no such demand, the pump is OFF. Remark: Request is NOT available in leaving water temperature control. <p>Space heating/cooling control (user interface)</p> 

#	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.
[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 9.

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.2.2.4]	[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 9.</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 (FWVX). ■ 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.
[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 9.</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 9.</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 9.

#	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 9.
[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 9.
[A.2.2.6.3]	[C-09]	<p>Alarm output</p> <p>Indicates the logic of the alarm output on the digital I/O PCB during malfunctioning.</p> <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]	<p>Bottom plate heater</p> <p>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.</p> <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 9.

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Demand PCB

The demand PCB is used to enable the power consumption control by digital inputs. See "5 Application guidelines" on page 9.

#	Code	Description
[A.2.2.7]	[D-04]	Ext. backup heat src 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)
[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)

#	Code	Description
[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 ■ *9V: 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)

8.2.4 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)

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: <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 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>■ T_t: Target leaving water temperature (main)</p> <p>■ T_a: Outdoor temperature</p> <p>■ [1-00]: Low outdoor ambient temperature. $-20^{\circ}\text{C} \sim 5^{\circ}\text{C}$ (default: -10°C)</p> <p>■ [1-01]: High outdoor ambient temperature. $10^{\circ}\text{C} \sim 20^{\circ}\text{C}$ (default: 15°C)</p> <p>■ [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: 40°C). Note: This value should be higher than [1-03] as for low outdoor temperatures warmer water is required.</p> <p>■ [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>

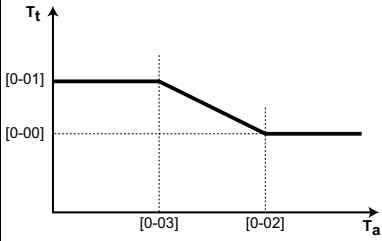
8 Configuration

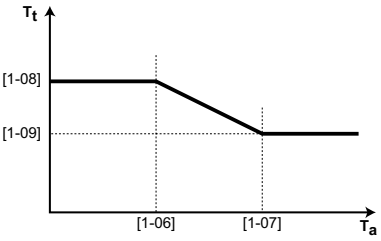
#	Code	Description
[A.3.1.1.4]	[1-06] [1-07] [1-08] [1-09]	<p>Set weather-dependent cooling:</p> <ul style="list-style-type: none"> ■ T_t: Target leaving water temperature (main) ■ T_a: Outdoor temperature ■ [1-06]: Low outdoor ambient temperature. 10°C~25°C (default: 20°C) ■ [1-07]: High outdoor ambient 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 (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 (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]	[0-03] [0-02] [0-01] [0-00]	<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 (default: 40°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 (default: 25°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]	[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. $10^{\circ}\text{C} \sim 25^{\circ}\text{C}$ (default: 20°C) ■ [1-07]: High outdoor ambient temperature. $25^{\circ}\text{C} \sim 43^{\circ}\text{C}$ (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 (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 (default: 18°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).

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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]	To configure the desired tank temperature. Setpoint mode: <ul style="list-style-type: none"> ■ Reheat only: Only reheat operation is allowed. Note: Avoid using this setting in case of a domestic hot water tank without internal booster heater (risk of capacity shortage between space heating and domestic hot water). ■ Reheat + sched.: The domestic hot water cylinder is reheated and also heated up through the schedule timer. ■ Scheduled only: The domestic hot water tank can be heated via a schedule.

See "8.3.2 Domestic hot water control: advanced" on page 55 for more details



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 real desired tank temperature and the number of people taking into account the installed tank size and the daily domestic hot water consumption of the customer. 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. <div style="text-align: center;">  </div> ■ 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.4.4.2]: Operation day. <div style="text-align: center;">  </div>
[A.4.3.2.1]	N/A	1 person The increment of the desired tank temperature for 2 persons compared to 1 person. 0~20°C (default: 4°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: 4°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: 4°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: 4°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: 4°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: 4°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: 80°C) (for EHBH in combination with EKHWH* cylinder) ■ [E-07]=1: 40~60°C (default: 60°C) (for EHVH in combination with EKHWH* cylinder) 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: 45°C)
[7.4.2.2]	[8-0A]	Eco (heating) [9-01]~[9-00] (default: 35°C)
[7.4.2.3]	[8-07]	Comfort (cooling) [9-03]~[9-02] (default: 15°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) -5~+5°C (default: 0°C)
[7.4.2.6]	N/A	Eco (heating) -5~+5°C (default: -3°C)
[7.4.2.7]	N/A	Comfort (cooling) -5~+5°C (default: 0°C)
[7.4.2.8]	N/A	Eco (cooling) [-5~+5°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.



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.

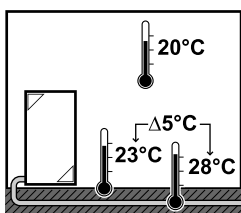
8 Configuration



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

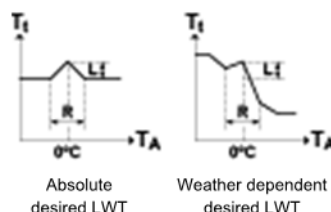
Leaving water temperature overshoot temperature

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).



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

Leaving water temperature maximum modulation

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

#	Code	Description
N/A	[8-06]	1~5°C (default: 3°C)

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)

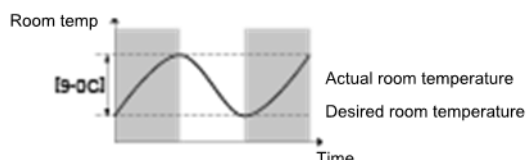
Room temperature step

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

#	Code	Description
[A.3.2.4]	[3-06]	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.



#	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 0.1°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 0.1°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 application guidelines). See "5 Application guidelines" on page 9.

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

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)(default): is NOT influenced by changing the space operation mode to cooling. 1 (Yes): closes when the space operation mode is cooling.

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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) The same setting is also used in automatic heating/cooling changeover.

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-012]	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 41).

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)
N/A	[4-0E]	Guard timer: Minimum time that the system runs in a certain space operation mode. This prevents too frequent changeover between heating and cooling mode. 0~120 minutes, step 15 minutes (default: 30 minutes)

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]	30~80°C (default: 45°C)

Reheat: The desired reheat tank temperature is used:

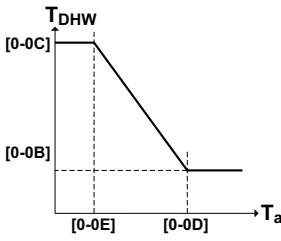
- in scheduled + reheat mode, as guaranteed minimum tank temperature: if the tank temperature drops below this value, the tank is heated up.
- during storage comfort, to prioritize the domestic hot water preparation. When the tank temperature raises above this value, domestic hot water preparation and 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	<p>Weather dependent desired tank temperature is:</p> <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. <p>Note: When the displayed tank temperature is weather dependent, it cannot be adjusted on the user interface.</p>

#	Code	Description
[A.4.2.3]	[0-0E] [0-0D] [0-0C] [0-0B]	<p>Weather-dependent curve</p>  <p>T_{DHW}: The desired tank temperature. T_a: The (averaged) outdoor ambient temperature</p> <ul style="list-style-type: none"> ■ [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 $T_a > 35^{\circ}\text{C}$, OR Domestic hot water temperature is 2°C lower than the heat pump OFF temperature. <p>The booster heater will be allowed to operate when $T_a < [5-03]$ independent 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: 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>
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>
N/A	[6-00]	<p>The temperature difference determining the heat pump ON temperature.</p>

#	Code	Description
N/A	[6-01]	<p>The temperature difference determining the heat pump OFF temperature.</p>

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>
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.
N/A	[8-02]	<p>Anti-recycling time. Minimum time between two cycles for domestic hot water. The actual anti-recycling time also depends on setting [8-04].</p>
N/A	[8-03]	<p>Booster heater delay timer. Only for EKHW* 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].
N/A	[8-04]	<p>Additional running time for the maximum running time depending on the outdoor temperature [4-02] or [F-01].</p>

Disinfection

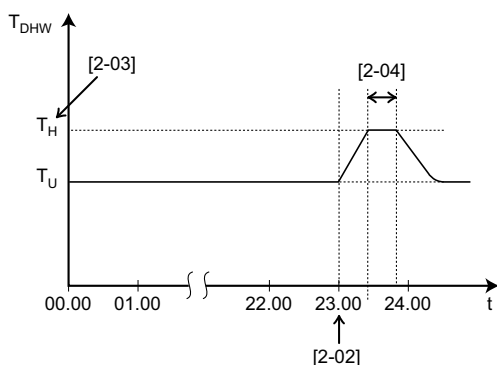
Applies only to installations with a domestic hot water tank.

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

**CAUTION**

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

#	Code	Description
[A.4.4.2]	[2-00]	Operation day: <input type="checkbox"/> Each day <input type="checkbox"/> Monday <input type="checkbox"/> Tuesday <input type="checkbox"/> Wednesday <input type="checkbox"/> Thursday <input type="checkbox"/> Friday <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday
[A.4.4.2]	[2-01]	Disinfection <input type="checkbox"/> No <input type="checkbox"/> Yes
[A.4.4.3]	[2-02]	Start time: 00~23:00, step: 1:00.
[A.4.4.4]	[2-03]	Temperature target: <input type="checkbox"/> With booster heater: 55~80°C, default: 70°C. <input type="checkbox"/> Without booster heater: 60°C (fixed).
[A.4.4.5]	[2-04]	Duration: <input type="checkbox"/> With booster heater: 5~60 minutes, default: 10 minutes. <input type="checkbox"/> Without booster heater: 40~60 minutes, default: 60 minutes.



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

**WARNING**

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

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

**CAUTION**

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

**INFORMATION**

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: <input type="checkbox"/> 0: Disabled <input type="checkbox"/> 1: Enabled <input type="checkbox"/> 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: <input type="checkbox"/> 1: Allowed <input type="checkbox"/> 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: <input type="checkbox"/> 1: Allowed <input type="checkbox"/> 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? <input type="checkbox"/> 1: NOT allowed <input type="checkbox"/> 0: Allowed
[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.

8 Configuration

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.

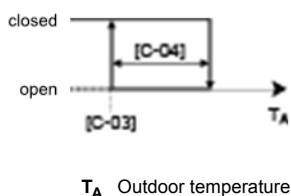
When the "bivalent operation" function is enabled, the indoor unit will stop automatically in space heating operation when the outdoor temperature drops below "bivalent ON temperature" and the permission signal for the auxiliary boiler becomes active.

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 disactivated.

- [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)



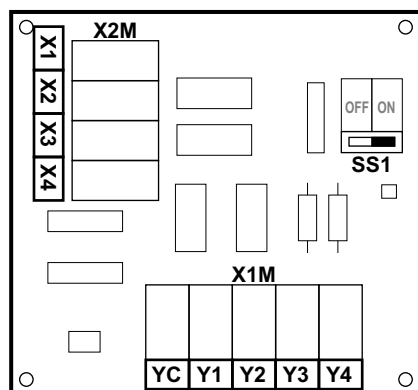
CAUTION

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 disactivated. See illustration below for the schematic location of this contact.



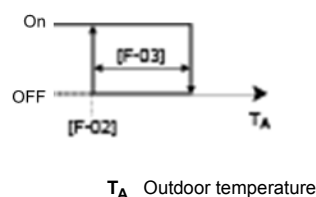
#	Code	Description
N/A	[C-03]	ON temperature. If the outdoor temperature drops below this temperature, the bivalent heat source permission signal will be active.
N/A	[C-04]	Hysteresis. Temperature difference between bivalent heat source ON and OFF to prevent too much switching.

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

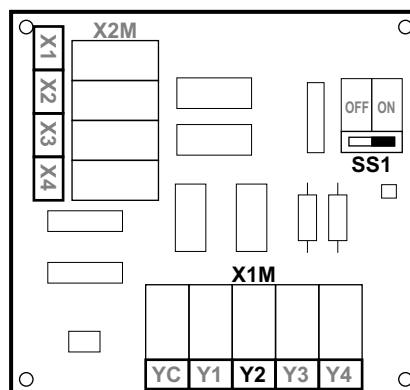
The bottom plate heater is controlled via EKR1HB.

#	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 wiring diagram.



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. ■ 0: disabled ■ 1: enabled [5-01] Equilibrium temperature and [5-03] Space heating priority temperature are related to backup heater. So, you must set [5-01] and [5-03] to the same value.
	[5-03]	Space heating priority temperature. Defines the outdoor temperature which below the domestic hot water will be heated by booster heater only.
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.
[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.

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 [5-01] and [5-03] to the same value. 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.

#	Code	Description
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.6.2.1]	[d-00]	Which heaters are allowed to operate during preferential kWh rate power supply? ■ 0 (default): None ■ 1: Booster heater only ■ 2: Backup heater only ■ 3: All heaters Only for EHBH + EKHV*: See table below. Only for EHVH: See table below. Settings 1, 2 and 3 are only meaningful if the preferential kWh rate power supply is of type 1 or indoor unit is connected to a normal kWh rate power supply (via 30-31 X2M) and the backup heater and booster heater are NOT connected to the preferential kWh rate power supply.

Only for EHBH + 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: Do NOT use 1 or 3.

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

8 Configuration

Power saving function

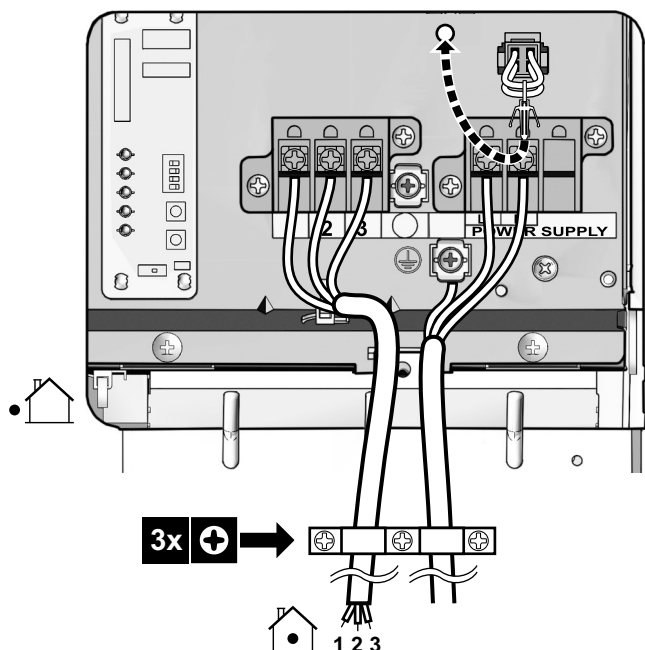


INFORMATION

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



#	Code	Description
N/A	[E-08]	Power saving function for outdoor unit: <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 9 for detailed information about this functionality.

Pwr consumpt. control

#	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.

#	Code	Description
[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]	N/A	Value: Only applicable in case of full time power limitation mode. 0~50 A, step 1 A (default: 50 A)
[A.6.3.4]	N/A	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*.		
[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.

Note: power consumption control only based on heater priority is possible for EHBH/X04+08 and EHVH/X04+08 models, but also for EHBH/X16CA and EHVH/X16 models. Hereto you can limit the operation of both electrical heaters (backup heater and booster heater) by the following setting.

#	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 ■ 12 hours ■ 24 hours ■ 48 hours ■ 72 hours

Offset temperature external outdoor ambient sensor



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

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

#	Code	Description
[A.6.5]	[2-0B]	-5~5°C, step 0.1°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? <ul style="list-style-type: none"> ■ 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.

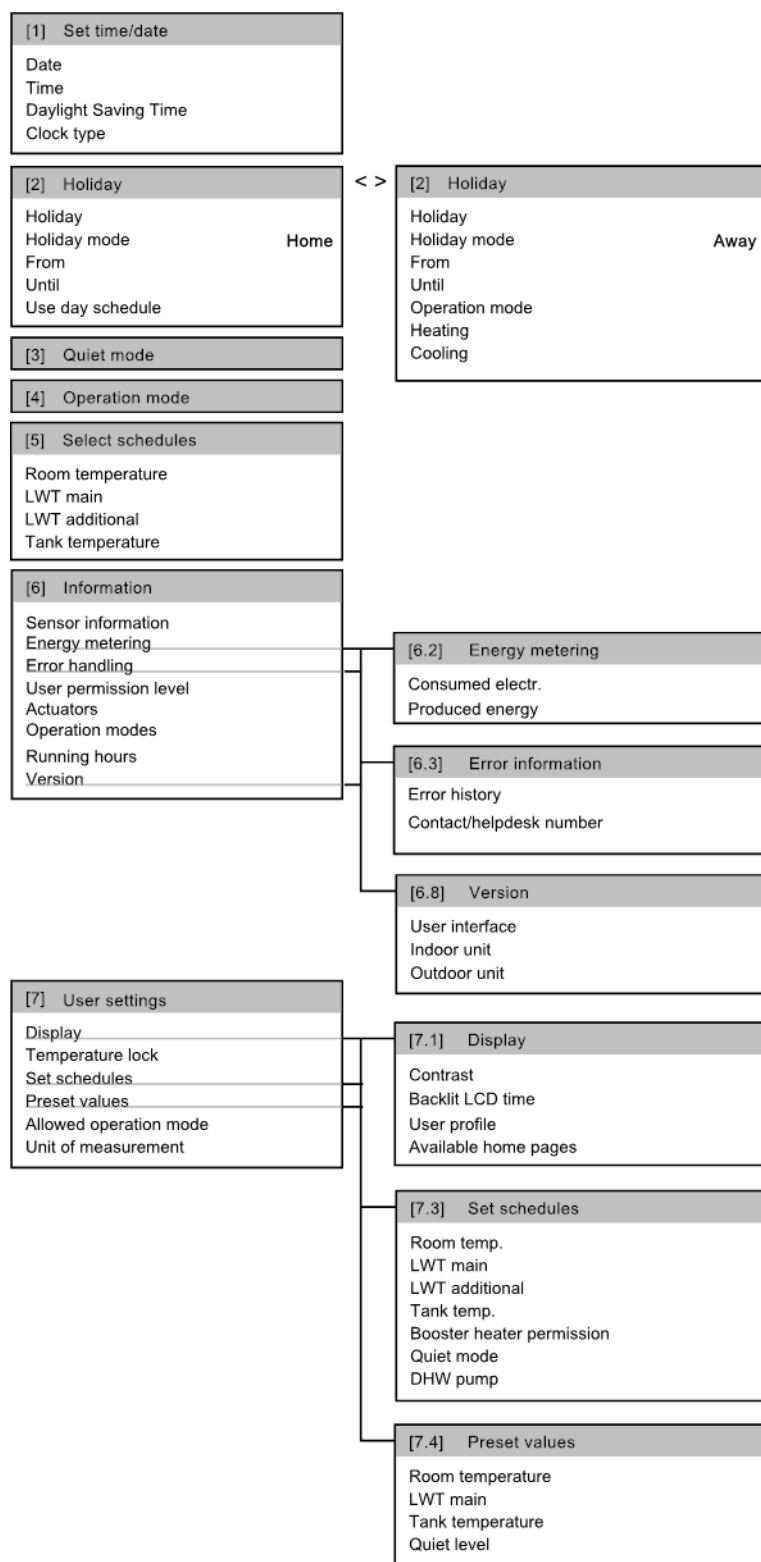
#	Code	Description
N/A	[F-00]	Pump operation: <ul style="list-style-type: none"> ■ 0: Disabled if outdoor temperature is higher than [4-02] or lower than [F-01] depending on heating/cooling operation mode. ■ 1: Possible at all outdoor temperatures.

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 deactivated after 10 minutes). Daikin shall NOT be held liable for any damage resulting this functionality.

