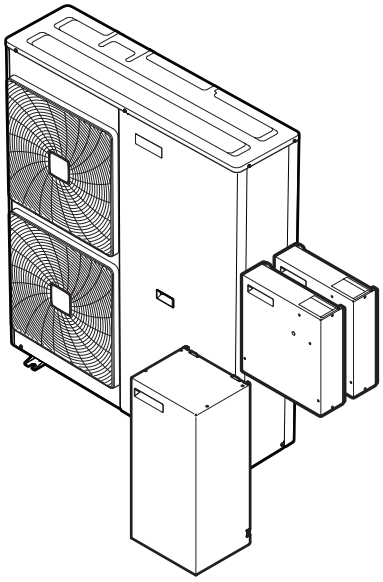
Installer reference guide

Daikin Altherma low temperature monobloc



EBLQ011CAV3
EBLQ014CAV3
EBLQ016CAV3
EBLQ011CAW1
EBLQ014CAW1
EBLQ016CAW1

EDLQ011CAV3
EDLQ014CAV3
EDLQ016CAV3
EDLQ011CAW1
EDLQ014CAW1
EDLQ016CAW1

EKCB07CAV3
EK2CB07CAV3

EKMBUHCA3V3
EKMBUHCA9W1

Table of Contents

1 General safety precautions 3
1.1 About the documentation 3
1.1.1 Meaning of warnings and symbols 3
1.2 For the installer 4
1.2.1 General 4
1.2.2 Installation site 4
1.2.3 Refrigerant 4
1.2.4 Brine 5
1.2.5 Water 5
1.2.6 Electrical 6

2 About the documentation 6
2.1 About this document 6
2.2 Installer reference guide at a glance 7

3 About the box 7
3.1 Overview: About the box 7
3.2 Outdoor unit 7
3.2.1 To unpack the outdoor unit 7
3.2.2 To handle the outdoor unit 8
3.2.3 To remove the accessories from the outdoor unit 8
3.3 Control box 8
3.3.1 To unpack the control box 8
3.3.2 To remove the accessories from the control box 9
3.4 Option box 9
3.4.1 To unpack the option box 9
3.4.2 To remove the accessories from the option box 9
3.5 Backup heater 9
3.5.1 To unpack the backup heater 9
3.5.2 To remove the accessories from the backup heater 10

4 About the units and options 10
4.1 Overview: About the units and options 10
4.2 Identification 10
4.2.1 Identification label: Outdoor unit 10
4.2.2 Identification label: Control box 10
4.2.3 Identification label: Option box 10
4.2.4 Identification label: Backup heater 11
4.3 Combining units and options 11
4.3.1 Possible combinations of outdoor unit and options 11
4.3.2 Possible options for the outdoor unit 12
4.3.3 Possible options for the control box 13
4.3.4 Possible options for the option box 13

5 Application guidelines 13
5.1 Overview: Application guidelines 13
5.2 Setting up the space heating/cooling system 14
5.2.1 Single room 14
5.2.2 Multiple rooms – One LWT zone 16
5.2.3 Multiple rooms – Two LWT zones 18
5.3 Setting up an auxiliary heat source for space heating 19
5.4 Setting up the domestic hot water tank 20
5.4.1 System layout – Standalone DHW tank 20
5.4.2 Selecting the volume and desired temperature for the DHW tank 20
5.4.3 Setup and configuration – DHW tank 21
5.4.4 DHW pump for instant hot water 21
5.4.5 DHW pump for disinfection 21
5.4.6 DHW pump for tank preheating 21
5.5 Setting up the energy metering 22
5.5.1 Produced heat 22
5.5.2 Consumed energy 22
5.5.3 Normal kWh rate power supply 22
5.5.4 Preferential kWh rate power supply 23
5.6 Setting up an external temperature sensor 23

6 Preparation 24
6.1 Overview: Preparation 24
6.2 Preparing the installation site 24
6.2.1 Installation site requirements of the outdoor unit 24
6.2.2 Additional installation site requirements of the outdoor unit in cold climates 25
6.2.3 Installation site requirements of the control box 25
6.2.4 Installation site requirements of the option box 25
6.2.5 Installation site requirements of the backup heater 26
6.3 Preparing water piping 26
6.3.1 Water circuit requirements 26
6.3.2 Formula to calculate the expansion vessel pre-pressure 27
6.3.3 To check the water volume and flow rate 27
6.3.4 Changing the pre-pressure of the expansion vessel 29
6.3.5 To check the water volume: Examples 29
6.4 Preparing electrical wiring 29
6.4.1 About preparing electrical wiring 29
6.4.2 About preferential kWh rate power supply 29
6.4.3 Overview of electrical connections except external actuators 29
6.4.4 Overview of electrical connections for external and internal actuators 30

7 Installation 31
7.1 Overview: Installation 31
7.2 Opening the units 32
7.2.1 About opening the units 32
7.2.2 To open the outdoor unit 32
7.2.3 To open the switch box cover of the outdoor unit 32
7.2.4 To open the control box 32
7.2.5 To open the option box 32
7.2.6 To open the backup heater 33
7.2.7 To open the switch box cover of the backup heater 33
7.3 Mounting the outdoor unit 33
7.3.1 About mounting the outdoor unit 33
7.3.2 Precautions when mounting the outdoor unit 33
7.3.3 To provide the installation structure 33
7.3.4 To install the outdoor unit 34
7.3.5 To provide drainage 34
7.3.6 To prevent the outdoor unit from falling over 34
7.4 Mounting the control box 35
7.4.1 Precautions when mounting the control box 35
7.4.2 To install the control box 35
7.5 Mounting the option box 35
7.5.1 Precautions when mounting the option box 35
7.5.2 To install the option box 35
7.6 Mounting the backup heater 35
7.6.1 About mounting the backup heater 35
7.6.2 Precautions when mounting the backup heater 35
7.6.3 To install the backup heater 35
7.7 Connecting the water piping 36
7.7.1 About connecting the water piping 36
7.7.2 Precautions when connecting the water piping 36
7.7.3 To connect the water piping 36
7.7.4 To connect the water piping to the backup heater 37
7.7.5 About the valve kit 37
7.7.6 To protect the water circuit against freezing 38
7.7.7 To fill the water circuit 39
7.7.8 To fill the domestic hot water tank 40
7.7.9 To insulate the water piping 40
7.8 Connecting the electrical wiring 40
7.8.1 About connecting the electrical wiring 40
7.8.2 Precautions when connecting the electrical wiring 40
7.8.3 Guidelines when connecting the electrical wiring 40
7.8.4 To connect the electrical wiring on the outdoor unit 41
7.8.5 To connect the main power supply 41
7.8.6 To connect the user interface 42
7.8.7 To connect the shut-off valve 44
7.8.8 To connect the domestic hot water pump 44

7.8.9 To connect the electrical wiring on the control box 45
7.8.10 To connect the control box power supply 45
7.8.11 To connect the interconnection cable between control box and outdoor unit 45
7.8.12 To connect the electrical wiring on the option box 45
7.8.13 To connect the option box power supply 45
7.8.14 To connect the interconnection cable between option box and control box 46
7.8.15 To connect the electrical meters 46
7.8.16 To connect the alarm output 46
7.8.17 To connect the space cooling/heating ON/OFF output 46
7.8.18 To connect the changeover to external heat source 47
7.8.19 To connect the electrical wiring on the backup heater 47
7.8.20 To connect the backup heater power supply 47
7.8.21 To connect the backup heater kit to the control box 48
7.8.22 To connect the valve kit 49
7.9 Finishing the outdoor unit installation 50
7.9.1 To close the outdoor unit 50
7.10 Finishing the control box installation 50
7.10.1 To close the control box 50
7.11 Finishing the option box installation 50
7.11.1 To close the option box 50
7.12 Finishing the backup heater installation 50
7.12.1 To close the backup heater 50

8 Configuration 50
8.1 Overview: Configuration 50
8.1.1 To connect the PC cable to the switch box 50
8.1.2 To access the most used commands 51
8.1.3 To copy the system settings from the first to the second user interface 51
8.1.4 To copy the language set from the first to the second user interface 52
8.1.5 Quick wizard: Set the system layout after first power ON 52
8.2 Basic configuration 52
8.2.1 Quick wizard: Language / time and date 52
8.2.2 Quick wizard: Standard 52
8.2.3 Quick wizard: Options 54
8.2.4 Quick wizard: Capacities (energy metering) 56
8.2.5 Space heating/cooling control 57
8.2.6 Domestic hot water control 61
8.2.7 Contact/helpdesk number 61
8.3 Advanced configuration/optimization 61
8.3.1 Space heating/cooling operation: advanced 61
8.3.2 Domestic hot water control: advanced 65
8.3.3 Heat source settings 70
8.3.4 System settings 72
8.4 Menu structure: Overview user settings 75
8.5 Menu structure: Overview installer settings 76

9 Commissioning 77
9.1 Overview: Commissioning 77
9.2 Precautions when commissioning 77
9.3 Checklist before commissioning 77
9.4 Checklist during commissioning 77
9.4.1 To check the minimum flow rate 78
9.4.2 Air purge function 78
9.4.3 To perform a test run 79
9.4.4 To perform an actuator test run 79
9.4.5 Underfloor heating screed dryout 79

10 Hand-over to the user 81
10.1 About locking and unlocking 81
Possible function locks 81
To check if locking is active 81
To activate or deactivate a function lock 81
To activate or deactivate button lock 81

11 Maintenance and service 81
11.1 Overview: Maintenance and service 81
11.2 Maintenance safety precautions 81
11.2.1 Opening the outdoor unit 81
11.2.2 Opening the control box 81
11.2.3 Opening the option box 81
11.2.4 Opening the backup heater 82
11.3 Checklist for yearly maintenance of the outdoor unit 82

12 Troubleshooting 82
12.1 Overview: Troubleshooting 82
12.2 Precautions when troubleshooting 82
12.3 Solving problems based on symptoms 83
12.3.1 Symptom: The unit is NOT heating or cooling as expected 83
12.3.2 Symptom: The compressor does NOT start (space heating or domestic water heating) 83
12.3.3 Symptom: The pump is making noise (cavitation) 83
12.3.4 Symptom: The pressure relief valve opens 84
12.3.5 Symptom: The water pressure relief valve leaks 84
12.3.6 Symptom: The space is NOT sufficiently heated at low outdoor temperatures 84
12.3.7 Symptom: The pressure at the tapping point is temporarily unusually high 84
12.3.8 Symptom: Decoration panels are pushed away due to a swollen tank 84
12.3.9 Symptom: Tank disinfection function is NOT completed correctly (AH-error) 84
12.3.10 Symptom: The energy metering (produced heat) is NOT working correctly 85
12.4 Solving problems based on error codes 85
12.4.1 To display the help text in case of a malfunction 85
12.4.2 Error codes: Overview 85

13 Disposal 88
13.1 Overview: Disposal 88
13.2 To pump down 88
13.3 To start and stop forced cooling 89

14 Technical data 90
14.1 Service space: Outdoor unit 90
14.2 Piping diagram: Outdoor unit 91
14.3 Wiring diagram: Outdoor unit 91
14.4 Valve kit necessity 96
14.5 ESP curve: Outdoor unit 97

15 Glossary 98

16 Field settings table 99

1 General safety precautions

1.1 About the documentation

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

1.1.1 Meaning of warnings and symbols

DANGER
Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION
Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING

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

DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.