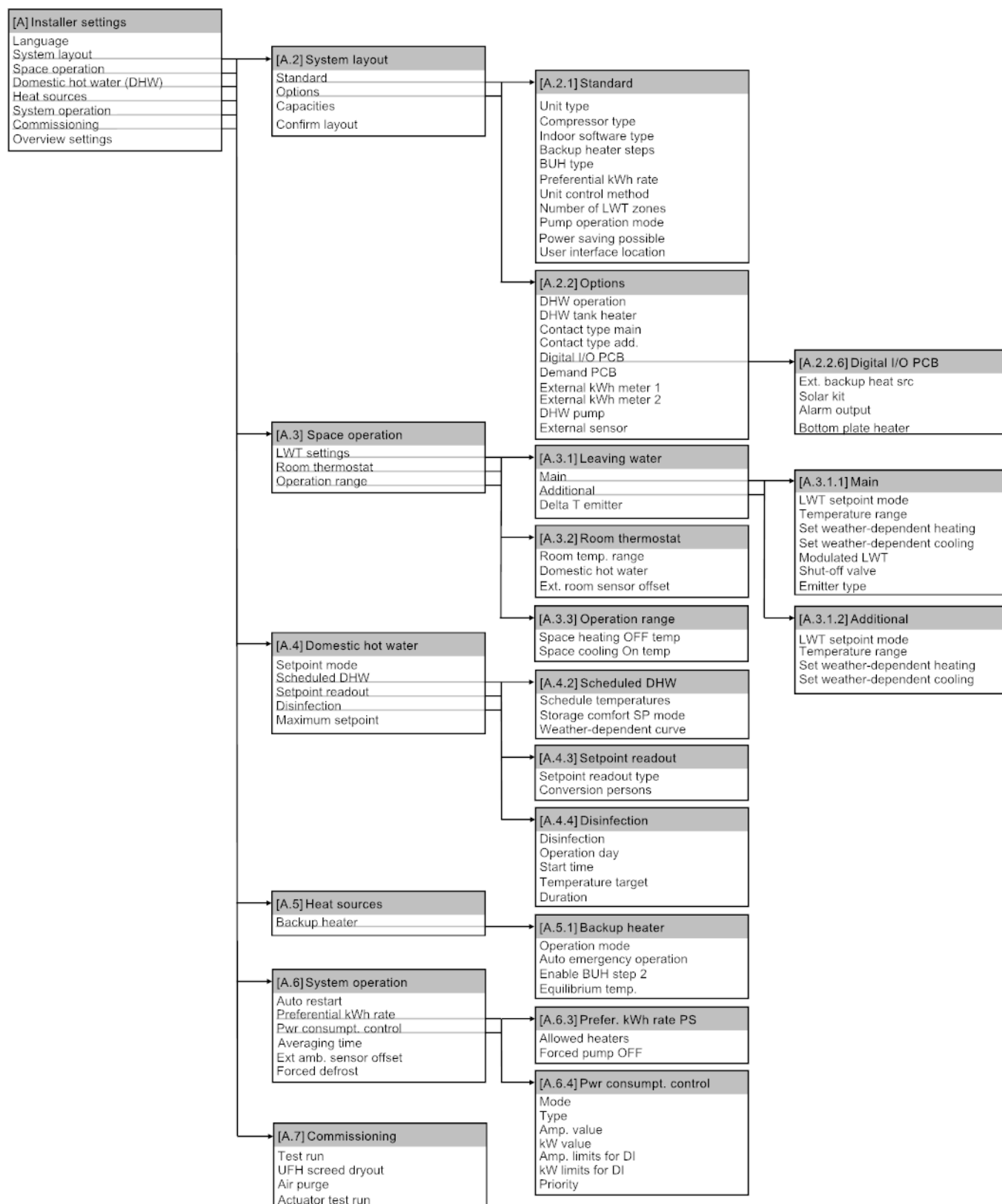
#	Code	Description
N/A	[F-09]	Pump continue operation when flow abnormality: <ul style="list-style-type: none"> ■ 0: Pump will be deactivated. ■ 1: Pump will be activated when $T_a < 4^\circ\text{C}$ (10 minutes ON – 10 minutes OFF)

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 that stated on the nameplate of the unit. This phenomenon originates from the compressor that needs to 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:

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

9.2 Checklist before test run

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

<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.



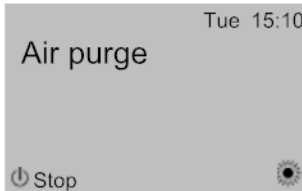
INFORMATION

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

- 1 Set the user permission level to Installer. See To set the user permission level to Installer.
- 2 Set the air purge mode: go to [A.7.3.1]  > Installer settings > Commissioning > Air purge > Type.
- 3 Select Manual and press **OK**.
- 4 Set the desired pump speed: go to [A.7.3.2]  > Installer settings > Commissioning > Speed.
- 5 Select the desired pump speed and press **OK**.
Result: Low
Result: High
- 6 If applicable, select the desired position of the 3-way valve. If not applicable, go to [A.7.3.4].
- 7 Set the desired position of the 3-way valve: go to [A.7.3.3]  > Installer settings > Commissioning > Air purge > Circuit.
- 8 Select the desired circuit and press **OK**.
Result: SHC
Result: Tank
- 9 Go to [A.7.3.4]  > Installer settings > Commissioning > Air purge > Start air purge and press **OK** to start the air purge function.

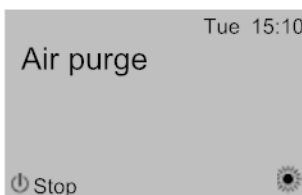
Result: Air purging is started and following screen will be shown.



9.3.2 To perform an automatic air purge

- 1 Set the user permission level to Installer. See To set the user permission level to Installer.
- 2 Set the air purge mode: go to [A.7.3.1] > Installer settings > Commissioning > Air purge > Type.
- 3 Select Automatic and press **OK**.
- 4 Go to [A.7.3.4] > Installer settings > Commissioning > Air purge > Start air purge and press **OK** to start the air purge function.

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



9.3.3 To interrupt air purge

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

9.4 To perform a test run

- 1 Go to [A.7.1]: > Installer settings > Commissioning > Test run.
- 2 Select a test and press **OK**.
Example: Heating.
- 3 Select OK and press **OK**.

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



INFORMATION

If 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).

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

- 2 Go to [A.7.4]: > Installer settings > Commissioning > Actuator test run.
- 3 Select an actuator and press **OK**.
Example: Pump.
- 4 Select OK and press **OK**.

Result: The actuator test run starts. It 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

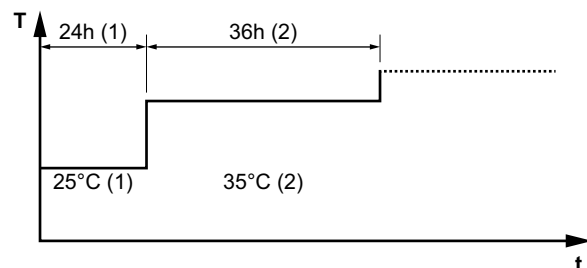
The installer is responsible to:

- 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:

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

Example:



T Desired leaving water temperature (15~55°C)

t Duration (1~72h)

(1) Action step 1

(2) Action step 2

10 Hand-over to the user

9.6.1 To program an underfloor heating screed dryout schedule

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



INFORMATION

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

9.6.2 To start an underfloor heating screed dryout

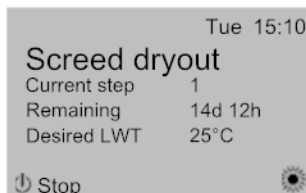


INFORMATION

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

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

Result: The underfloor heating screed dryout starts and following screen will be shown. It stops automatically when done. To stop it manually, press , select OK and press **OK**.



9.6.3 To readout the status of an underfloor heating screed dryout

- 1 Press .
- 2 The current step of the program, the total remaining time, and the current desired leaving water temperature will be displayed.



INFORMATION

There is limited access to the menu structure. Only the following 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 "12.4 Solving problems based on error codes" on page 70. To reset the U3 error, your User permission level needs to be Installer.

- 1 Go to the underfloor heating screed dryout screen.
- 2 Press .
- 3 Press to interrupt the program.
- 4 Select OK and press **OK**.

Result: The underfloor heating screed dryout program is stopped.

When the program is stopped due to an error, an operation switch off, or a power failure, you can read out the underfloor heating screed dryout status.

- 5 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout > Dryout status > Stopped at and followed by the last executed step.
- 6 Modify and restart the execution of the program.

10 Hand-over to the user

Once the test run is finished and the unit operates properly, please make sure the following is clear for the user:

- Fill in the installer setting table (in the operation manual) with the actual settings.
- Make sure that the user has the CD 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 Overview: Maintenance

11.2 Maintenance safety precautions



DANGER: RISK OF ELECTROCUTION



DANGER: RISK OF BURNING



NOTICE Risk of electrostatic discharge

Before performing any maintenance or service work, touch a metal part of the unit in order to eliminate static electricity and to protect the PCB.

11.2.1 Opening the indoor unit

See "7.1.3 To open the switch box cover of the indoor unit" on page 27.

11.3 Checklist for yearly maintenance for indoor unit

Check the following at least once a year:

- Water pressure
- Water filter
- Water pressure relief valve
- Pressure relief valve of the domestic hot water tank
- Switch box
- Booster heater of the domestic hot water tank

Water pressure

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

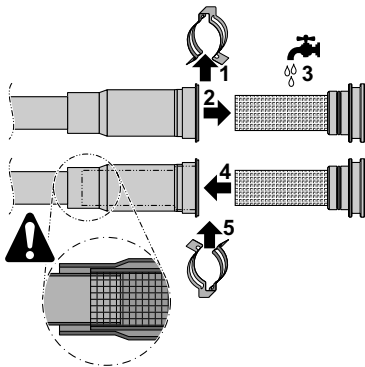
Water filter

Clean the water filter.



NOTICE

Handle the water filter with care. Do NOT use excessive force when you reinsert the water filter so as NOT to damage the water filter mesh.



Water pressure relief valve

Open the valve and check 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.

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.

Booster heater of the domestic hot water tank



INFORMATION

Only for wall-mounted units equipped with a domestic hot water tank with a built-in electrical booster heater (EKHW*).

It is advisable to remove lime buildup on the booster heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the booster heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

12 Troubleshooting

12.1 Overview: Troubleshooting

12.2 General guidelines

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



WARNING

- When carrying out an inspection on the switch box of the unit, always make sure that the unit is disconnected from the mains. Turn off the respective circuit breaker.
- When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. NEVER bridge safety devices or change their values to a value other than the factory default setting. If you are unable to find the cause of the problem, call your dealer.



DANGER: RISK OF ELECTROCUTION



WARNING

Prevent hazard due to the inadvertent resetting of the thermal cut-out: this appliance must NOT be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly turned ON and OFF by the utility.



DANGER: RISK OF BURNING

12 Troubleshooting

12.3 Solving problems based on symptoms

12.3.1 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 65) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 66). ■ The water pressure is >1 bar. ■ The expansion vessel is NOT broken. ■ The resistance in the water circuit is NOT too high for the pump (see "15.11 ESP curve" on page 99). <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 "To check the water volume" on page 24).

12.3.2 Symptom: The compressor does NOT start (space heating or domestic water heating)

Possible causes	Corrective action
The unit must start up out of its operation range (the water temperature is too low)	<p>If the water temperature is too low, the unit uses the backup heater to reach the minimum water temperature first (15°C). Check and make sure that:</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>

Possible causes	Corrective action
The preferential kWh rate power supply settings and electrical connections do NOT match	For setting the preferential kWh rate power supply, see To connect to a preferential kWh rate power supply. This should match with the connections as explained in "6.4.1 About preparing electrical wiring" on page 25 and "7.6.4 To connect the main power supply" on page 36.
The preferential kWh rate signal was sent by the electricity company	Wait for the power to return (2 hours max.).

12.3.3 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see "9.3.1 To perform a manual air purge" on page 65) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 66).
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 To set the pre-pressure of the expansion vessel).

12.3.4 Symptom: The pressure relief valve opens

Possible causes	Corrective action
The expansion vessel is broken	Replace the expansion vessel.
The water volume in the installation is too high	Make sure that the water volume in the installation is below the maximum allowed value (see "6.3.3 To check the water volume" on page 23 and To set the pre-pressure of the expansion vessel).
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>

12.3.5 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.

12.3.6 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 "15.3 Components" on page 74 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]
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]

12.3.7 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.

12.3.8 Symptom: Decoration panels are pushed away due to a swollen tank

Possible causes	Corrective action
Failing or blocked pressure relief valve.	Contact your local dealer.

12.4 Solving problems based on error codes

When a problem happens, an error code appears on the user interface. It is important to understand the problem and to take countermeasure before resetting the error code. This should be done by a licensed installer or by your local dealer.

This chapter gives you an overview of all error codes and the content of the error code as it appears on the user interface.

For a more detailed troubleshooting guideline for each error, please see the service manual.

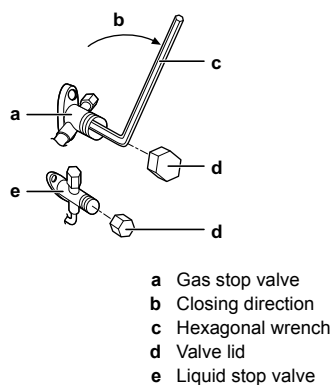
12.4.1 Error codes: Overview

Error codes of the 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.
7H	02	Water circuit pressure is too high.
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.

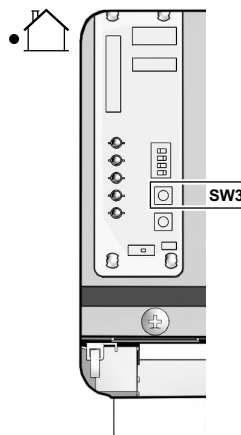
13 Disposal

Error code	Detailed error code	Description
AC	00	Booster heater overheated. Please contact your dealer.
EC	00	Abnormal increase tank temperature.
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.
7H	03	Water circuit pressure is too high.
A1	00	EEPROM reading error.
AH	00	Tank disinfection function not completed correctly.
89	03	Heat exchanger frozen.



13.2 To start and stop forced cooling

- 1 Press the forced cooling operation switch SW3 to begin forced cooling.
- 2 Press the forced cooling operation switch SW3 to stop forced cooling.



NOTICE
Take care that while running forced cooling operation, the water temperature remains higher than 5°C (see temperature read out of the indoor unit). You can achieve this, for example, by activating all fans of the fan coil units.

13 Disposal

13.1 To pump down

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

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



NOTICE

During pump down operation, stop the compressor before removing the refrigerant piping. If the compressor is still running and the stop valve is open during pump down, air will be sucked into the system. Compressor breakage and other injury will be the result due to abnormal pressure in the refrigerant cycle.

Pump down operation will extract all refrigerant from the system into the outdoor unit.

- 1 Remove the valve lid from liquid stop valve and gas stop valve.
- 2 Carry out the forced cooling operation.
- 3 After 5 to 10 minutes (after only 1 or 2 minutes in case of very low ambient temperatures ($<-10^{\circ}\text{C}$)), close the liquid stop valve with a hexagonal wrench.
- 4 Check with the manifold if the vacuum is reached.
- 5 After 2-3 minutes, close the gas stop valve and stop forced cooling operation.

14 Glossary

Dealer:

Sales distributor for the product.

Authorized installer:

Technical skilled person who is qualified to install the product.

User:

Person who is owner of the product and/or operates the product.

Applicable legislation:

All international, European, national and local directives, laws, regulations and/or codes that are relevant and applicable for a certain product or domain.

Service company:

Qualified company which can perform or coordinate the required service to the product.

Installation manual:

Instruction manual specified for a certain product or application, explaining how to install, configure and maintain it.

Operation manual:

Instruction manual specified for a certain product or application, explaining how to operate it.

Accessories:

Labels, manuals, information sheets and equipment that are delivered with the product and that need to be installed according to the instructions in the accompanying documentation.

Optional equipment:

Equipment made or approved by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

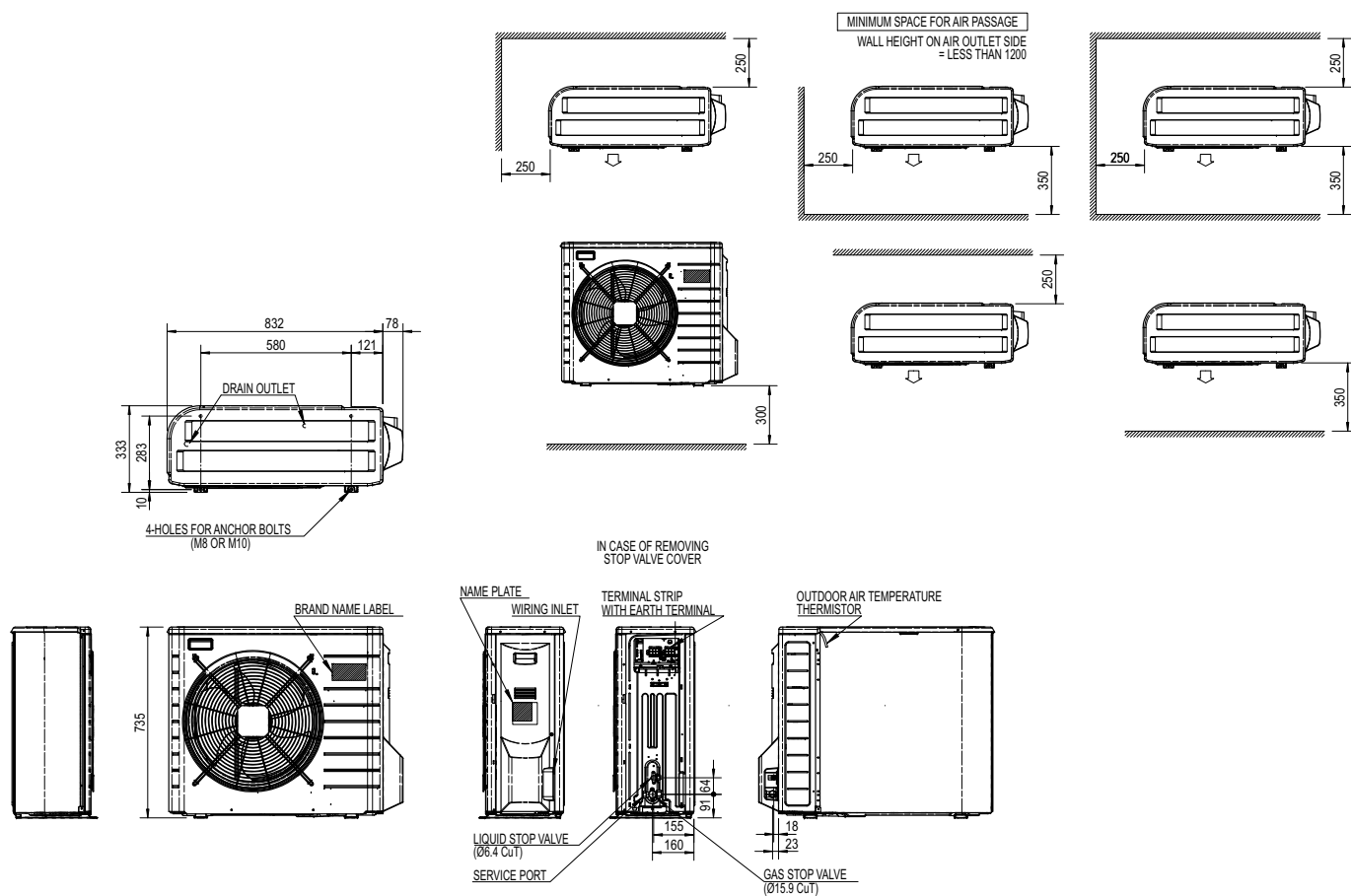
Field supply:

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

15 Technical data

15.1 Dimensions and service space

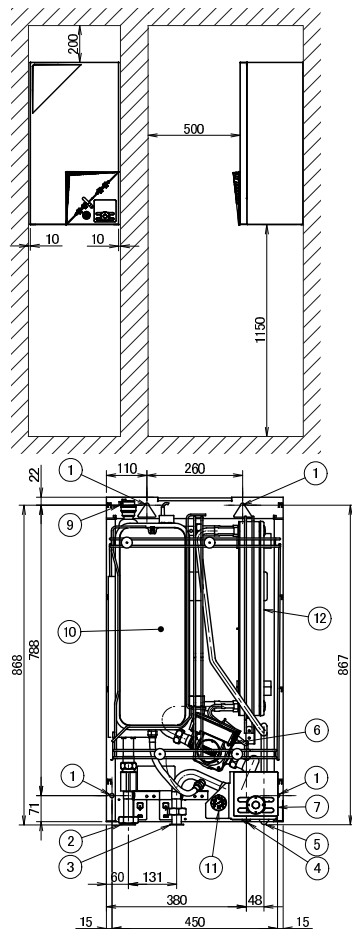
15.1.1 Dimensions and service space: Outdoor unit



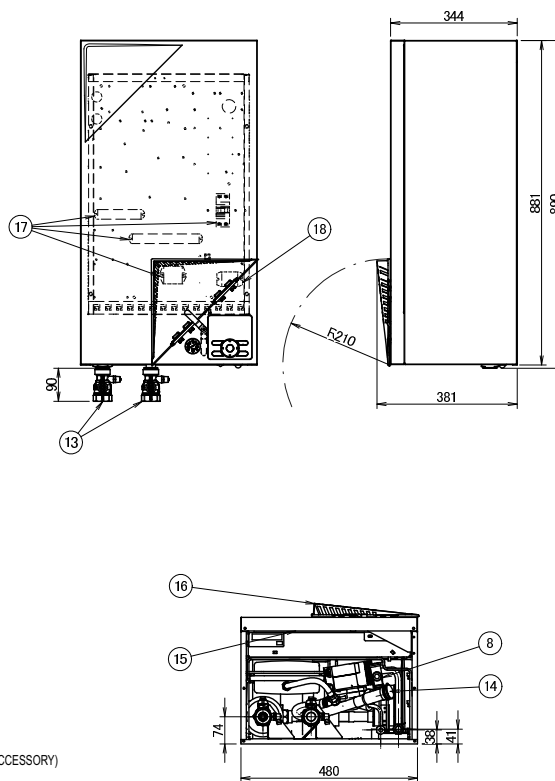
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15.1.2 Dimensions and service space: Indoor unit

REQUIRED SPACE FOR SERVICE AND VENTILATION



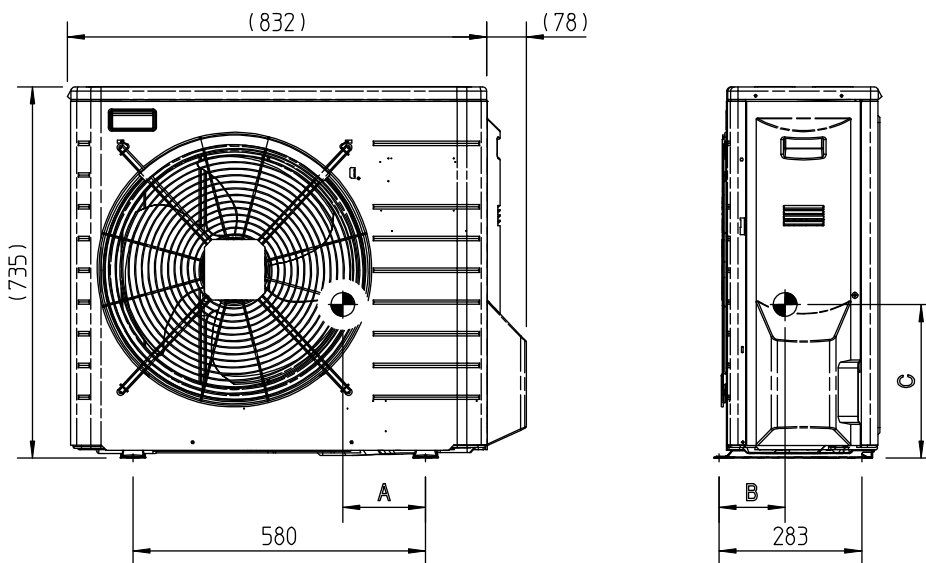
- ① HOLES (Ø12) FOR FIXATION TO THE WALL
- ② WATER OUT CONNECTION (1-1/4" F BSP)
- ③ WATER IN CONNECTION (1-1/4" F BSP)
- ④ REFRIGERANT LIQUID CONNECTION Ø6.35 (FLARE)
- ⑤ REFRIGERANT SUCTION CONNECTION Ø15.9 (FLARE)
- ⑥ PUMP
- ⑦ USER INTERFACE
- ⑧ SAFETY VALVE (PRESSURE)
- ⑨ AIR PURGE
- ⑩ EXPANSION VESSEL
- ⑪ PRESSURE GAUGE
- ⑫ HEAT EXCHANGER (REFRIGERANT/WATER)
- ⑬ SHUT OFF VALVE WITH DRAIN/FILL VALVE (1-1/4" F BSP) (INCLUDED ACCESSORY)
- ⑭ WATER FILTER
- ⑮ POWER SUPPLY/COMMUNICATION WIRE ENTRANCE
- ⑯ SERVICE DOOR
- ⑰ SWITCHBOX TERMINALS
- ⑱ SWITCHBOX TERMINALS FOR DOMESTIC HOT WATER TANK (OPTION)



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15.2 Center of gravity

15.2.1 Center of gravity: Outdoor unit

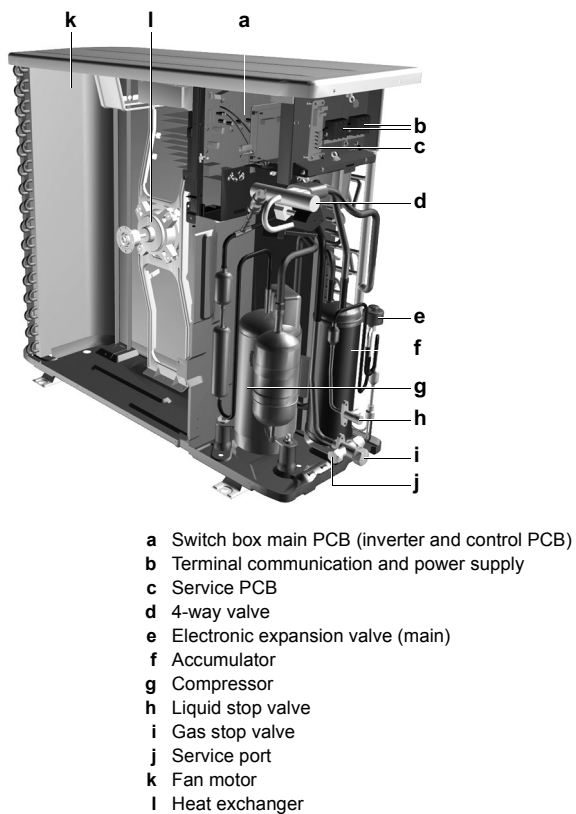


UNIT	A	B	C
ERLQ*004	169	130	306
ERLQ*006/8	164	131	306

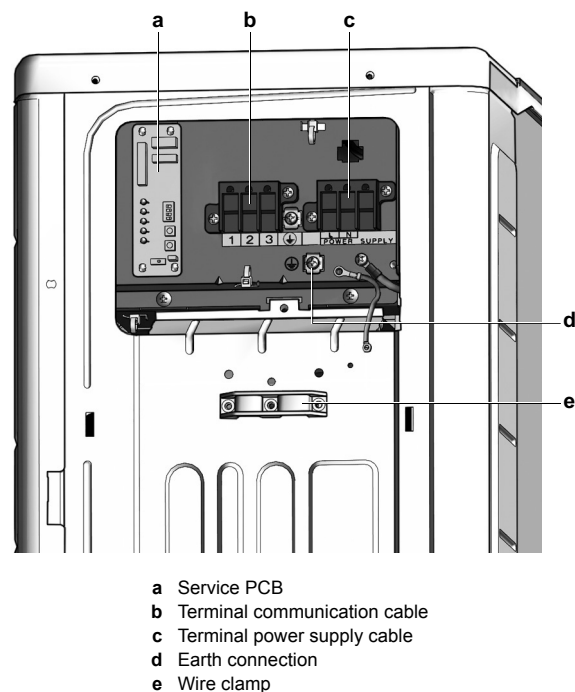
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15.3 Components

15.3.1 Components: Outdoor unit

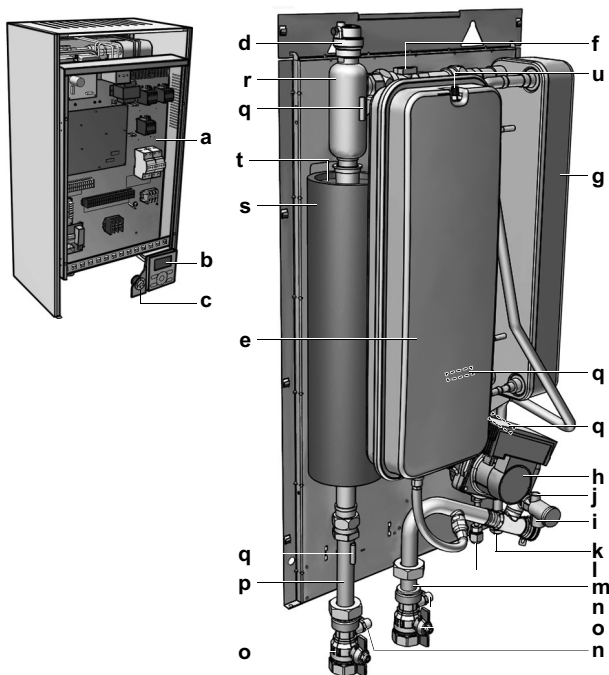


15.3.2 Components: Switch box (outdoor unit)



15 Technical data

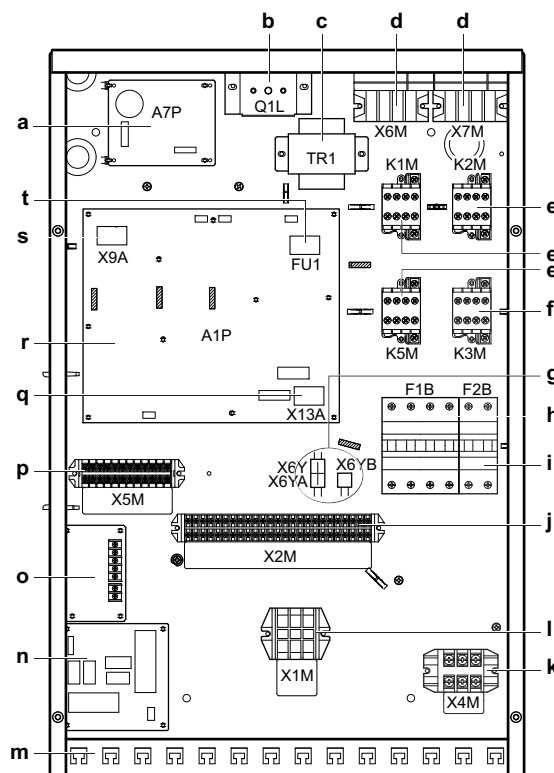
15.3.3 Components: Indoor unit



- a** Switch box
Contains the main electronic and electrical parts of the indoor unit.
- b** User interface (accessory)
- c** Manometer
Allows readout of the water pressure in the water circuit.
- d** Air purge valve
Remaining air in the water circuit will be automatically removed via the air purge valve.
- e** Expansion vessel (10 l)
- f** Flow sensor
Gives feedback to the interface about the actual flow. Based on this information (and other), the interface adjusts the pump speed.
- g** Heat exchanger
- h** Water pump
Circulates the water in the water circuit.
- i** Water filter
Removes dirt from the water to prevent damage to the pump or blockage of the heat exchanger.
- j** Pressure relief valve
Prevents excessive water pressure in the water circuit by opening at 3 bar.
- k** Refrigerant gas connection R410A
- l** Refrigerant liquid connection R410A
- m** Water inlet connection
- n** Drain and fill valves
- o** Shut-off valves (accessory)
Allows isolation of the indoor unit water circuit side from the residential water circuit side.

- p** Water outlet connection
- q** Thermistors
Determines the water and refrigerant temperature at various points in the circuit.
- r** Backup heater thermal fuse
The fuse is blown when the temperature becomes higher than the backup heater thermal protector temperature.
- s** Backup heater thermal protector
The protector activates when the temperature of the backup heater becomes too high.
- t** Backup heater
Provides additional heating in case of cold outdoor temperatures. Also serves as backup in case of malfunctioning of the outdoor unit.
- u** Air valve

15.3.4 Components: Switch box (indoor unit)

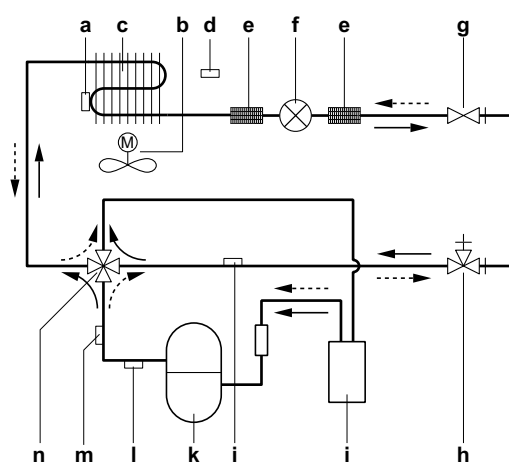


- a** Pump PCB A7P (Inverter PCB)
- b** Backup heater thermal protector Q1L
- c** Transformer TR1
- d** Terminals for backup heater X6M/X7M (*9W models only)
- e** Backup heater contactors K1M, K2M and K5M
- f** Booster heater contactor K4M
- g** Connectors X6YA/X6YB/X6Y
- h** Backup heater circuit breaker F1B
- i** Booster heater circuit breaker F2B. (Only for installations with domestic hot water tank)
- j** Terminal block X2M (high voltage)
- k** Terminal block X3M. (Only for installations with domestic hot water tank)

- l** Terminal block X1M (to outdoor unit)
- m** Cable tie mountings
- n** Digital I/O PCB A4P (only for installations with solar kit or digital I/O PCB kit)
- o** Demand PCB for power limitation
- p** Terminal block X5M (low voltage)
- q** Socket X13A, receives the K3M connector. (Only for installations with domestic hot water tank)
- r** Main PCB A1P
- s** Socket X9A, receives the thermistor connector. (Only for installations with domestic hot water tank)
- t** PCB fuse FU1

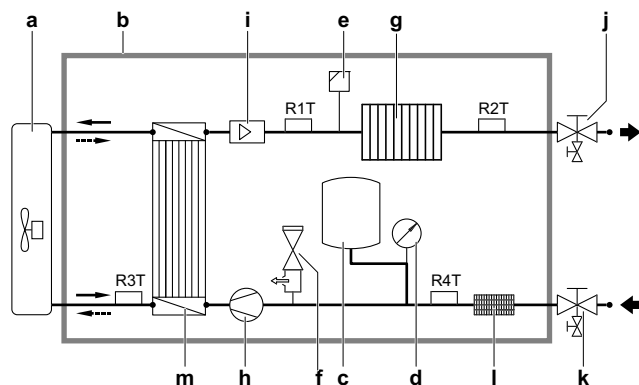
15.4 Functional diagrams

15.4.1 Functional diagram: Outdoor unit



- a** Heat exchanger thermistor
- b** Fan motor
- c** Heat exchanger
- d** Air thermistor
- e** Filter
- f** Electronic expansion valve
- g** Liquid stop valve
- h** Gas stop valve with service port
- i** Accumulator
- j** High pressure switch
- k** Compressor
- l** Discharge thermistor
- m** Pressure sensor
- n** 4-way valve (ON=heating)
- Heating
- > Cooling

15.4.2 Functional diagram: Indoor unit



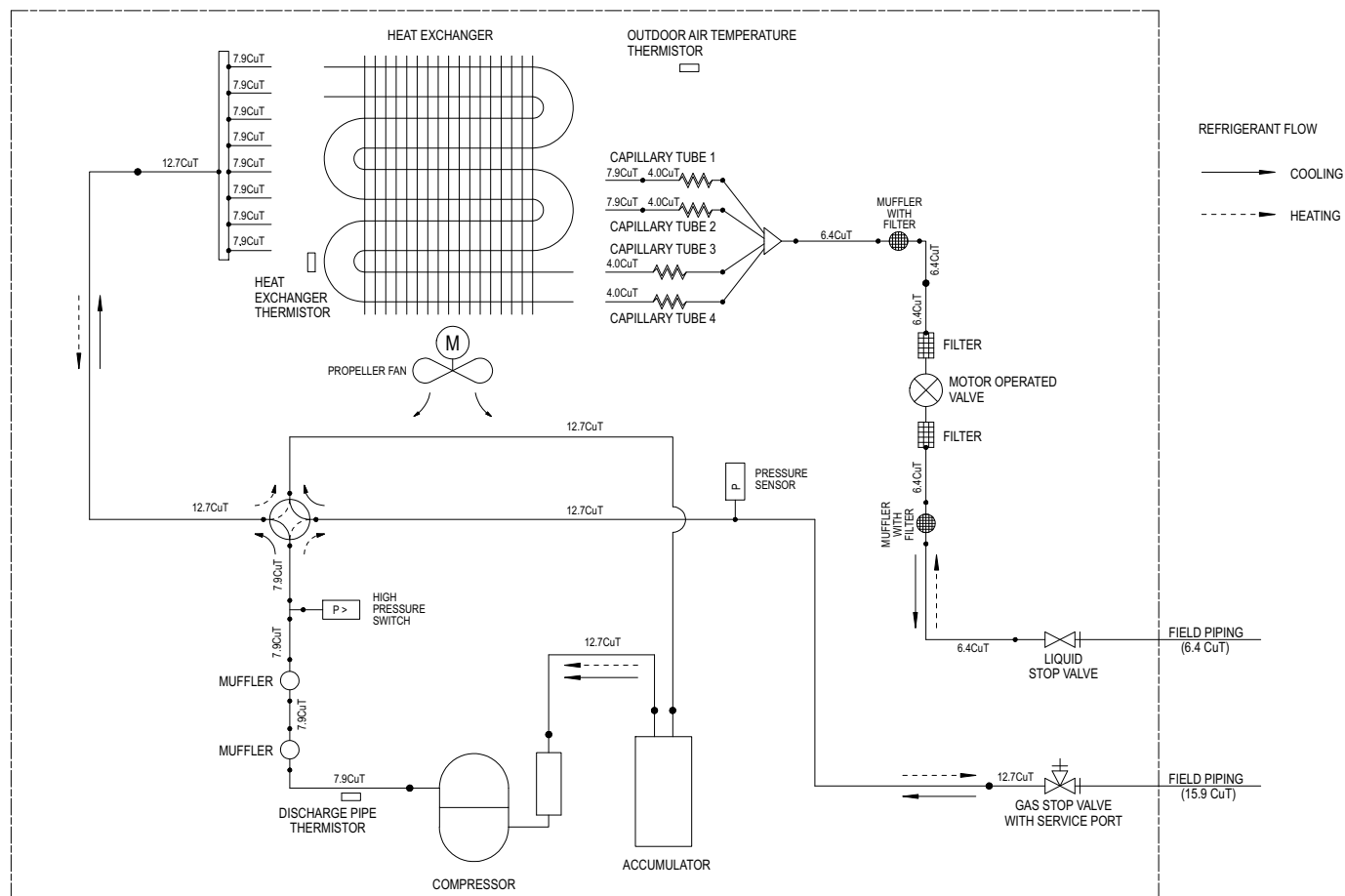
- a** Outdoor unit
- b** Indoor unit
- c** Expansion vessel
- d** Manometer
- e** Air purge valve
- f** Pressure relief valve
- g** Backup heater
- h** Pump
- i** Flow sensor
- j** Shut-off valve water outlet with drain and fill valve (field installation)
- k** Shut-off valve water inlet with drain valve (field installation)
- l** Filter
- m** Heat exchanger
- R1T** Outlet water heat exchanger thermistor
- R2T** Outlet water backup heater thermistor
- R3T** Refrigerant liquid side thermistor
- R4T** Inlet water thermistor
- Heating
- > Cooling