WARNING

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

WARNING: FLAMMABLE MATERIAL

CAUTION

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

NOTICE

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

INFORMATION

Indicates useful tips or additional information.

Symbol	Explanation
	Before installation, read the installation and operation manual, and the wiring instruction sheet.
	Before performing maintenance and service tasks, read the service manual.
	For more information, see the installer and user reference guide.

1.2 For the installer

1.2.1 General

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

NOTICE

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

WARNING

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

CAUTION

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

WARNING

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

DANGER: RISK OF BURNING

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

WARNING

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

CAUTION

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

NOTICE

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

NOTICE

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

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

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

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

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

1.2.2 Installation site

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

Do NOT install the unit in the following places:

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

1.2.3 Refrigerant

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

NOTICE

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

NOTICE

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

WARNING

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

WARNING

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

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

DANGER: RISK OF EXPLOSION

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

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

WARNING

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

NOTICE

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

NOTICE

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

WARNING

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

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

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

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

CAUTION

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

1.2.4 Brine

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

1.2.5 Water

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

NOTICE

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

1.2.6 Electrical

DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 1 minute, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do NOT touch electrical components with wet hands.
- Do NOT leave the unit unattended when the service cover is removed.

WARNING

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

WARNING

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

NOTICE

Precautions when laying power wiring:

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

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

WARNING

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

NOTICE

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

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

2 About the documentation

2.1 About this document

Target audience

Authorised installers

Documentation set

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

- **General safety precautions:**
  - Safety instructions that you must read before installing
  - Format: Paper (in the box of the outdoor unit)
- **Outdoor unit installation manual:**
  - Installation instructions
  - Format: Paper (in the box of the outdoor unit)
- **Control box installation manual:**
  - Installation instructions
  - Format: Paper (in the box of the control box)

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

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

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

Technical engineering data

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

2.2 Installer reference guide at a glance

Chapter	Description
General safety precautions	Safety instructions that you must read before installing
About the documentation	What documentation exists for the installer
About the box	How to unpack the units and remove their accessories
About the units and options	▪ How to identify the units ▪ Possible combinations of units and options
Application guidelines	Various installation setups of the system
Preparation	What to do and know before going on-site
Installation	What to do and know to install the system
Configuration	What to do and know to configure the system after it is installed
Commissioning	What to do and know to commission the system after it is configured
Hand-over to the user	What to give and explain to the user
Maintenance and service	How to maintain and service the units
Troubleshooting	What to do in case of problems
Disposal	How to dispose of the system
Technical data	Specifications of the system
Glossary	Definition of terms
Field settings table	Table to be filled in by the installer, and kept for future reference **Note:** There is also an installer settings table in the user reference guide. This table has to be filled in by the installer and handed over to the user.

3 About the box

3.1 Overview: About the box

This chapter describes what you have to do after the boxes with the outdoor unit, control box, option box, and/or backup heater are delivered on-site.

It contains information about:

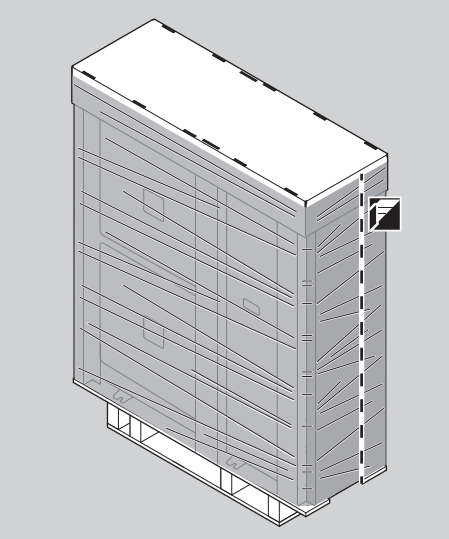
- Unpacking and handling the units
- Removing the accessories from the units

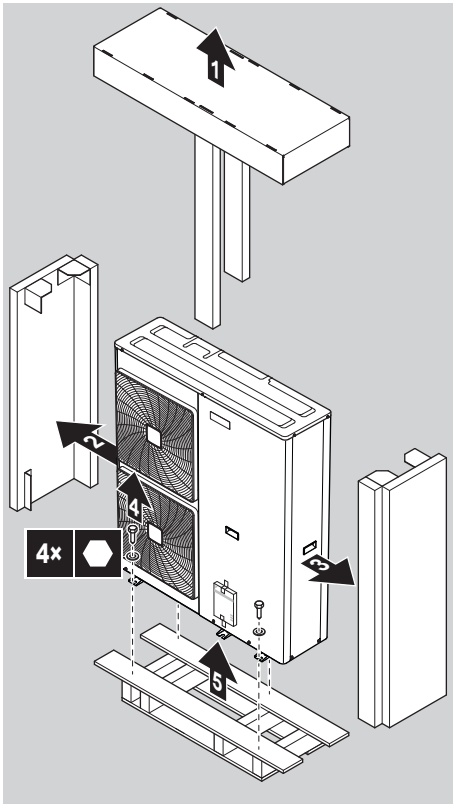
Keep the following in mind:

- At delivery, the unit MUST be checked for damage. Any damage MUST be reported immediately to the carrier's claims agent.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare the path along which you want to bring the unit inside in advance.

3.2 Outdoor unit

3.2.1 To unpack the outdoor unit



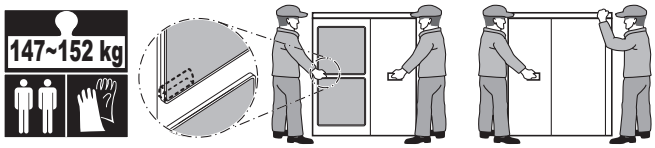


3.2.2 To handle the outdoor unit

CAUTION

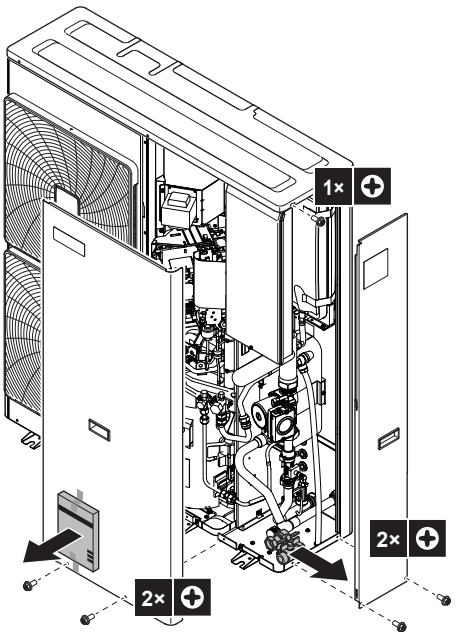
To avoid injury, do NOT touch the air inlet or aluminium fins of the unit.

Carry the unit slowly as shown:

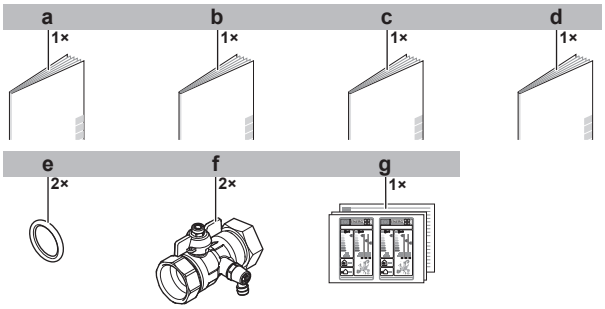


3.2.3 To remove the accessories from the outdoor unit

1 Open the outdoor unit.



2 Remove the accessories.



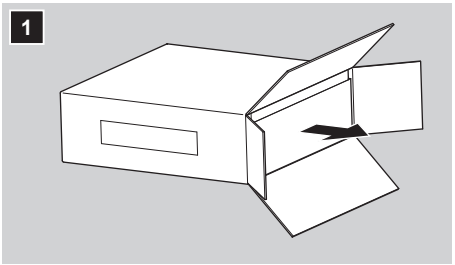
a General safety precautions
b Addendum book for optional equipment
c Outdoor unit installation manual
d Operation manual
e Sealing ring for shut-off valve
f Shut-off valve
g Energy label

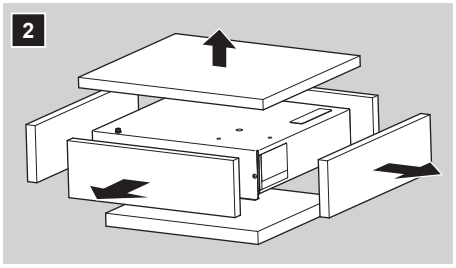
3.3 Control box

NOTICE

Control box EKCB07CAV3 is an option and cannot be used standalone.

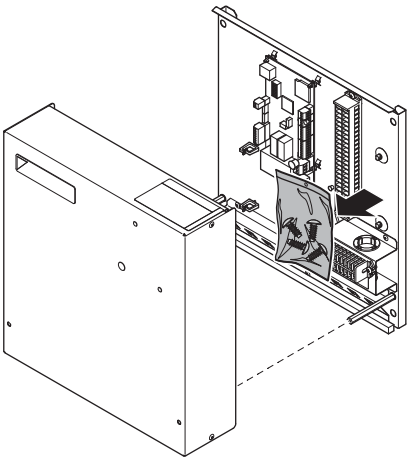
3.3.1 To unpack the control box



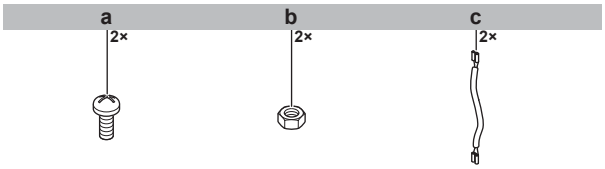


3.3.2 To remove the accessories from the control box

1 Open the control box.



2 Remove the accessories.



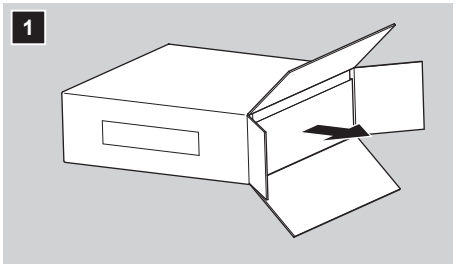
a M4 bolts for user interface
b M4 nuts for user interface
c Wires for domestic hot water booster heater relay

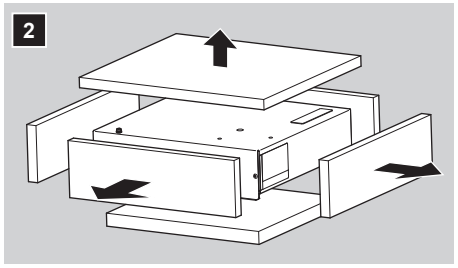
3.4 Option box

NOTICE

- Option box EK2CB07CAV3 is an option and cannot be used standalone.
- To be able to use the option box, it is required that optional control box EKCB07CAV3 is part of the system.