15 Technical data

15.5 Piping diagram

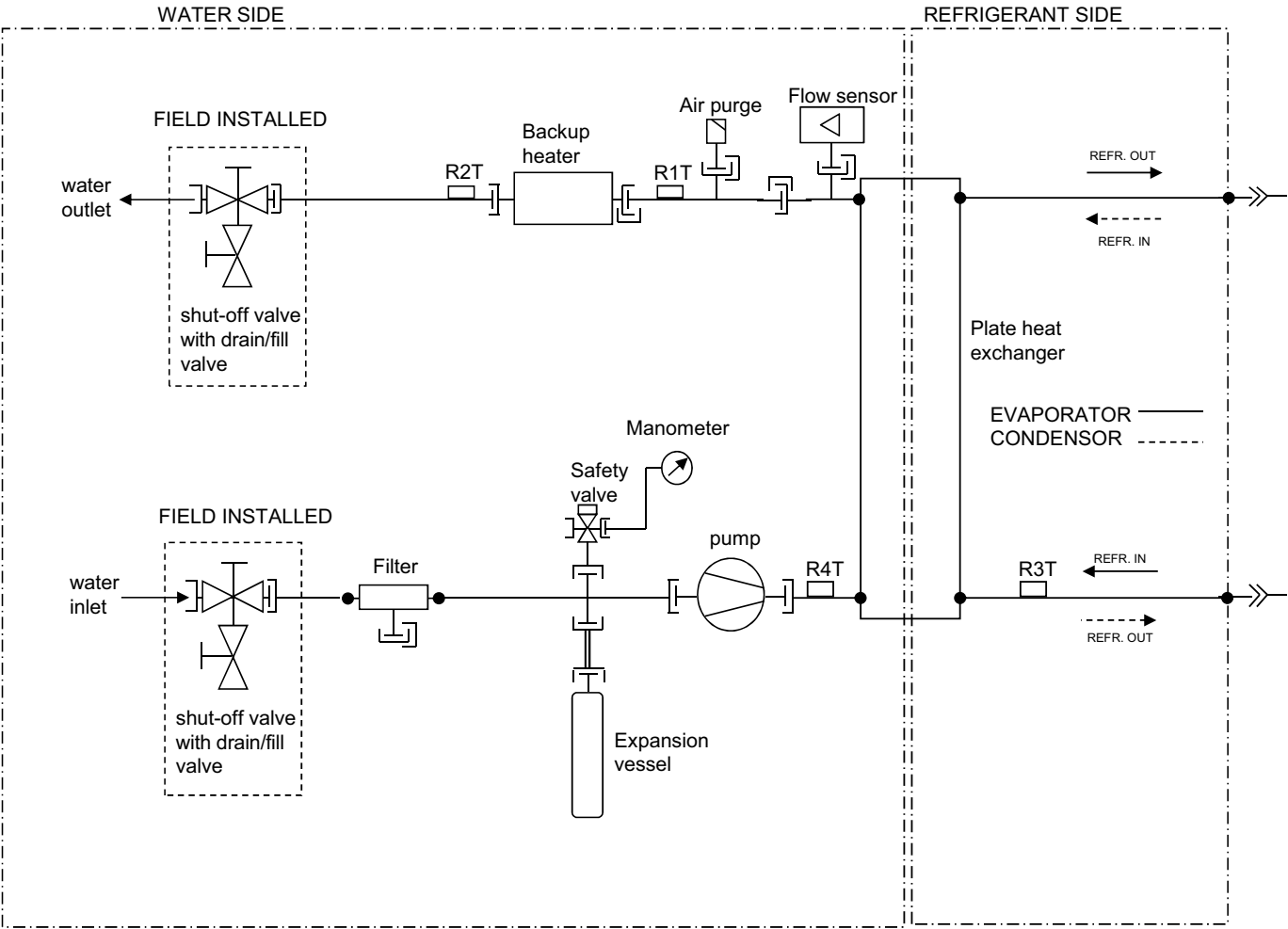
15.5.1 Piping diagram: Outdoor unit

OUTDOOR UNIT











3TW60815-1

15.5.2 Piping diagram: Indoor unit



LEGEND:

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

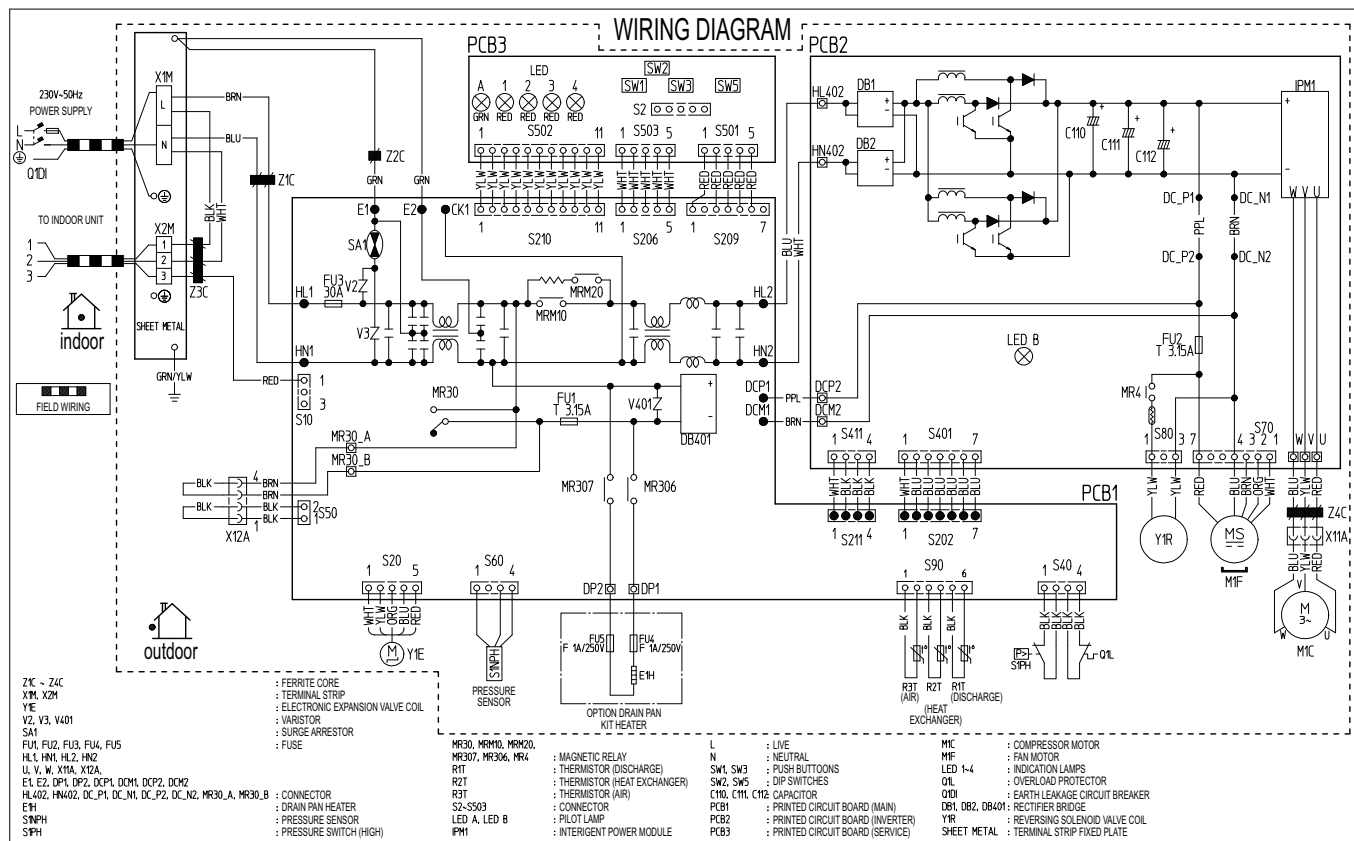
R4T	Inlet water thermistor
R3T	Refrigerant liquid side thermistor
R2T	Outlet water backup heater thermistor
R1T	Outlet water heat exchanger thermisto
THERMISTOR	DESCRIPTION

3D078212

15.6 Wiring diagram

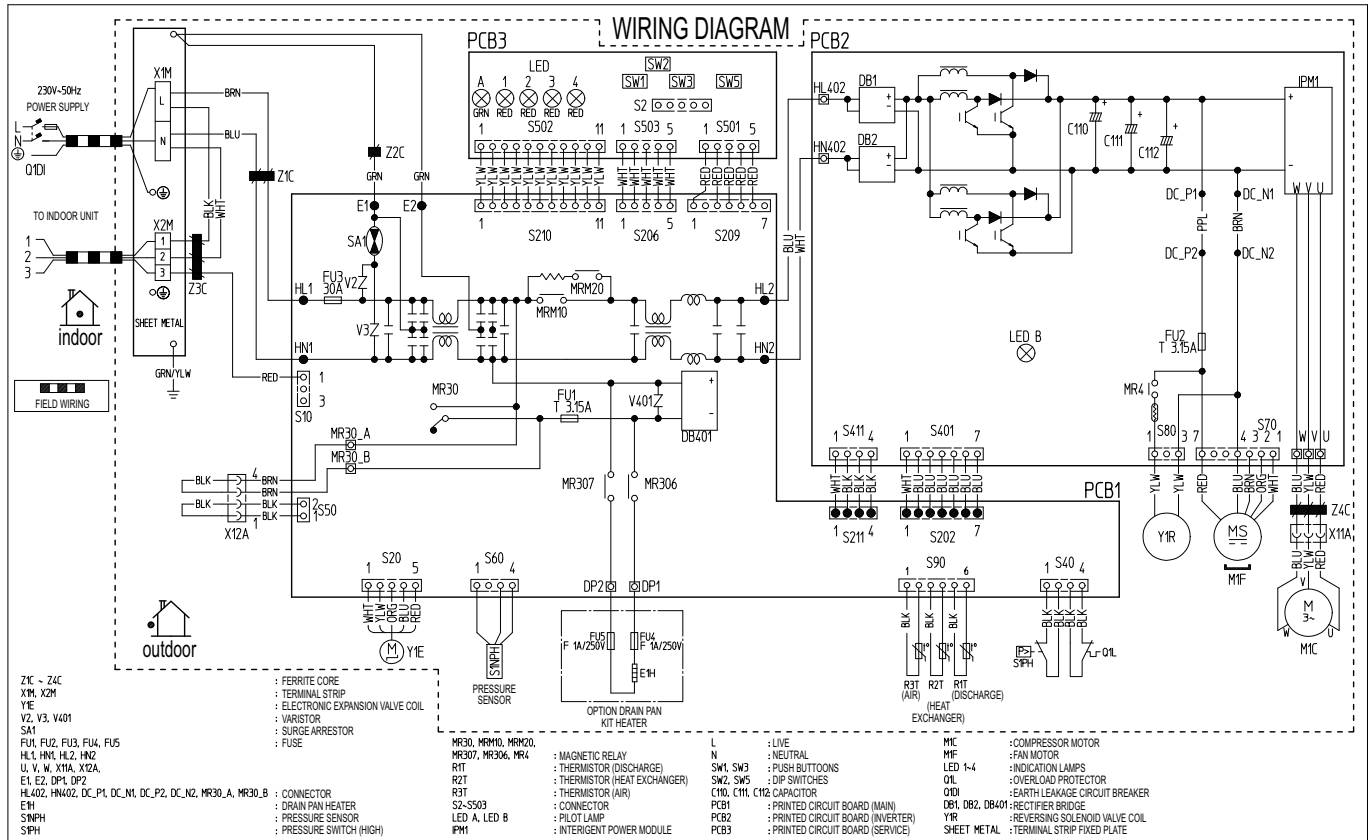
15.6.1 Wiring diagram – components: Outdoor unit

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



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

3TW60816-1A








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

3TW60816-2

C110~C112	Capacitor
DB1, DB2, DB401	Rectifier bridge
DC_N1, DC_N2	Connector
DC_P1, DC_P2	Connector
DC_P1, DC_P2	Connector
DP1, DP2	Connector
E1, E2	Connector
E1H	Drain pan heater
FU1~FU5	Fuse
HL1, HL2, HL402	Connector
HN1, HN2, HN402	Connector
IPM1	Interigent power module
L	Live
LED 1~LED 4	Indication lamps
LED A, LED B	Pilot lamp
M1C	Compressor motor
M1F	Compressor fan
MR30, MRM306, MRM307, MR4	Magnetic relay
MRM10, MRM20	Magnetic relay
MR30_A~MR30_B	Connector
N	Neutral
PCB1	Printed circuit board (main)
PCB2	Printed circuit board (inverter)
PCB3	Printed circuit board (service)

15 Technical data

Q1DI	Earth leakage circuit breaker
Q1L	Overload protector
R1T	Thermistor (discharge)
R2T	Thermistor (heat exchanger)
R3T	Thermistor (air)
S1NPH	Pressure sensor
S1PH	Pressure switch (high)
S2~S503	Connector
SA1	Surge arrester
SHEET METAL	Sheet metal
SW1, SW3	Push buttons
SW2, SW5	DIP switch
U	Connector
V	Connector
V2, V3, V401	Varistor
W	Connector
X11A, X12A	Connector
X1M, X2M	Terminal strip
Y1E	Electronic expansion valve
Y1R	Reversing solenoid valve coil
Z1C~Z4C	Ferrite core
	Field wiring
	Terminal strip
	Connector
	Terminal
	Protective earth
BLK	Black
BLU	Blue
BRN	Brown
GRN	Green
ORG	Orange
PPL	Purple
RED	Red
WHT	White
YLW	Yellow

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

— : Earth wiring
 15 : Wire number 15
 — : Field supply

→ **/12.2 : Connection ** continues on page 12 column 2

① : Several wiring possibilities
 : Option

Wiring depending on model

: Not mounted in switch box

: PCB

Backup heater configuration (only for *9W)

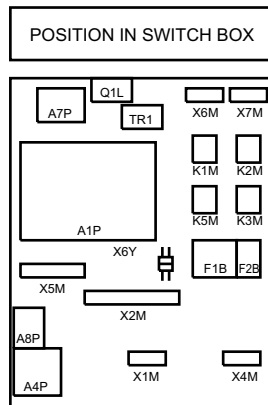
- ☐ 3V3 (1N~, 230 V, 3 kW)
☐ 6V3 (1N~, 230 V, 6 kW)
☐ 6WN (3N~, 400 V, 6 kW)
☐ 9WN (3N~, 400 V, 9 kW)
☐ 6T1 (3~, 230 V, 6 kW)

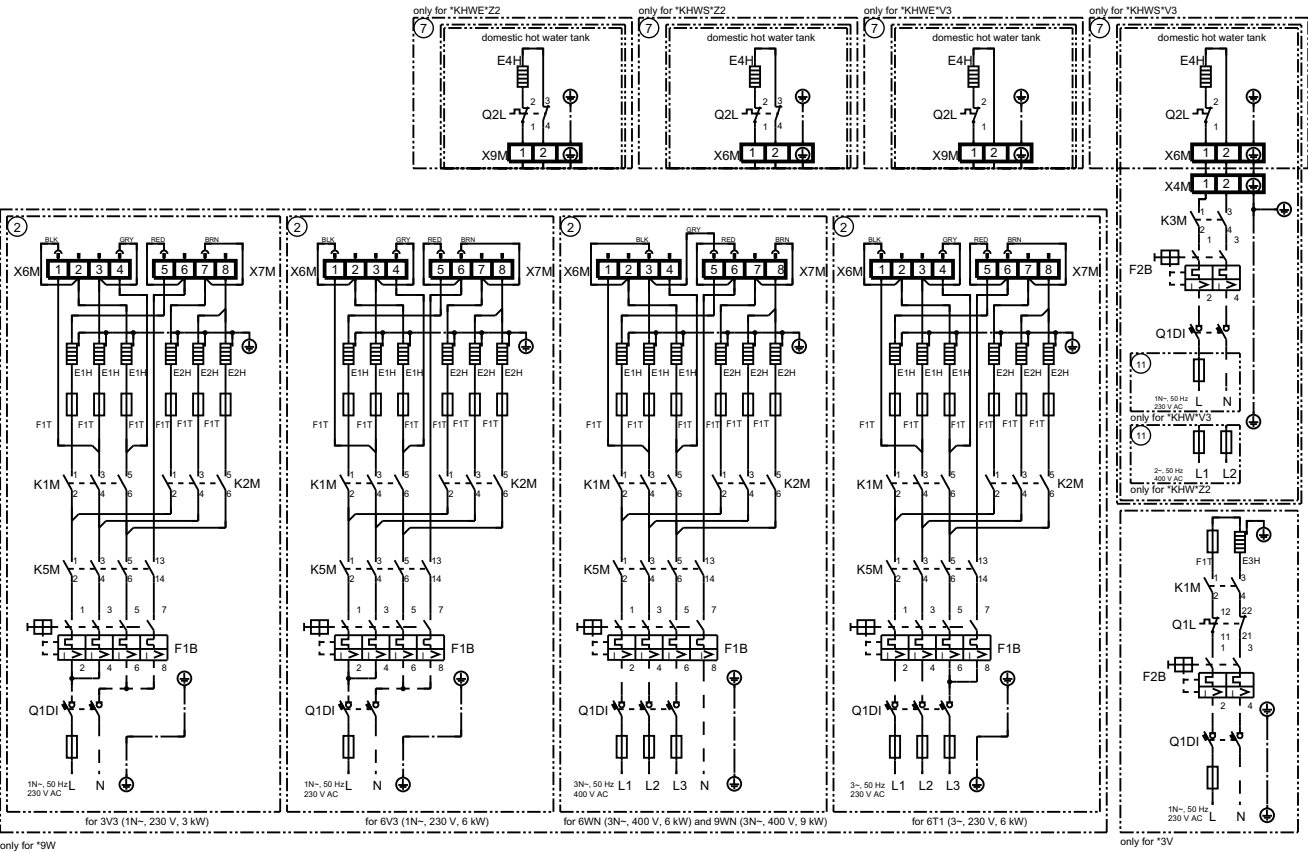
User installed options:

- ☐ 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

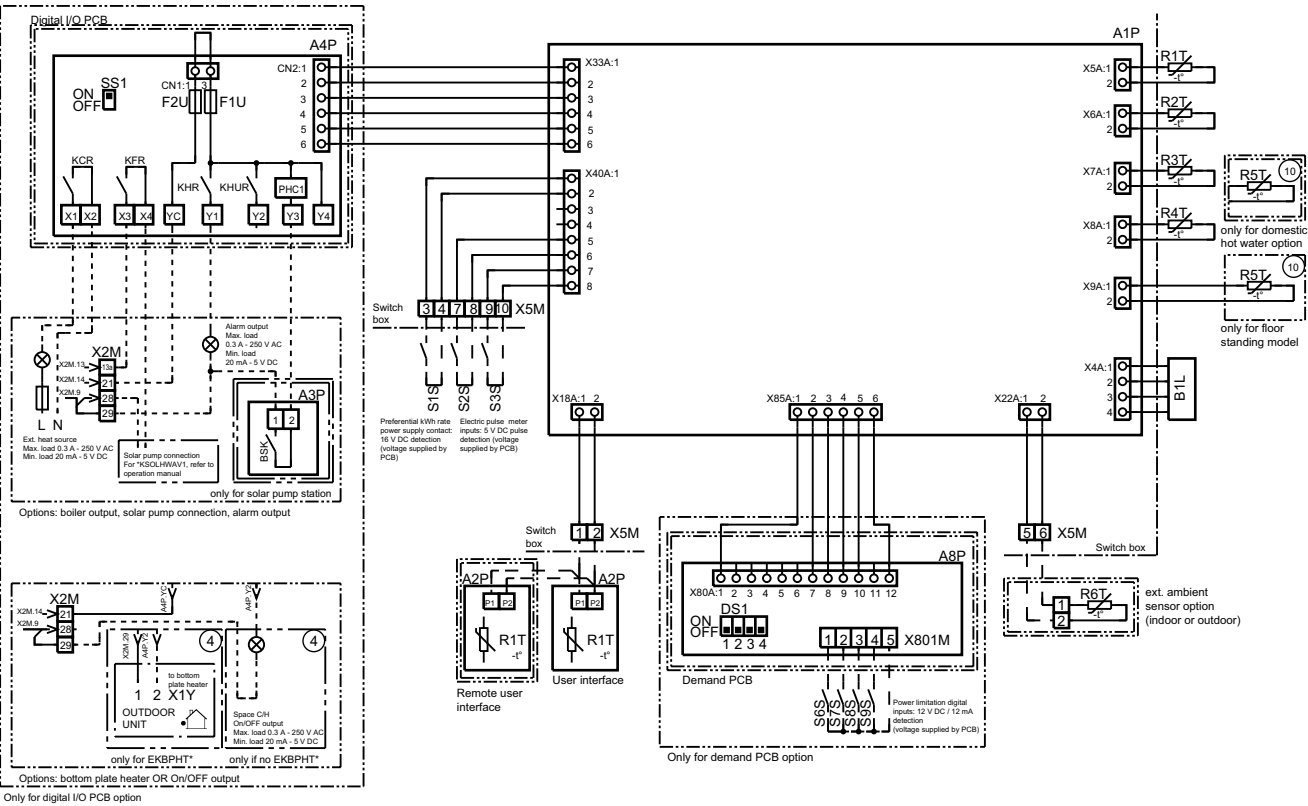
- Main LWT:
☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)
☐ Ext. thermistor
☐ Heat pump convactor

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

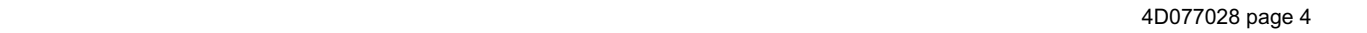




4D077028 page 2



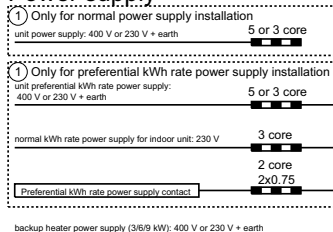
4D077028 page 3



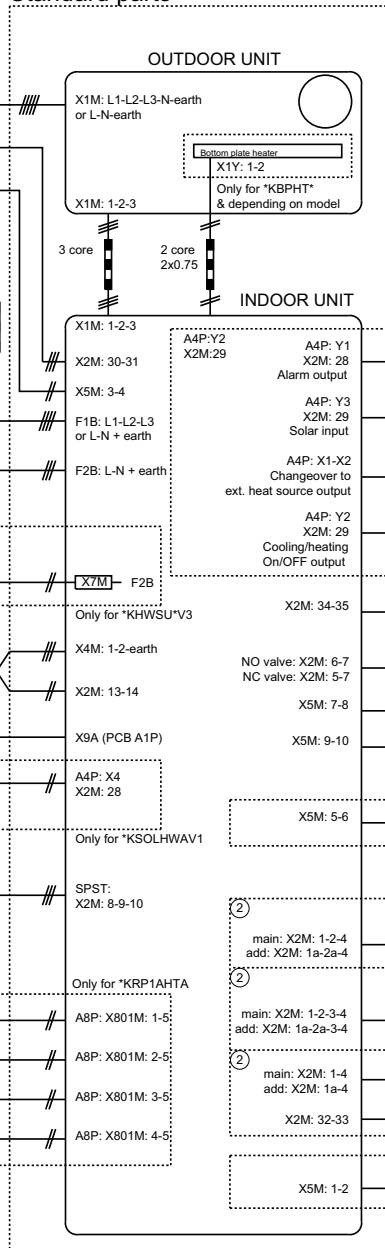
Electrical connection diagram Daikin Altherma

For more details please check unit wiring

Power supply

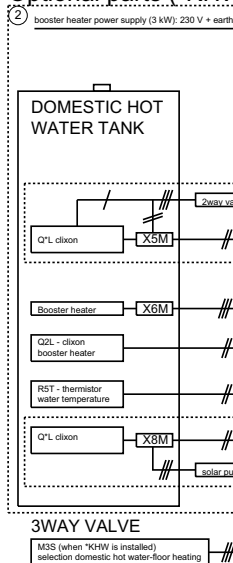


Standard parts

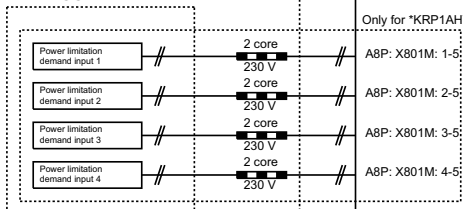


Notes:
- In case of signal cable: keep minimum distance to power cables > 5 cm
- Available heaters depending on model: see combination table

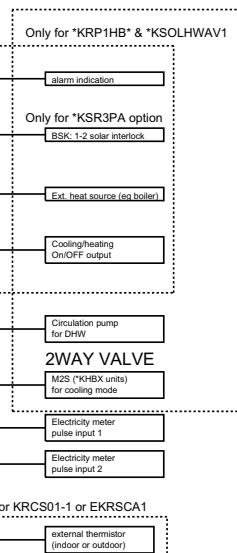
Optional parts (*KHW*)



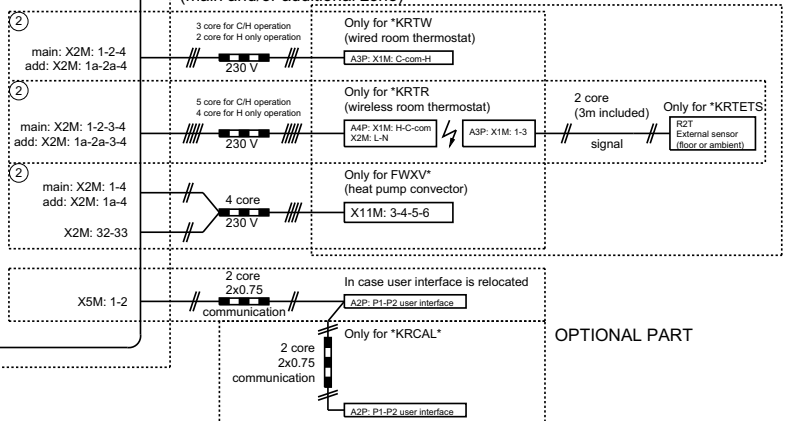
FIELD SUPPLY



FIELD SUPPLY



EXTERNAL ROOM THERMOSTAT / HEAT PUMP CONVECTOR (main and/or additional zone)



OPTIONAL PART

4D078494

* electrical meter specification

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

* electrical meter installation guideline

- General: it is the 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	-	-				
	3~ balanced	-	-	-	-	-	-	1	1	1				
	3~ unbalanced	-	1	1	-	1	1	-	1	1				

4D078288

A1P		Main PCB
A2P		User interface PCB
A3P	*	Solar pump station PCB
A3P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A4P	*	Receiver PCB (Wireless On/OFF thermostat)
A7P		Pump driver PCB (only for EHBH/X04+08 and EHVH/X04+08)
A8P	*	Demand PCB
B1L		Flow sensor
BSK	*	Solar pump station relay
DS1(A8P)	*	DIP switch
E1H		Backup heater element (1 kW)
E2H		Backup heater element (2 kW)
E3H		Backup heater element (3 kW)
E4H	*	Booster heater (3 kW)
F1B		Overcurrent fuse backup heater

F2B	*	Overcurrent fuse booster heater
F1T		Thermal fuse backup heater
F1U, F2U	*	Fuse 5 A 250 V for digital I/O PCB
FU1		Fuse T 6.3 A 250 V for PCB
PHC1	*	Optocoupler input circuit
K1M, K2M		Contacteur backup heater
K3M	*	Contacteur booster heater
K5M		Safety contacteur backup heater (only for *9W)
K*R		Relay on PCB
M1P		Main supply pump
M2P	#	Domestic hot water pump
M2S	#	2-way valve for cooling mode
M3S	(*)	3-way valve for floor heating/domestic hot water
Q1DI, Q2DI	#	Earth leakage circuit breaker
Q1L		Thermal protector backup heater
Q2L	*	Thermal protector booster heater
R1T		Outlet water heat exchanger thermistor

15 Technical data

R1T (A2P)		Ambient sensor user interface
R1T (A3P)	*	Ambient sensor On/OFF thermostat
R2T		Outlet backup heater thermistor
R2T	*	External sensor (floor or ambient)
R3T		Refrigerant liquid side thermistor
R4T		Inlet water thermistor
R5T	(*)	Domestic hot water thermistor
R6T	*	External indoor or outdoor ambient thermistor
R1H (A3P)	*	Humidity sensor
S1S	#	Preferential kWh rate power supply contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S6S~S9S	#	Digital power limitation inputs
SS1 (A4P)	*	Selector switch
T1R (A7P)		Rectifier bridge (only for EHBH/X04+08 and EHVH/X04+08)
TR1		Power supply transformer
X*M		Terminal strip
X*Y		Connector
	*	= Optional
	(*)	= Standard for EHVH/X, optional for EHBH/X
	#	= Field supply
BLK		Black
BRN		Brown
GRY		Grey
RED		Red

English	Translation
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

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

15.7 Technical specifications

15.7.1 Technical specifications: Outdoor unit

NOMINAL CAPACITY AND NOMINAL INPUT

For combination indoor units + outdoor units

			HEATING ONLY TYPE			REVERSIBLE TYPE				
Outdoor units			ERLQ004*	ERLQ006*	ERLQ008*	ERLQ004*	ERLQ006*	ERLQ008*		
Indoor units			EKHBH008*	EKHBH008*	EKHBH008*	EKHBH008*	EKHBH008*	EKHBH008*		
			Floor standing type							
Condition 1	Heating capacity	Minimum	kW	1.80	1.80	1.80	1.80	1.80	1.80	
		Nominal	kW	4.40	6.00	7.40	4.40	6.00	7.40	
		Maximum	kW	5.12	8.35	10.02	5.12	8.35	10.02	
	Cooling capacity	Minimum	kW	---	---	---	2.00	2.50	2.50	
		Nominal	kW	---	---	---	5.00	6.76	6.86	
		Maximum	kW	---	---	---	---	---	---	
	Heating PI	Nominal	kW	0.87	1.27	1.66	0.87	1.27	1.66	
		Cooling PI	Nominal	kW	---	---	---	1.48	1.96	2.01
		COP	Nominal	-	5.04	4.74	4.45	5.04	4.74	4.45
	EER	Nominal	-	---	---	---	3.37	3.45	3.42	
Condition 2	Heating capacity	Minimum	kW	1.80	1.80	1.80	1.80	1.80	1.80	
		Nominal	kW	4.03	5.67	6.89	4.03	5.67	6.89	
		Maximum	kW	4.90	7.95	9.53	4.90	7.95	9.53	
	Cooling capacity	Minimum	kW	---	---	---	2.00	2.50	2.50	
		Nominal	kW	---	---	---	4.17	4.84	5.36	
		Maximum	kW	---	---	---	---	---	---	
	Heating PI	Nominal	kW	1.13	1.59	2.01	1.13	1.59	2.01	
		Cooling PI	Nominal	kW	---	---	---	1.80	2.07	2.34
		COP	Nominal	-	3.58	3.56	3.42	3.58	3.56	3.42
	EER	Nominal	-	---	---	---	2.32	2.34	2.29	
Notes			* Condition 1							
			- cooling Ta 35°C - LWE 18°C (DT=5°C)							
			- heating Ta DB/WB 7°C/6°C - LWC 35°C (DT = 5°C)							
			* Condition 2							
			- cooling Ta 35°C - LWE 7°C (DT = 5°C)							
			- heating Ta DB/WB 7°C/6°C - LWC 45°C (DT = 5°C)							

TECHNICAL SPECIFICATIONS

Casing	Colour					Ivory white	
	Material					<Polyester painted galvanised steel>	
Dimensions	Packing	Height		mm		797	
		Width		mm		990	
		Depth		mm		390	
	Unit	Height		mm		735	
		Width		mm		832	
		Depth		mm		307	
Weight	Machine Weight : ERLQ004* / ERLQ006* & ERLQ008*				kg	54 / 56	
	Gross Weight : ERLQ004* / ERLQ006* & ERLQ008*				kg	57 / 59	
Packing	Material					EPS, CARTON	
Heat exchanger	Weight					kg	3
	Specifications	Length		mm		845	
		N° of rows				2	
		Fin pitch		mm		1.8	
		N° of passes				-	
		Face area		m²		-	
		N° of stages				32	
	Tube type					<H-Xa(8)>	
Fin	Type					<WF In>	
	Treatment					<Anti-corrosion treatment (PE)>	
Fan	Type					<Propeller>	
	Quantity					1	
	Air flow rate (nominal at 230V)	Heating	high	m³/min		-	
			low	m³/min		-	
		Cooling	high	m³/min		-	
			low	m³/min		-	
	Discharge direction					<Horizontal>	
	Motor	Quantity					1
	Output					W	53
Compressor	Quantity					1	
	Motor	Model					2YC36BXD#C (ERLQ004*) / 2YC45DXD#C (ERLQ006*+ERLQ008*)
	Type					<Hermetically sealed swing compressor>	
PED	Category of unit most critical part =	Motor output					W
							/
		Ps*V					bar*l
		Ps*DN					bar
		(*) excluded from scope of PED due to article 1, item 3.6 of 97/23/EC					
Operation range (1)	Heating (outdoor unit)*	Min			*CDB	-25	
		Max			*CDB	25	
	Cooling	Min			*CWB	10	
		Max			*CWB	43	
	Domestic Hot Water (outdoor unit)**	Min			*CDB	-25	
		Max			*CDB	35	
Sound level (nominal)	Heating	Sound power (4/6/8)			dBA	61 / 61 / 62	
		Sound pressure (4/6/8) (2)			dBA	48 / 48 / 49	
	Cooling	Sound power			dBA	63 / 63 / 63	
		Sound pressure (4/6/8) (2)			dBA	48 / 49 / 50	
Sound level (night quiet)		Sound pressure			dBA		
Refrigerant	Type					<R-410A>	
	Charge ERLQ004* / ERLQ006* & ERLQ008*					kg	1.45 / 1.60
	Control					<Expansion valve (electronic type)>	
Refrigerant oil	N° of circuits					1	
	Type					<FVC50K>	
	Charged volume					l	0.75
Piping connections	Liquid	Type					<Flare connection>
		Diameter (OD)			mm		<6.35>
	Gas	Type					<Flare connection>
		Diameter (OD)			mm		<15.9>
	Drain	Quantity					2
		Type					hole
	Piping length	Diameter (OD)			mm		1xØ15 + 1xØ20
		Minimum			m		3
		Maximum			m		30
		Equivalent			m		-
Additional refrigerant charge	Chargeless			m		-	
		kg/m				0.02 IF > 10 m	
	Height difference between outdoor unit and indoor unit	Maximum			m	20	
Defrost method						<Reverse cycle>	
Defrost control						<Sensor for outdoor heat exchanger temperature>	
Capacity control method						<Inverter controlled>	
Standard accessories	Item					<Installation manual>	
	Quantity					1	
Notes	(1) See operation range drawing. (*) range increase by support backup heater. (**) range increase by support booster heater or backup heater (2) The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to sound spectrum drawing for more information.						

ELECTRICAL SPECIFICATIONS

3TW60811-1 A page 2

TECHNICAL SPECIFICATIONS

3D078754 B page 1

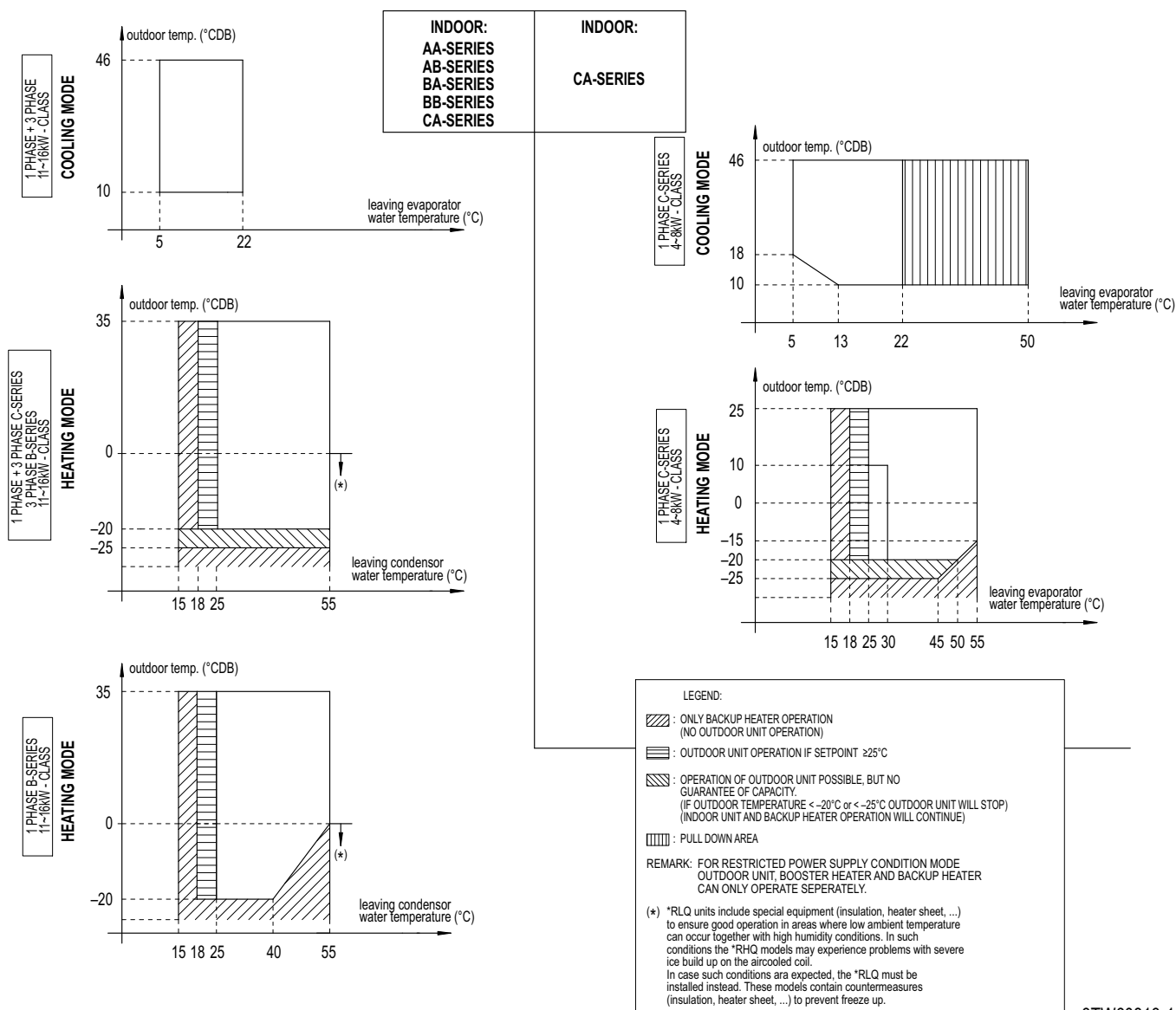
ELECTRICAL SPECIFICATIONS									
Electric heater (optional)	Type		3V		9W				
	Capacity setting	kW	3	6	3	6	6	9	
	Power supply (1)	Phase	1~	3~	1~	1~	3~	3~	
		Frequency	Hz	50		50			
		Voltage	V	230	230	230	230	400	400
	Current	Running Current (back-up heater)	A	13	15,1	13	26	8,7	13
		Zmax (back-up heater)	Ω	-	-	-	0,29	-	-
		Minimum S _c Value (8)	Ω	-	-	-	(9)	-	-
		Zmax (back-up heater + booster heater ("KHW" models))	Ω	0,29	-	-	0,17	-	-
		Running Current (back-up heater + booster heater ("KHW" models))	A	26 (13+13)	28,1 (15,1+13)	26 (13+13)	39 (26+13)	21,7 (8,7+13)	26 (13+13)
		Minimum S _c Value (8)	A	-	-	-	-	16,2 (8,7+7,5)	20,5 (13+7,5)
		+ EK*V3	kVA	(9)	(9)	(9)	(9)	(9)	(9)
		+ EK*Z2	kVA	-	-	-	-	(9)	(9)
Voltage range		Minimum	V	207	207	207	207	380	380
		Maximum	V	253	253	253	253	440	440
Wiring connections	for power supply back up heater	quantity of wires							
		type of wires	Note (3)	Note (3)	Note (3)	Note (3)	Note (3)	Note (3)	
	Communication cable	quantity of wires							
		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 signal : 2
		type of wires							power : 6,3 A note (3) signal : 0,75 mm ² till 1,25 mm ² (max length 50 m)
	Electricity meter	quantity of wires							2
		type of wires							Minimum 0,75 mm ² (5V DC pulse detection)
	domestic hot water pump	quantity of wires							2
		type of wires							Minimum 0,75 mm ² (2A in rush, 1A continuous)
	Power supply for optional "KHW"	quantity of wires							3G
		type of wires							13A, note (3)
	for connection to optional "KHW" model + Q2L	quantity of wires							5G
		type of wires							Note (3) and (4)
	for connection with R5T	quantity of wires							Note (7)
		type of wires							Note (7)
	for connection with R6T	quantity of wires							2
	for connection with A3P	quantity of wires							Minimum 0,75 mm ²
		type of wires							Note (6)
	for connection with M2S	quantity of wires							Note (3) and (5)
		type of wires							2
	for connection with M3S	quantity of wires							Note (3) and (5)
		type of wires							3
	for connection with optional FVXV (demand input and output signal)	quantity of wires							Note (3) and (5)
		type of wires							4
	for connection with bottom plate heater	quantity of wires							100 mA, minimum 0,75 mm ²
		type of wires							2
Notes									Note (3)
<p>(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. The optional domestic warm water tank has a separate power supply.</p> <p>(3) Select diameter and type according to national and local regulations</p> <p>(4) For more details of the voltage range and current refer to installation manual</p> <p>(5) Voltage: 230V / Maximum current: 100mA / Minimum 0,75mm²</p> <p>(6) Depends on thermostat type, refer to installation manual</p> <p>(7) Wire included in option "KHW"</p> <p>(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</p> <p>(9) Equipment complying with EN/IEC 61000-3-12 (**)</p> <p>(*) : 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.</p> <p>(**) : 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.</p> <p>(***) : System impedance</p>									

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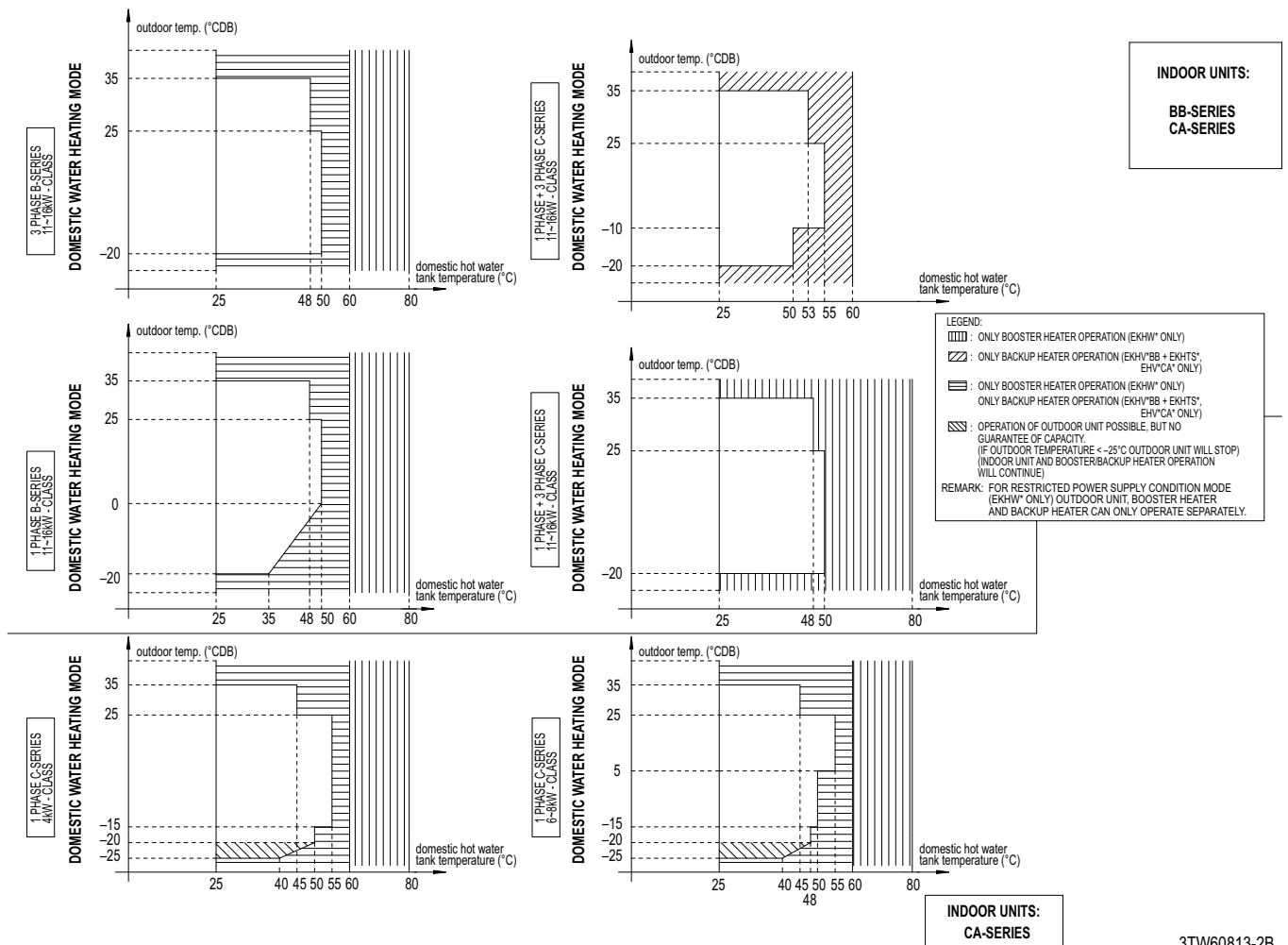
15 Technical data

15.8 Operation range

15.8.1 Operation range: Outdoor unit

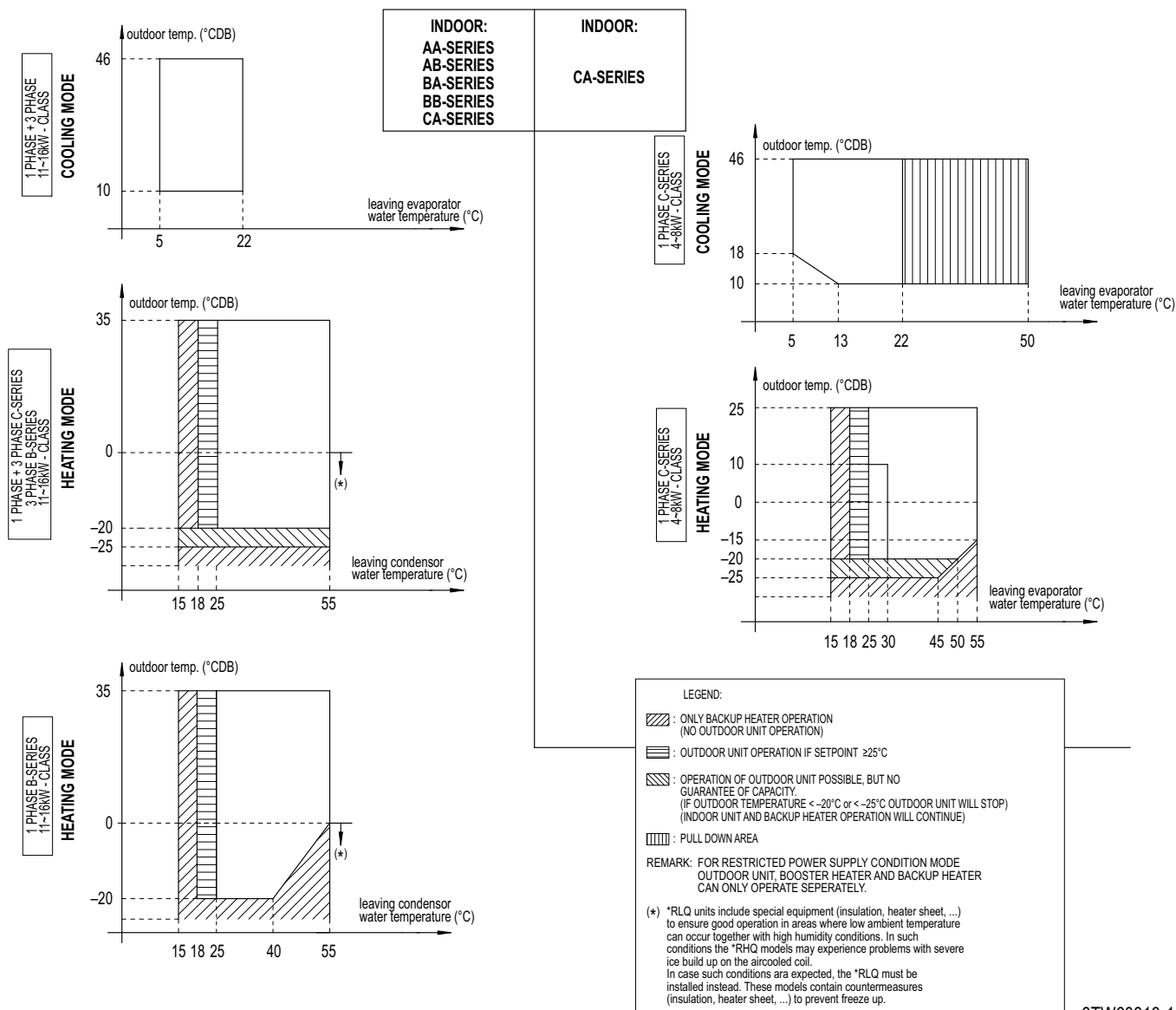


3TW60813-1A

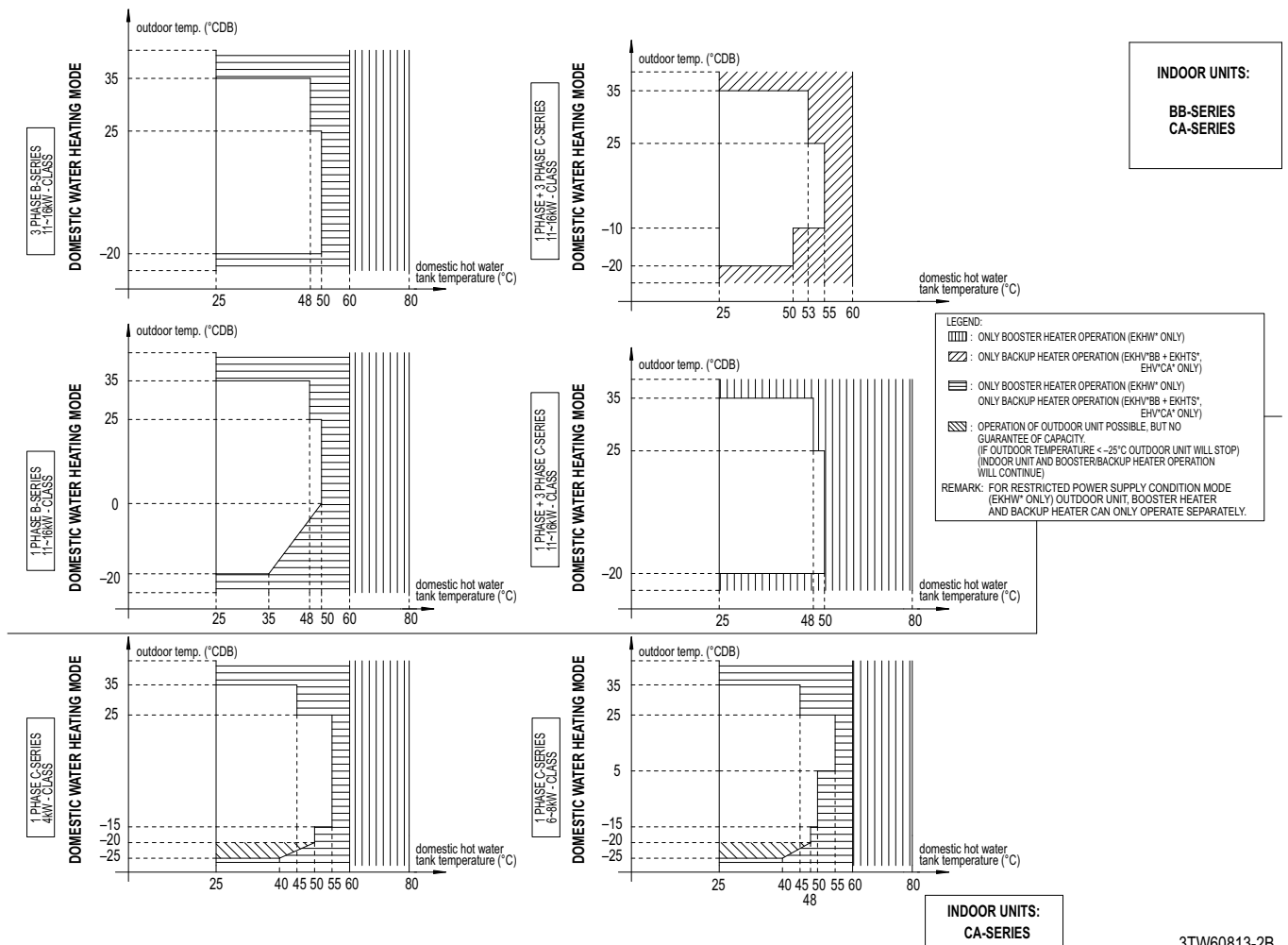


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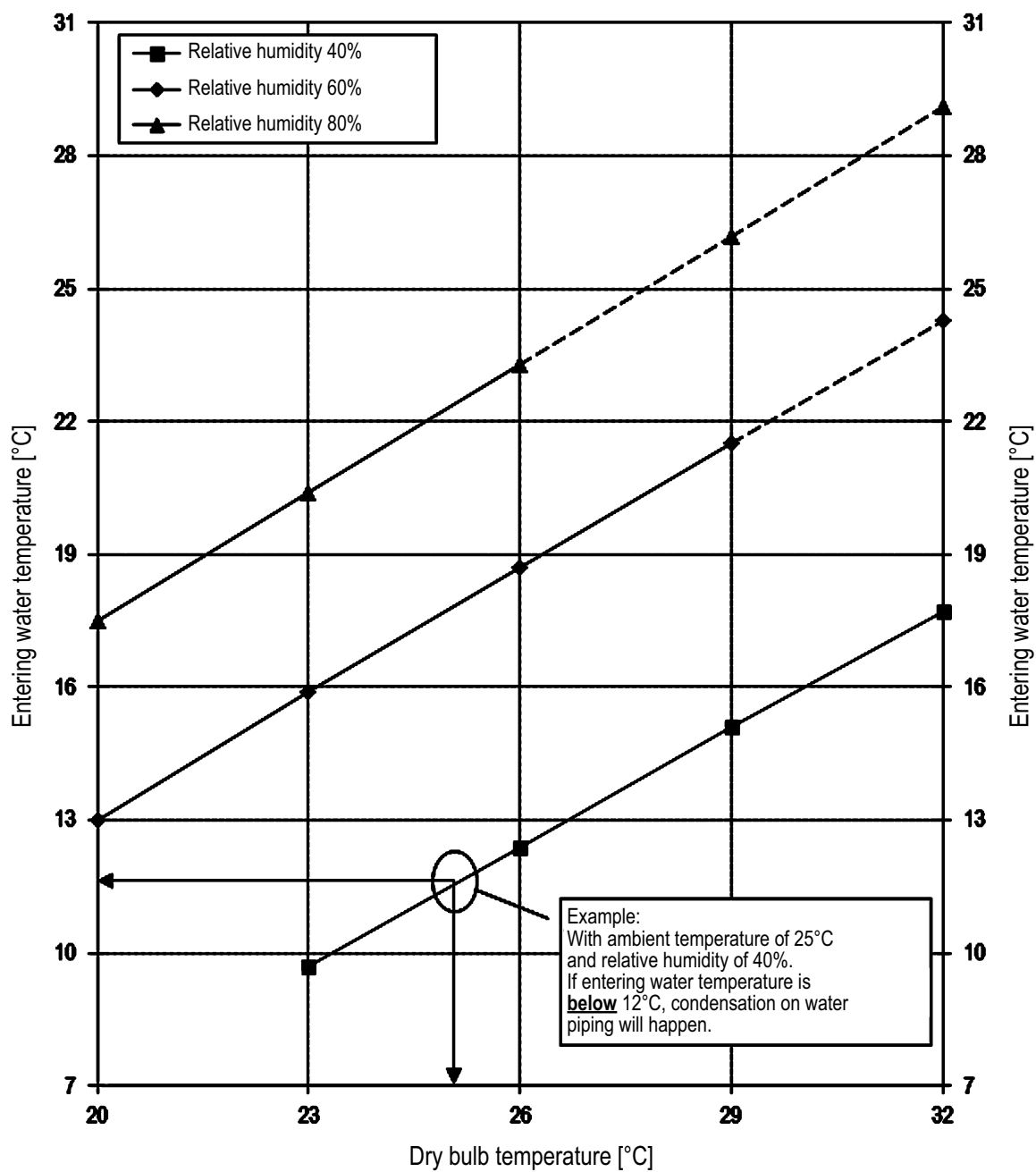
15.8.2 Operation range: Indoor unit



3TW60813-1A



Entering water temperature limit to prevent condensation



1. Refer to psychometric chart for more information.
2. If condensation is expected, installation of EKHBDFCA2 - drainpan kit must be considered.