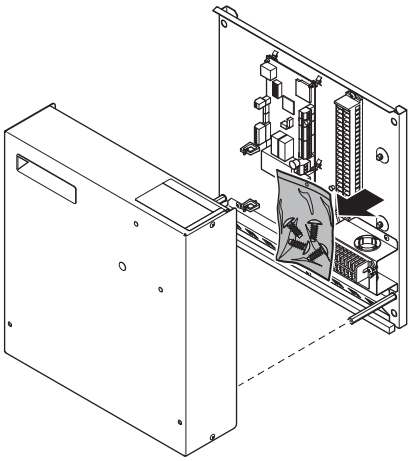
3.4.1 To unpack the option box



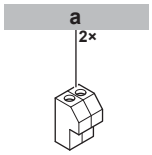


3.4.2 To remove the accessories from the option box

1 Open the option box.



2 Remove the accessories.



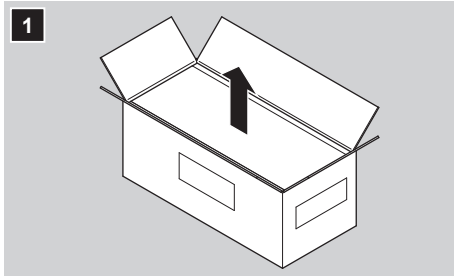
a Connectors for interconnection cable between the option box and control box EKCB07CAV3.

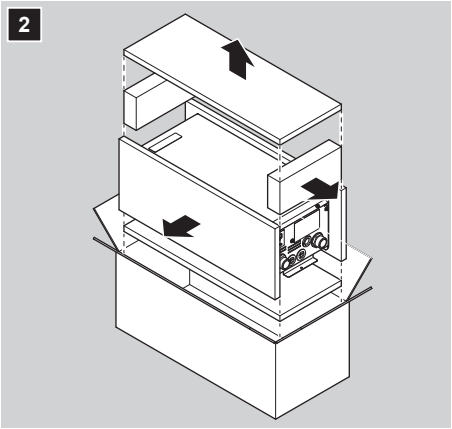
3.5 Backup heater

NOTICE

- The backup heater is an option and cannot be used standalone.
- To be able to use the backup heater, it is required that optional control box EKCB07CAV3 is part of the system.

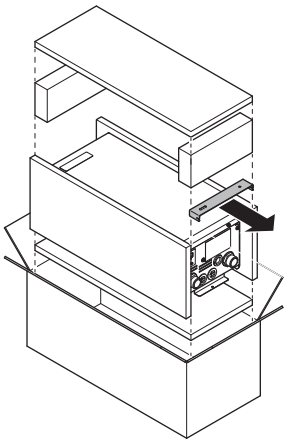
3.5.1 To unpack the backup heater





3.5.2 To remove the accessories from the backup heater

1 Remove the wall bracket from the box.



4 About the units and options

4.1 Overview: About the units and options

This chapter contains information about:

- Identifying the outdoor unit
- Identifying the control box (if applicable)
- Identifying the option box (if applicable)
- Identifying the backup heater (if applicable)
- Combining the outdoor unit with options
- Combining the control box with options
- Combining the option box with options
- Possible combinations of outdoor unit and domestic hot water tank

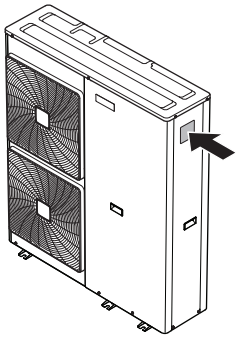
4.2 Identification

NOTICE

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

4.2.1 Identification label: Outdoor unit

Location



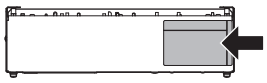
Model identification

Example: E B/D L Q 14 CA V3

Code	Explanation
E	Monobloc outdoor heat pump
B	B=Reversible (heating+cooling)
D	D=Heating only
L	Low water temperature – ambient zone: −10~−25°C
Q	Refrigerant R410A
14	Capacity class
CA	Model series
V3	Power supply: 1~, 220~240 V, 50 Hz
W1	Power supply: 3N~, 380~415 V, 50 Hz

4.2.2 Identification label: Control box

Location



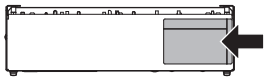
Model identification

Example: EK CB 07 CA V3

Code	Description
EK	European kit
CB	Control box
07	Capacity class
CA	Model series
V3	Power supply

4.2.3 Identification label: Option box

Location



Model identification

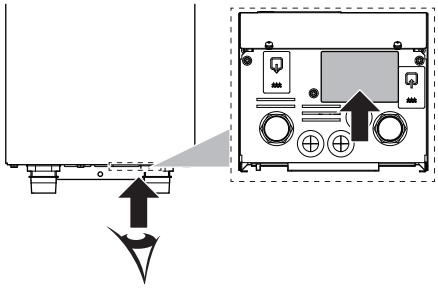
Example: EK 2 CB 07 CA V3

Code	Description
EK	European kit
2	Optional
CB	Control box
07	Capacity class
CA	Model series