4D078990

15.9 Capacity table

MAXIMUM COOLING CAPACITY

	T _{amb} [°C]	20		25		30		35		40		43	
	LWE [°C]	CC [kW]	PI [kW]	CC [kW]	PI [kW]	CC [kW]	PI [kW]	CC [kW]	PI [kW]	CC [kW]	PI [kW]	CC [kW]	PI [kW]
"RL0004"	7												
	10												
	13												
	15												
	18												
22													
"RL0006"	7												
	10												
	13												
	15												
	18												
22													
"RL0008"	7												
	10												
	13												
	15												
	18												
22													

MAXIMUM HEATING CAPACITY - PEAK VALUES

		LWC [°C]	30		35		40		45		50		55	
		T _{amb} [°C]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]
RLQ004	-20	2,42	1,58	2,40	1,79	2,35	1,97	2,30	2,19	2,21	2,41			
	-15	3,53	1,57	3,32	1,79	3,38	1,96	3,13	2,21	3,04	2,41	2,80	2,52	
	-7	5,02	1,57	4,91	1,75	4,81	1,93	4,64	2,13	4,34	2,36	4,04	2,49	
	-2	5,16	1,39	5,07	1,56	4,92	1,75	4,82	1,93	4,55	2,17	4,34	2,29	
	2	5,20	1,22	5,10	1,37	4,98	1,58	4,88	1,74	4,69	1,98	4,54	2,08	
	7	5,25	0,99	5,12	1,12	5,00	1,31	4,90	1,44	4,70	1,66	4,54	1,76	
	12	5,29	0,77	5,20	0,86	5,05	1,01	4,91	1,21	4,73	1,47	4,57	1,52	
	15	5,47	0,76	5,29	0,81	5,16	0,98	5,06	1,20	4,76	1,37	4,63	1,48	
	20	6,02	0,74	5,85	0,81	5,73	0,96	5,51	1,13	5,18	1,32	4,89	1,45	
RLQ006	-20	3,26	2,10	3,19	2,27	3,16	2,44	3,02	2,55	2,84	2,63			
	-15	4,21	2,05	4,13	2,22	4,06	2,38	3,93	2,50	3,71	2,57	3,42	2,61	
	-7	6,22	1,99	6,01	2,16	5,80	2,33	5,69	2,44	5,40	2,51	4,97	2,58	
	-2	6,99	1,94	6,81	2,10	6,52	2,26	6,33	2,39	5,99	2,46	5,48	2,54	
	2	7,48	1,90	7,26	2,04	6,96	2,20	6,76	2,33	6,57	2,41	5,96	2,50	
	7	8,48	1,84	8,35	1,99	8,17	2,15	7,95	2,32	7,53	2,40	7,08	2,48	
	12	9,20	1,82	8,97	1,95	8,73	2,11	8,37	2,29	8,01	2,39	7,52	2,47	
	15	10,03	1,79	9,77	1,91	9,46	2,08	9,10	2,26	8,65	2,37	8,14	2,47	
	20	11,51	1,76	11,21	1,87	10,85	2,05	10,44	2,24	9,89	2,36	9,31	2,47	
RLQ008	-20	3,91	2,68	3,83	2,90	3,79	3,11	3,62	3,25	3,40	3,35			
	-15	5,06	2,61	4,95	2,83	4,87	3,04	4,72	3,18	4,45	3,28	4,10	3,33	
	-7	7,47	2,54	7,21	2,76	6,96	2,97	6,82	3,11	6,48	3,21	5,97	3,29	
	-2	8,38	2,48	8,17	2,68	7,82	2,89	7,60	3,04	7,19	3,14	6,57	3,24	
	2	8,97	2,42	8,71	2,61	8,35	2,81	8,12	2,97	7,89	3,08	7,16	3,20	
	7	10,17	2,35	10,02	2,54	9,81	2,74	9,53	2,96	9,04	3,07	8,50	3,16	
	12	11,04	2,32	10,76	2,49	10,48	2,70	10,05	2,92	9,61	3,05	9,03	3,15	
	15	12,04	2,28	11,72	2,44	11,35	2,66	10,92	2,89	10,38	3,03	9,76	3,15	
	20	13,81	2,25	13,46	2,38	13,01	2,62	12,52	2,85	11,87	3,01	11,17	3,15	

MAXIMUM HEATING CAPACITY - INTEGRATED VALUE

	LWC [°C]	30		35		40		45		50		55		
		T _{amb} [°C]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]	HC [kW]	PI [kW]
RLQ004	-20	2,26	1,53	2,24	1,74	2,20	1,91	2,16	2,13	2,08	2,34			
	-15	3,30	1,53	3,11	1,73	3,17	1,90	2,93	2,15	2,86	2,34	2,64	2,44	
	-7	4,70	1,53	4,60	1,70	4,51	1,88	4,34	2,07	4,08	2,29	3,81	2,41	
	-2	4,84	1,36	4,76	1,52	4,63	1,71	4,53	1,88	4,28	2,11	4,10	2,22	
	2	4,90	1,19	4,81	1,34	4,69	1,54	4,60	1,70	4,42	1,93	4,27	2,02	
	7	5,25	0,99	5,12	1,12	5,00	1,31	4,90	1,44	4,70	1,66	4,54	1,76	
	12	5,29	0,77	5,20	0,86	5,05	1,01	4,91	1,21	4,73	1,47	4,57	1,52	
	15	5,47	0,76	5,29	0,81	5,16	0,98	5,06	1,20	4,76	1,37	4,63	1,48	
	20	6,02	0,74	5,85	0,81	5,73	0,96	5,51	1,13	5,18	1,32	4,89	1,45	
RLQ006	-20	3,16	1,89	3,11	2,12	2,93	2,37	2,75	2,50	2,71	2,59			
	-15	4,13	1,86	4,01	2,07	3,77	2,30	3,60	2,45	3,54	2,52	3,26	2,55	
	-7	5,48	1,81	5,34	2,02	5,29	2,22	5,21	2,38	4,99	2,45	4,58	2,52	
	-2	6,15	1,79	6,08	1,96	6,04	2,14	5,69	2,28	5,58	2,37	5,14	2,46	
	2	6,58	1,76	6,40	1,90	6,19	2,06	6,07	2,19	5,97	2,29	5,49	2,40	
	7	8,48	1,84	8,35	1,99	8,17	2,15	7,95	2,32	7,53	2,40	7,08	2,48	
	12	9,20	1,82	8,97	1,95	8,73	2,11	8,37	2,29	8,01	2,39	7,52	2,47	
	15	10,03	1,79	9,77	1,91	9,46	2,08	9,10	2,26	8,65	2,37	8,14	2,47	
	20	11,51	1,76	11,21	1,87	10,85	2,05	10,44	2,24	9,89	2,36	9,31	2,47	
RLQ008	-20	3,79	2,41	3,73	2,71	3,51	3,03	3,29	3,19	3,25	3,30			
	-15	4,96	2,38	4,81	2,64	4,52	2,93	4,33	3,12	4,24	3,21	3,92	3,26	
	-7	6,57	2,31	6,41	2,58	6,35	2,83	6,25	3,03	5,99	3,13	5,50	3,21	
	-2	7,38	2,28	7,29	2,50	7,25	2,73	6,82	2,91	6,70	3,02	6,16	3,14	
	2	7,90	2,25	7,68	2,42	7,43	2,63	7,28	2,79	7,16	2,92	6,59	3,06	
	7	10,17	2,35	10,02	2,54	9,81	2,74	9,53	2,96	9,04	3,07	8,50	3,16	
	12	11,04	2,32	10,76	2,49	10,48	2,70	10,05	2,92	9,61	3,05	9,03	3,15	
	15	12,04	2,28	11,72	2,44	11,35	2,66	10,92	2,89	10,38	3,03	9,76	3,15	
	20	13,81	2,25	13,46	2,38	13,01	2,62	12,52	2,85	11,87	3,01	11,17	3,15	

Symbols :

CC	Cooling capacity at maximum operating frequency, measured acc. standard EN 14511
HC	Heating capacity at maximum operating frequency, measured acc. standard EN 14511
PI	Power input, measured acc. EN 14511
LWE	Leaving Water Evaporator temperature
LWC	Leaving Water Condensor temperature
Tamb	Ambient temperature; RH (heating) = 85%

Conditions :

- Cooling capacity
Capacity is according to standard EN 14511 and valid for chilled water range $\Delta T = 3-8^{\circ}\text{C}$
→ Capacity values may not be extrapolated below 7°C leaving water temperature
- Heating capacity
Capacity is according to standard EN 14511 and valid for heated water range $\Delta T = 3-8^{\circ}\text{C}$
- Power input
Power input is total input of indoor and outdoor unit, inclusive the circulation pump; according to standard EN 14511

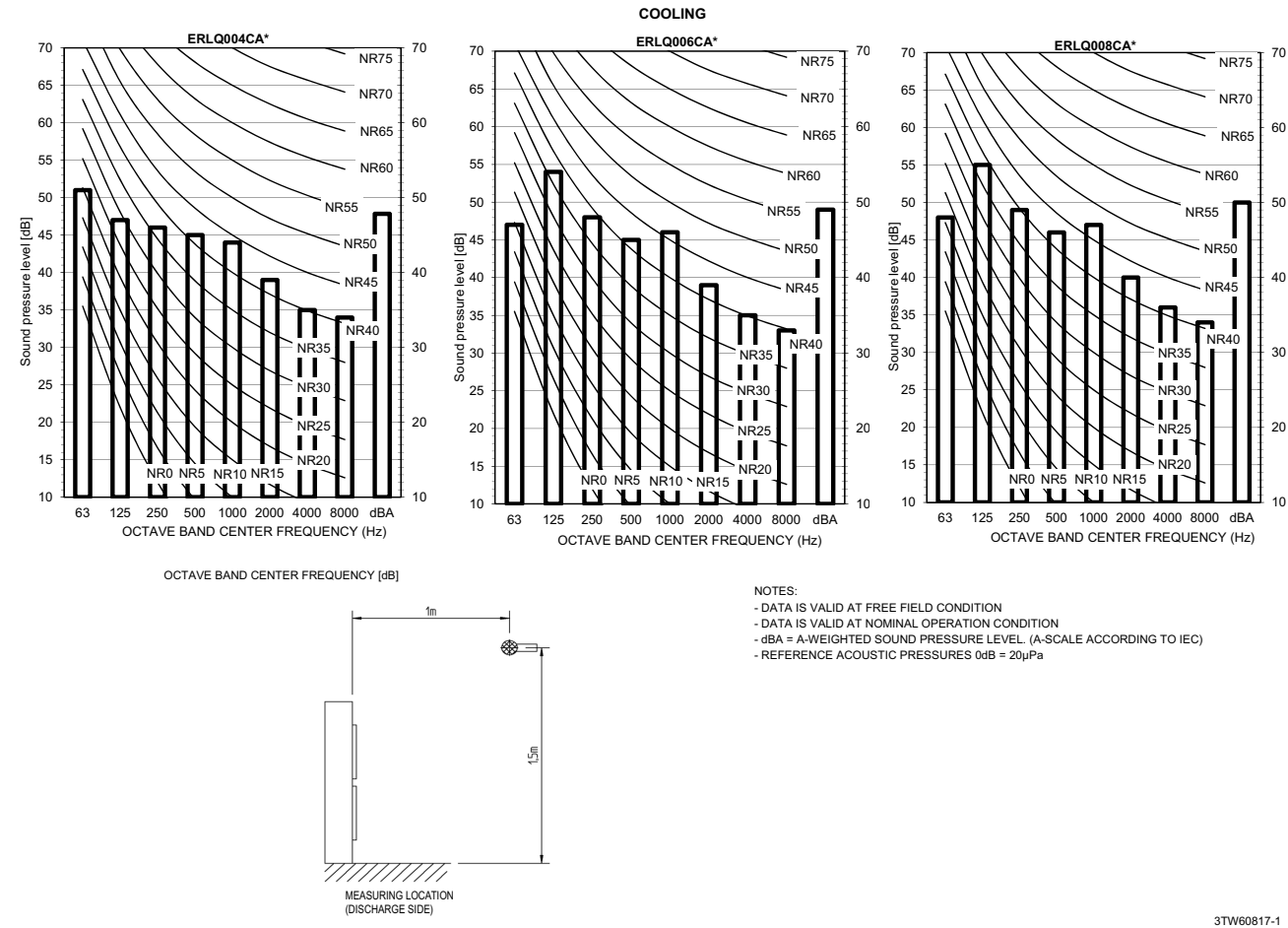
Notes:

- The capacity and power input is valid for V3-models at 230V.
- The capacity and power input is at maximum operation

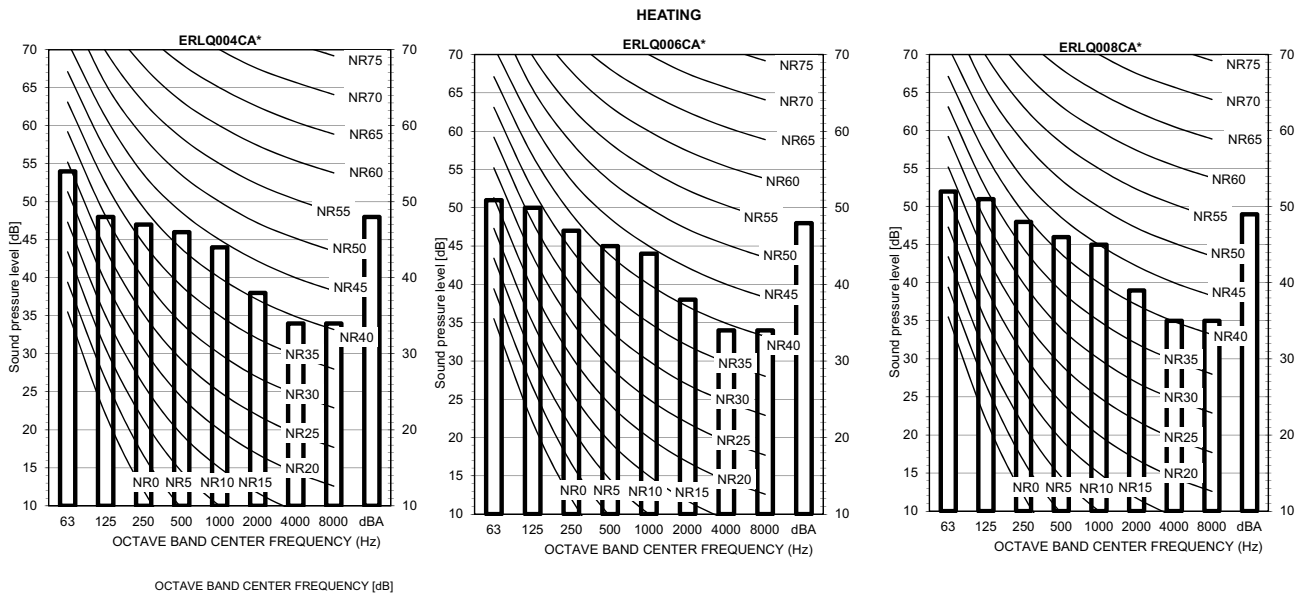
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15.10 Sound spectrum

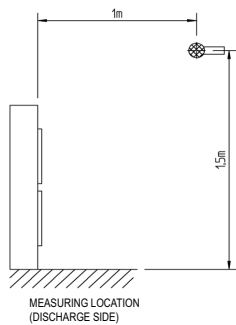
15.10.1 Sound spectrum: Outdoor unit



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OCTAVE BAND CENTER FREQUENCY [dB]



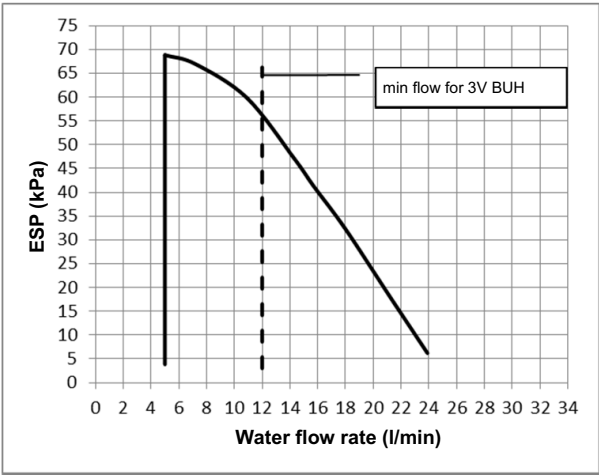
NOTES:
- DATA IS VALID AT FREE FIELD CONDITION
- DATA IS VALID AT NOMINAL OPERATION CONDITION
- dBA = A-WEIGHTED SOUND PRESSURE LEVEL. (A-SCALE ACCORDING TO IEC)
- REFERENCE ACOUSTIC PRESSURES 0dB = 20μPa

3TW60817-2

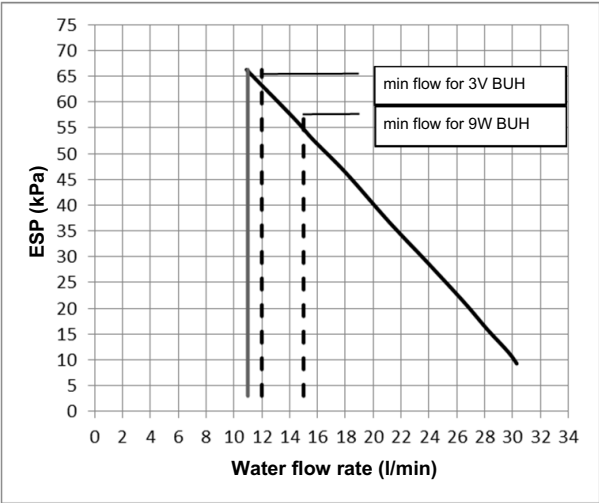
15.11 ESP curve

15.11.1 ESP curve: Indoor unit

EHB(H/X)04CA3V



EHB(H/X)08CA3V
EHB(H/X)08CA9W



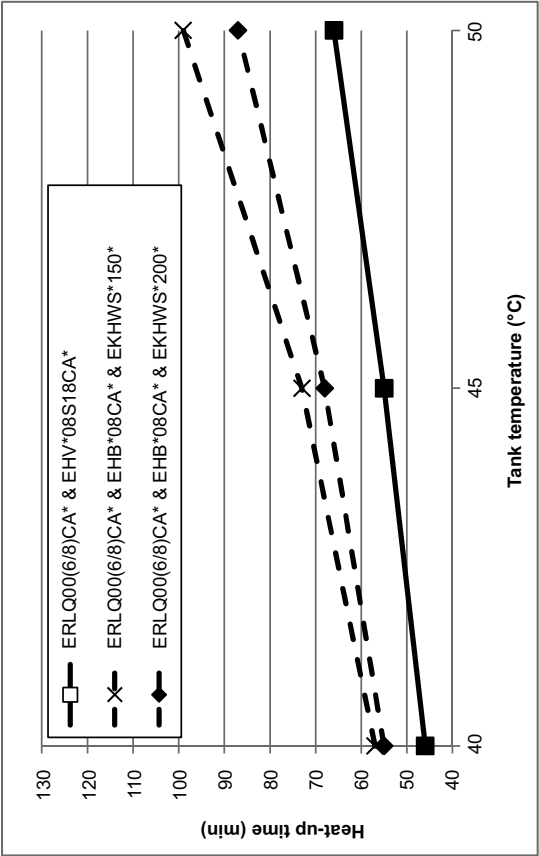
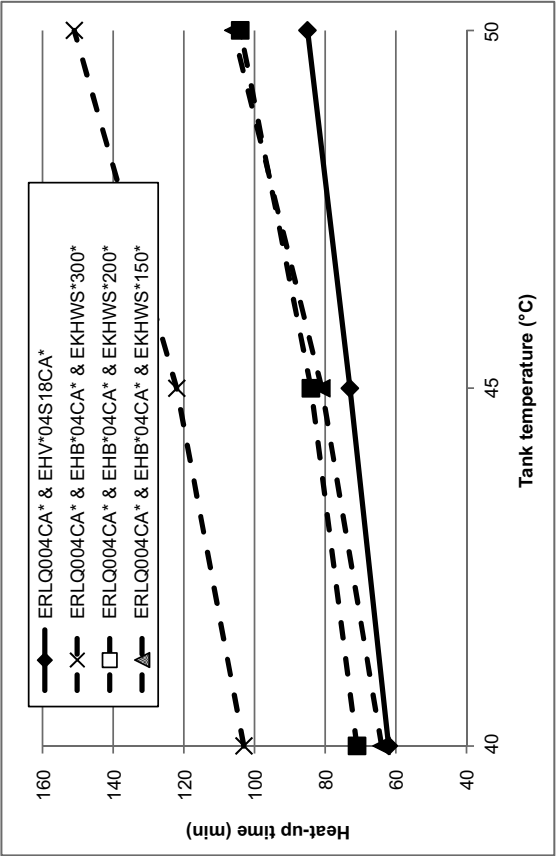
ESP : External Static Pressure
Flow : Waterflow through the unit

- 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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15.12 Performance