Code	Description
V3	Power supply

4.2.4 Identification label: Backup heater

Location



Model identification

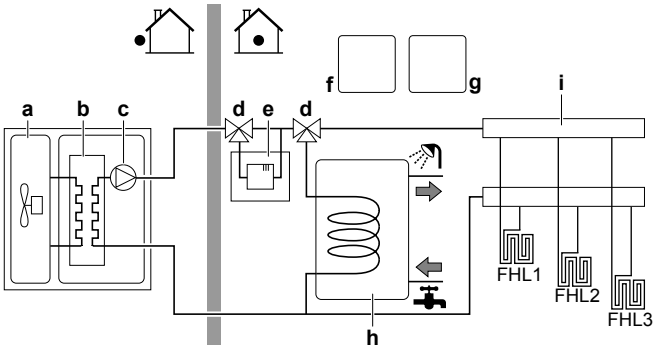
Example: EK M BUH CA 3 V3

Code	Explanation
EK	European kit
M	Designed for low temperature monobloc and air-cooled water chiller
BUH	Backup heater
CA	Model series
3	Capacity of heater kit (kW)

Code	Explanation
V3	Power supply

4.3 Combining units and options

4.3.1 Possible combinations of outdoor unit and options



a Outdoor unit (EBLQ+EDLQ011~016CAV3+W1)
b Refrigerant part of the outdoor unit
c Hydro part of the outdoor unit
d Valve kit EKMBHBP1
e Backup heater kit (EKMBUHCA3V3 or EKMBUHCA9W1)
f Control box EKCB07CAV3
g Option box EK2CB07CAV3
h Domestic hot water tank
i Space heating circuit

Option	System components required for that option			
	Outdoor unit EBLQ +EDLQ011~016CAV3+W1	Control box EKCB07CAV3	Option box EK2CB07CAV3	Valve kit EKMBHBP1
Optional equipment				
User interface (EKRUCBL*) (mandatory)	O			
Simplified user interface (EKRUCBS)	O			
Domestic hot water tank	O	O		O
Remote outdoor sensor (EKRSCA1)	O			
PC configurator (EKPCCAB)	O			
Room thermostat (EKRTWA, EKRTR1)	O	O		
Remote sensor for wireless thermostat (EKRTETS)	O	O		
Heat pump convector (FWXV)	O	O		
Backup heater kit (EKMBUHCA3V3, EKMBUHCA9W1)	O	O		O[(a)]
Remote indoor sensor (KRCS01-1)	O	O	O	
Field-supplied components				
Space heating/cooling operation control (or shut-off valve)	O			
Preferential kWh rate power supply (voltage-free contact)	O	O		
Domestic hot water pump	O	O		
Electric meter	O	O	O	
Alarm output	O	O	O	

Option	System components required for that option			
	Outdoor unit EBLQ +EDLQ011~016CAV3+W1	Control box EKCB07CAV3	Option box EK2CB07CAV3	Valve kit EKMBHBP1
Space cooling/heating ON/OFF output	O	O	O	
Changeover to external heat source	O	O	O	

(a) Only for EBLQ011+014+016CAV3 or EBLQ011+014+016CAW1.

4.3.2 Possible options for the outdoor unit

User interface (EKRUCBL*)

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

The additional user interface can be connected:

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

Following user interfaces are available:

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

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

For installation instructions, see "7.8.6 To connect the user interface" on page 42.

INFORMATION

- If control box EKCB07CAV3 is NOT part of the system, connect the user interface directly to the outdoor unit.
- If control box EKCB07CAV3 is part of the system, you can also connect the user interface to the control box.

Simplified user interface (EKRUCBS)

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

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

Domestic hot water tank

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

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

INFORMATION

- The domestic hot water tank can only be connected if control box EKCB07CAV3 and valve kit EKMBHBP1 is part of the system.
- The domestic hot water tank is connected to the hydro part of the outdoor unit, and wired to control box EKCB07CAV3.

Remote outdoor sensor (EKRSCA1)

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

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

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

INFORMATION

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

Heat pump convector (FWXV)

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

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

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

You can install this LAN adapter to:

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

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

INFORMATION

- If control box EKCB07CAV3 is NOT part of the system, connect the LAN adapter directly to the outdoor unit.
- If control box EKCB07CAV3 is part of the system, you can also connect the LAN adapter to the control box.

LAN adapter for smartphone control (BRP069A62)

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

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

INFORMATION

- If control box EKCB07CAV3 is NOT part of the system, connect the LAN adapter directly to the outdoor unit.
- If control box EKCB07CAV3 is part of the system, you can also connect the LAN adapter to the control box.

4.3.3 Possible options for the control box

User interface (EKRUCBL*)

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

The additional user interface can be connected:

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

Following user interfaces are available:

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

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

For installation instructions, see "7.8.6 To connect the user interface" on page 42.

INFORMATION

- If control box EKCB07CAV3 is NOT part of the system, connect the user interface directly to the outdoor unit.
- If control box EKCB07CAV3 is part of the system, you can also connect the user interface to the control box.

Simplified user interface (EKRUCBS)

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

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

Room thermostat (EKRTWA, EKRTR1, RTRNETA)

You can connect an optional room thermostat to control box EKCB07CAV3. This thermostat can either be wired (EKRTWA) or wireless (EKRTR1 and RTRNETA). Thermostat RTRNETA can only be used in heating-only systems.

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

Remote sensor for wireless thermostat (EKRTETS)

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

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

PC configurator (EKPCCAB)

The PC cable makes a connection between the switch box of the outdoor unit (or that of control box EKCB07CAV3) and a PC. It gives the possibility to upload different language files to the user interface, and parameters to the outdoor unit. For the available language files, contact your local dealer.