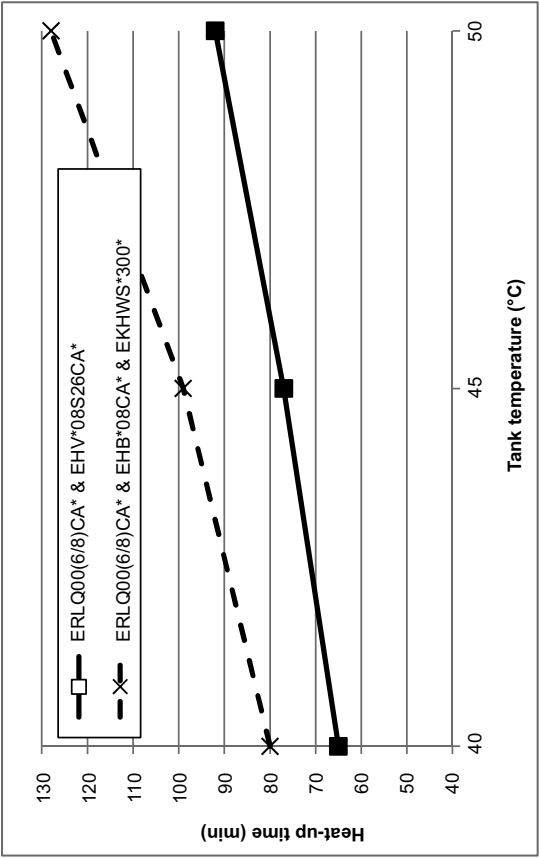
Heat up times GBS (1) :



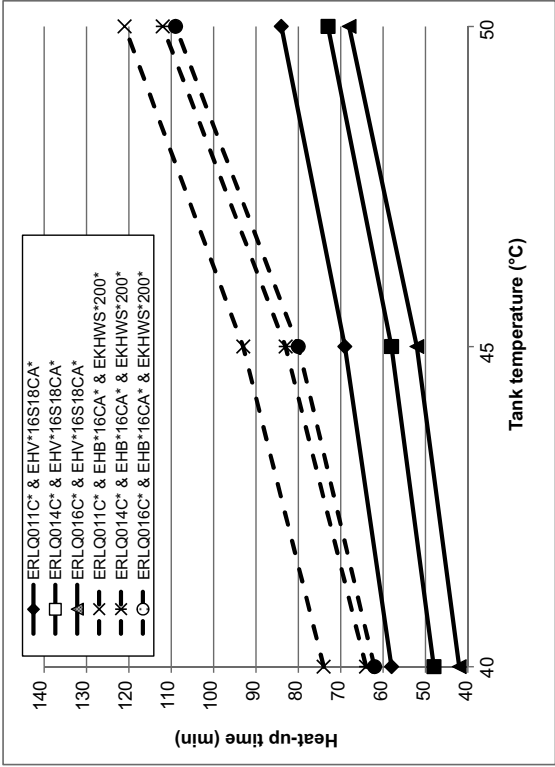
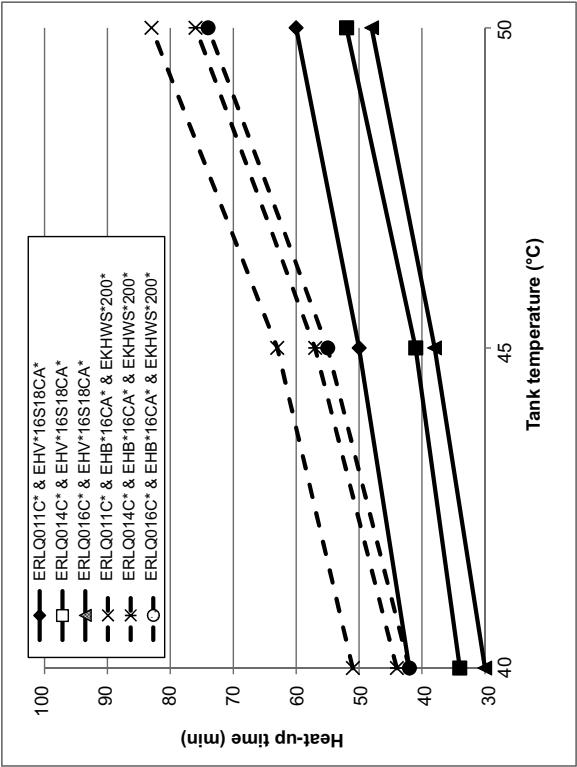
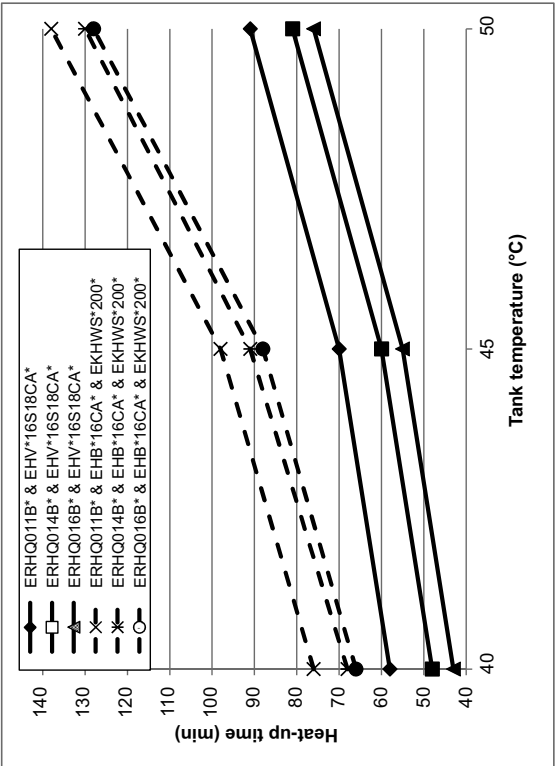
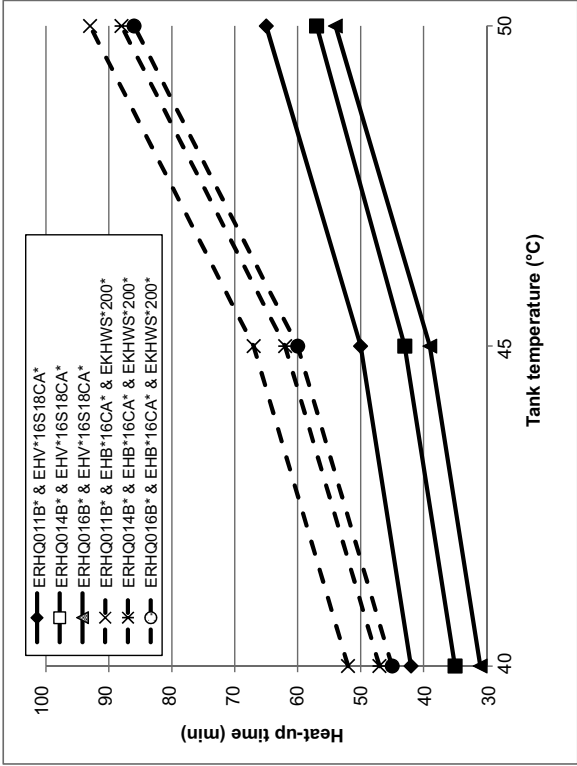
Notes:

- (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

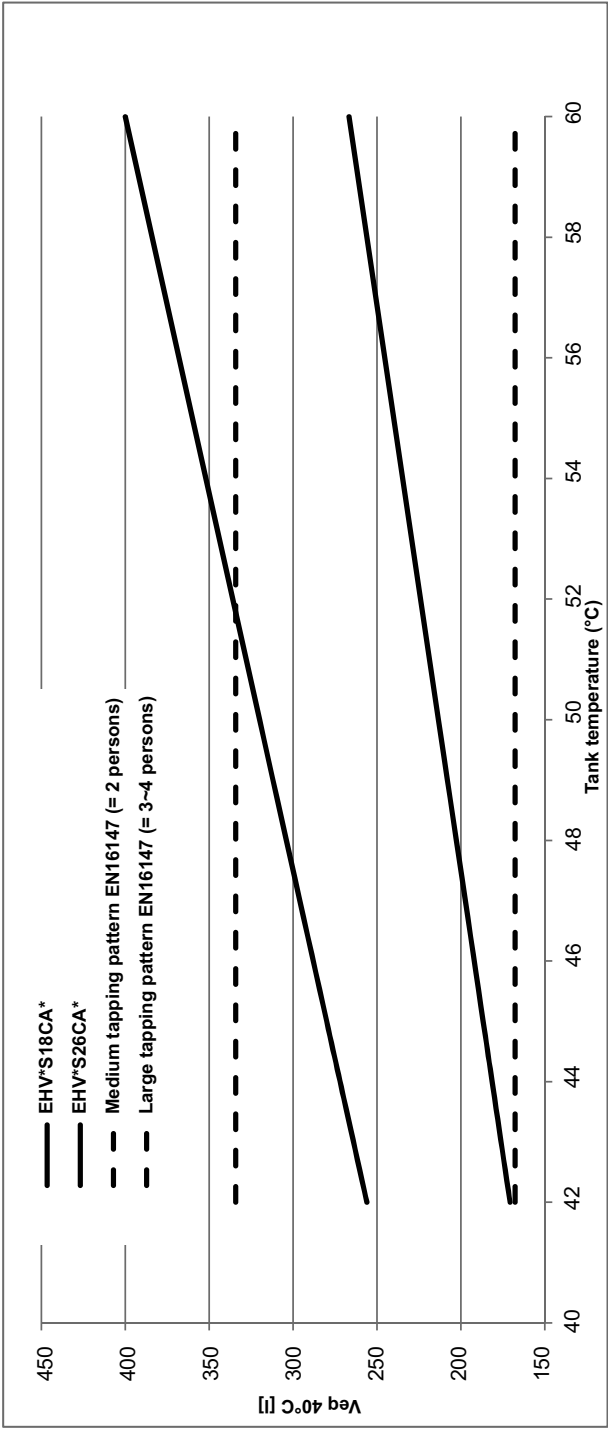
Notes:

(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*	180l
	260l
	1,38
	1,91

Tank	Heat loss [kWh/24h]
EKHWS*	150l
	200l
	300l
	1,55
	1,77
	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

15 Technical data

15.13 Certification programs

RATED DATA FOR CERTIFICATION PROGRAMS - HEATING MODE

		Certification program	Ta [°C]	EW [°C]	LWC [°C]	HC [kW]	COP	Min. Required COP Vivrelec	Min. Required COP Crédit d'impôt	Min. Required COP NF PAC	Min. Required COP EHPA	Min. Required COP Ecolabel	Min. Required COP SEI	Min. Required COP microgeneration
RLQ004	Floor	EHPA	10/8	30	35	4,47	5,12	4,00	-	-	-	-	-	-
		Crédit d'impôt, NF PAC, Microgeneration	7/6	30	35	4,40	5,04	4,00	3,40	3,40	-	-	-	3,20
		EHPA, SEI, Ecolabel	2/1		35	3,27	4,02	-	-	-	3,10	3,10	3,00	-
		NF PAC	-7/-8		35	4,37	2,81	2,00	-	2,10	-	-	-	-
	Fan Coil	NF PAC	7/6	40	45	4,03	3,58	2,50	-	2,70	-	-	-	-
		Ecolabel	2/1		45	3,97	2,77	1,50	-	-	-	2,60	-	-
		NF PAC	-7/-8		45	4,20	2,27	1,50	-	1,60	-	-	-	-
RLQ006	Floor	EHPA	10/8	30	35	6,25	5,07	4,00	-	-	-	-	-	-
		Crédit d'impôt, NF PAC, Microgeneration	7/6	30	35	6,00	4,74	4,00	3,40	3,40	-	-	-	3,20
		EHPA, SEI, Ecolabel	2/1		35	4,58	3,66	-	-	-	3,10	3,10	3,00	-
		NF PAC	-7/-8		35	5,31	2,84	2,00	-	2,10	-	-	-	-
	Fan Coil	NF PAC	7/6	40	45	5,67	3,56	2,50	-	2,70	-	-	-	-
		Ecolabel	2/1		45	5,69	2,81	1,50	-	-	-	2,60	-	-
		NF PAC	-7/-8		45	5,12	2,22	1,50	-	1,60	-	-	-	-
RLQ008	Floor	EHPA	10/8	30	35	7,39	4,75	4,00	-	-	-	-	-	-
		Crédit d'impôt, NF PAC, Microgeneration	7/6	30	35	7,40	4,45	4,00	3,40	3,40	-	-	-	3,20
		EHPA, SEI, Ecolabel	2/1		35	5,80	3,53	-	-	-	3,10	3,10	3,00	-
		NF PAC	-7/-8		35	5,46	2,71	2,00	-	2,10	-	-	-	-
	Fan Coil	NF PAC	7/6	40	45	6,89	3,42	2,50	-	2,70	-	-	-	-
		Ecolabel	2/1		45	6,08	2,63		-	-	-	2,60	-	-
		NF PAC	-7/-8		45	6,13	2,12	1,50	-	1,60	-	-	-	-

RATED DATA FOR CERTIFICATION PROGRAMS - COOLING MODE

		Certification program	Ta [°C]	EW [°C]	LWC [°C]	CC [kW]	EER	Min. Required EER Vivrelec	Min. Required EER Ecolabel					
RLQ004	Floor	Ecolabel	35	23	18	5,00	3,37	2,20	2,20	-	-	-	-	-
	Fan Coil	Ecolabel	35	12	7	4,17	2,32	2,20	2,20	-	-	-	-	-
RLQ006	Floor	Ecolabel	35	23	18	6,76	3,45	2,20	2,20	-	-	-	-	-
	Fan Coil	Ecolabel	35	12	7	4,84	2,34	2,20	2,20	-	-	-	-	-
RLQ008	Floor	Ecolabel	35	23	18	6,86	3,42	2,20	2,20	-	-	-	-	-
	Fan Coil	Ecolabel	35	12	7	5,36	2,29	2,20	2,20	-	-	-	-	-

SOUND POWER MEASUREMENTS

		Certification program	Required setup of unit for test	Ta [°C]	EW [°C]	LW [°C]	Mode	dBA
EHB(H/X)008*	EHV(H/X)008*	Promotelec, Ecolabel, Eurovent	Nominal	35	12	7	cooling	40 42
EHB(H/X)008*	EHV(H/X)008*	NF PAC, Ecolabel	Nominal	7/6	30	35	heating	40 42

Symbols :

CC Cooling capacity at maximum operating frequency, measured acc. EN14511
 HC Heating capacity at maximum operating frequency, measured acc. EN14511
 COP/EER Coefficient of Performance/Energy efficiency ratio acc. EN14511
 LWE Leaving Water Evaporator temperature [°C]
 LWC Leaving Water Condensor temperature [°C]
 Ta Ambient temperature [°C] DB/WB

3TW60819-3A

15.14 Combination table

Factory mounted optional equipment for *HB(H/X)04/08/16CA#

Description		#					
		*HB(H/X)04CA	*HB(H/X)08/16CA				
Heating only model	*HBH*	3V	-	3V	-	9W (9)	-
Reversible model	*HBX*	-	3V	-	3V	-	9W (9)
Back up heater 3kW IN-230 V		0	0	0	0	0	0
Back up heater 6kW IN-230 V		-	-	-	-	0	0
Back up heater 6kW 3N-400 V		-	-	-	-	0	0
Back up heater 9kW 3-230 V		-	-	-	-	0	0
Back up heater 9kW 3N-400 V		-	-	-	-	5	0

Kit availability for outdoor units

[illegible]

Kit availability

Reference	Description	#				
	Heating only model "HBH+" Reversible model "HBX"	3V3		9V1N		9V1N
		Availability TBC				
		o	o	o	o	o
KRSCA1	Remote sensor for outdoor (15)					o (*)
KRCS01-1	Remote sensor for indoor (15)					o (*)
KRUCAL1	User interface language group 1					o (*)
KRUCAL2	User interface language group 2	o	o	o	o	o
	Domestic hot water tank 150 l 1-230 V	o	o	o (*)		o (*)
	Domestic hot water tank 200 l 1-230 V	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V (7)	o	o	o	o	o
	Domestic hot water tank 200 l 2-400 V (7)	o	o	o	o	o
	Domestic hot water tank 300 l 2-400 V (7)	o	o	o	o	o
	Domestic hot water tank 150 l 1-230 V (only for UK)	o	o	o (*)		o (*)
	Domestic hot water tank 200 l 1-230 V (only for UK)	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V (only for UK)	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V (7)	o	o	o (*)		o (*)
	Domestic hot water tank 150 l 1-230 V (7)	o	o	o (*)		o (*)
	Domestic hot water tank 200 l 1-230 V (7)	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V (7)	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V (7)	o	o	o (*)		o (*)
	Domestic hot water tank 300 l 1-230 V (7)	o	o	o (*)		o (*)
		Option kit for condensate free cooling operation	-	o	-	
Digital I/O PCB (2)		o	o	-		o
Demand PCB (6)		o	o	-		o
Wired room thermostat option kit		o	o	-		o
Wireless room thermostat option kit (incl. receiver)		o	o	-		o
external temperature sensor option kit (4)		o	o	-		o
		o	o	-		o
KRFXV15AVEB	Heat pump convector	o	o (5)	o	o	o (5)
KRFXV20AVEB	Heat pump convector	o	o (5)	o	o	o (5)
KVKHPC	Valve kit heat pump convector (5)	o	o (5)	o	o	o (5)
Availability TBC		Availability TBC				

Outdoor combination table for *HB(H/X)04/08/16CA#

		RLO 004CA V3	*RLO 006CA V3*	*RLO 008CA V3*	*RHQ 011B(V3/W1)	*RHQ 014B(V3/W1)	*RHQ 016B(V3/W1)	*RLO 011C(V3/W1)	*RLO 014C(V3/W1)	*RLO 016C(V3/W1)
"HBH04CA"	Heating only	O								
"HBX04CA"	Reversible	O								
"HHB08CA"	Heating only		O							
"HBX08CA"	Reversible		O							
"HBH16CA"	Heating only			O	O	O	O	O	O	O
"HBX16CA"	Reversible				O			O		O

Kit availability for *KHW*

Reference	Description	#					
	*KHWET#3(V3/Z2)	150A	200/300A				
	*KHW#3(V3/Z2)			150(A/B)	200/300(A/B)		
	*KHW#SU#3V3					150A	200/300A
						150B	200/300B
KUHWA	Option kit for UK *KHW#SU150-300*3V3	-	-	-	-	o	o
KUHWB	Option kit 1 for UK *KHW#SU150-300*3V3 (13)	-	-	-	-	o(11)	o
KUHW2WB	Option kit 2 for UK *KHW#SU150-300*3V3 (13)	-	-	-	-	o(11)	o(12)
KUSOLHWA/V1	Solarkit (10)	-	o	o	o	o	o
KWBSWW150	Wall bracket for *KHW#SU150(*) 3V3 or *KSWW150V3*	-	-	o	-	o	-

Kit availability for *KSOLHWAV1

EKSR3PA	Solar station controller
EKSRDS1A	Solar pump station

- (*) if neutral line is available
- (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 OR bottom plate heater "KBPHTH16" control
 - (c) Remote alarm output
- (d) Solar pump connection. In "KSOLHWAV1, option kit "KRP1HB is already included.
- (3) It is not allowed to combine bottom plate heater and drain plug/stop kit
- (4) "KRTEts can only be used in combination with "KRTR1
- (5) Valve kit mandatory if heat pump convactor 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
- (7) Combination possibility depends on available power supply type
- (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) Kit to be mounted on domestic hot water tank that provides connection to solar panels for additional water heating
- (11) If installation on tank A version both kits are required
- (12) Kit is only necessary when installing "KSOLHWAV1 on a UK tank B-series ("KHWSU(150/200/300)B3V3)
- (13) "KUHWB = "KUHWA - (2 way valve and 2 way valve accessories)
"KUHW2WB = 2 way valve and 2 way valve accessories
- (14) Requires digital I/O PCB "KRP1HBAA
- (15) Only 1 sensor can be connected : indoor OR outdoor sensor
- (16) Data cable for connection with PC

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