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

For installation instructions, see the installation manual of the PC cable, the "8 Configuration" on page 50 chapter, and the addendum book for optional equipment.

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

You can install this LAN adapter to:

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

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

INFORMATION

- If control box EKCB07CAV3 is NOT part of the system, connect the LAN adapter directly to the outdoor unit.
- If control box EKCB07CAV3 is part of the system, you can also connect the LAN adapter to the control box.

LAN adapter for smartphone control (BRP069A62)

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

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

INFORMATION

- If control box EKCB07CAV3 is NOT part of the system, connect the LAN adapter directly to the outdoor unit.
- If control box EKCB07CAV3 is part of the system, you can also connect the LAN adapter to the control box.

4.3.4 Possible options for the option box

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.

The remote indoor sensor is connected to option box EK2CB07CAV3. For installation instructions, see the installation manual of the remote indoor sensor and the 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.

5 Application guidelines

5.1 Overview: Application guidelines

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

NOTICE

- The illustrations in the application guidelines are meant for reference only, and are NOT to be used as detailed hydraulic diagrams. The detailed hydraulic dimensioning and balancing are NOT shown, and are the responsibility of the installer.
- For more information about the configuration settings to optimize heat pump operation, see "8 Configuration" on page 50.

This chapter contains application guidelines for:

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

5.2 Setting up the space heating/ cooling system

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

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

- How many rooms are heated or cooled by the 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.

NOTICE

If an external room thermostat is used, the external room thermostat will control the room frost protection. However, the room frost protection is only possible if the leaving water temperature control on the unit's user interface is turned ON.

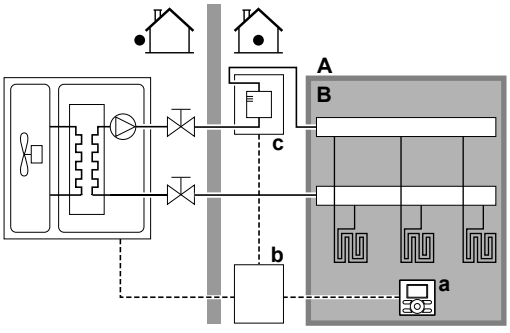
INFORMATION

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

5.2.1 Single room

Under floor heating or radiators – Wired room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface used as room thermostat
b Control box
c Backup heater (option)

- The under floor heating or radiators are directly connected to the outdoor unit – or to the backup heater, if there is one.
- The room temperature is controlled by the user interface, that is connected to control box EKCB07CAV3. Possible installations:
  - Control box EKCB07CAV3 is installed in the room and the user interface is used as room thermostat.
  - Control box EKCB07CAV3 is installed indoors, close to the outdoor unit + user interface installed in the room and used as room thermostat.

Configuration

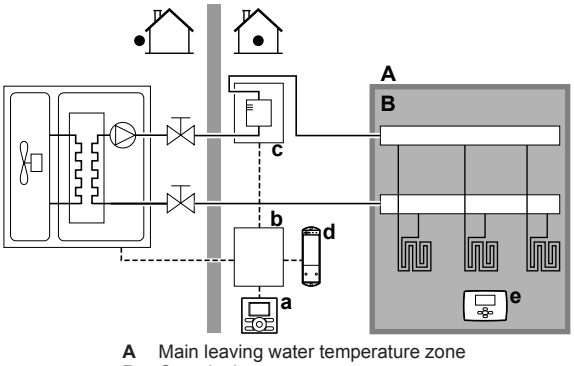
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

Benefits

- **Cost effective.** You do NOT need an additional external room thermostat.
- **Highest comfort and efficiency**. The smart room thermostat functionality can decrease or increase the desired leaving water temperature based on the actual room temperature (modulation). This results in:
  - Stable room temperature matching the desired temperature (higher comfort)
  - Less ON/OFF cycles (more quiet, higher comfort and higher efficiency)
  - Lowest possible leaving water temperature (higher efficiency)
- **Easy**. You can easily set the desired room temperature via the user interface:
  - For your daily needs, you can use preset values and schedules.
  - To deviate from your daily needs, you can temporarily overrule the preset values and schedules, use the holiday mode…

Under floor heating or radiators – Wireless room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface
b Control box
c Backup heater (option)
d Receiver for wireless external room thermostat
e Wireless external room thermostat

- The under floor heating or radiators are directly connected to the outdoor unit – or to the backup heater, if there is one.

- The room temperature is controlled by the wireless external room thermostat (optional equipment EKRTR1).

Configuration

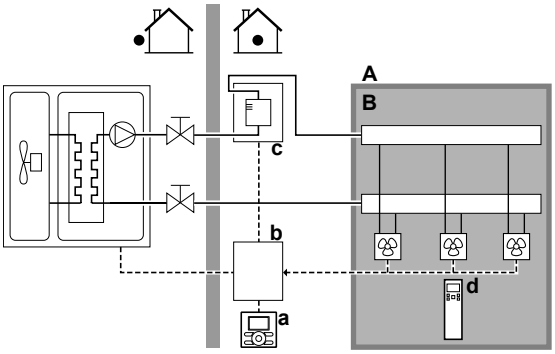
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.E.5] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **Wireless.** The Daikin external room thermostat is available in a wireless version.
- **Efficiency.** Although the external room thermostat only sends ON/OFF signals, it is specifically designed for the heat pump system.
- **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 User interface
b Control box
c Backup heater (option)
d Remote controller of the heat pump convectors

- The heat pump convectors are directly connected to the outdoor unit – or to the backup heater, if there is one.
- The desired room temperature is set via the remote controller of the heat pump convectors.
- The space heating/cooling demand signal is sent to one digital input on control box EKCB07CAV3 (X2M/1 and X2M/2)
- The space operation mode is sent to the heat pump convectors by one digital output on control box EKCB07CAV3 (X8M/6 and X8M/7).

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.E.5] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

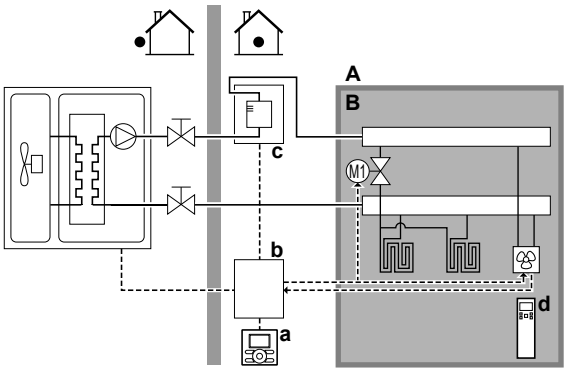
Benefits

- **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 User interface
b Control box
c Backup heater (option)
d Remote controller of the heat pump convectors

- The heat pump convectors are directly connected to the outdoor unit – or to the backup heater, if there is one.
- 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 control box EKCB07CAV3 (X2M/1 and X2M/2)

- The space operation mode is sent by one digital output (X8M/6 and X8M/7) on control box EKCB07CAV3 to:
  - The heat pump convectors
  - The shut-off valve

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.E.5] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **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

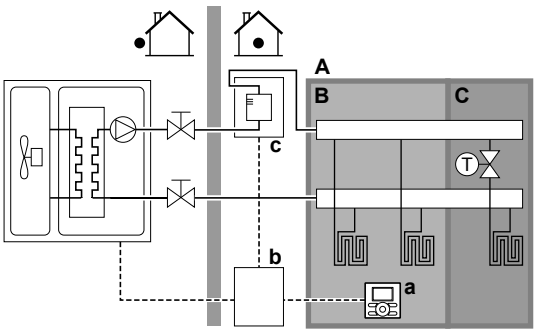
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

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 connected to control box EKCB07CAV3, or an external room thermostat), while the other rooms are controlled by so-called thermostatic valves (field supply), 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
b Control box
c Backup heater (option)

- The under floor heating of the main room is directly connected to the outdoor unit – or to the backup heater, if there is one.
- The room temperature of the main room is controlled by the user interface used as thermostat.
- A thermostatic valve is installed before the under floor heating in each of the other rooms.

INFORMATION

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

Configuration

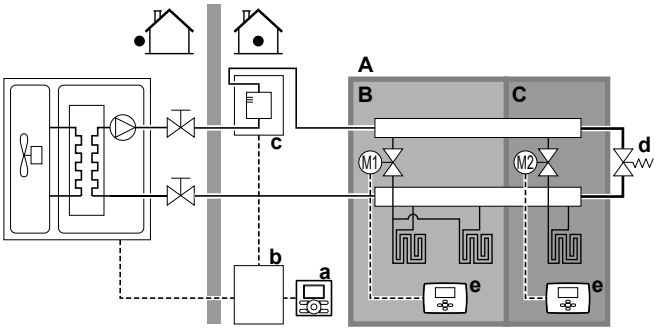
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

Benefits

- **Cost effective.** You do NOT need an additional external room thermostat.
- **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 User interface
b Control box
c Backup heater (option)
d Bypass valve
e External room thermostat

- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating or cooling demand.
- A bypass valve must be installed to make water recirculation possible when all shut-off valves are closed. To guarantee reliable operation, provide a minimum water flow as described in table "To check the water volume and flow rate" in "6.3 Preparing water piping" on page 26.
- The main user interface (connected to control box EKCB07CAV3) decides the space operation mode. Mind that the space operation mode of the additional user interfaces (used as room thermostat) must be set to match that of the main user interface.
- The room thermostats are connected to the shut-off valves, and do NOT have to be connected to the outdoor unit. The outdoor unit will supply leaving water all the time, with the possibility to program a leaving water schedule.

Configuration

Setting	Value
Unit temperature control: ▪ #: [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

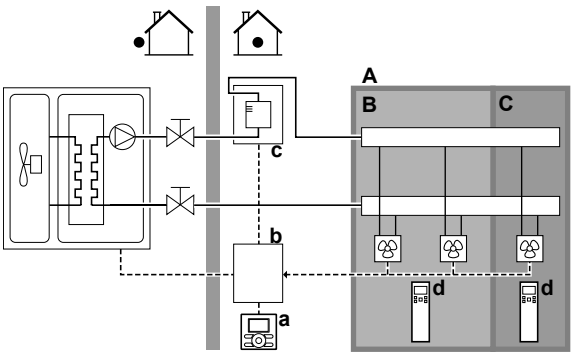
Benefits

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 – Multiple rooms

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a User interface
b Control box
c Backup heater (option)
d Remote controller of the heat pump convectors

- The desired room temperature is set via the remote controller of the heat pump convectors.
- The main user interface (connected to control box EKCB07CAV3) decides the space operation mode.
- The heating demand signals of each heat pump convector are connected in parallel to the digital input on control box EKCB07CAV3 (X2M/1 and X2M/2). The outdoor unit will only supply leaving water temperature when there is an actual demand.

INFORMATION

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

Configuration

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

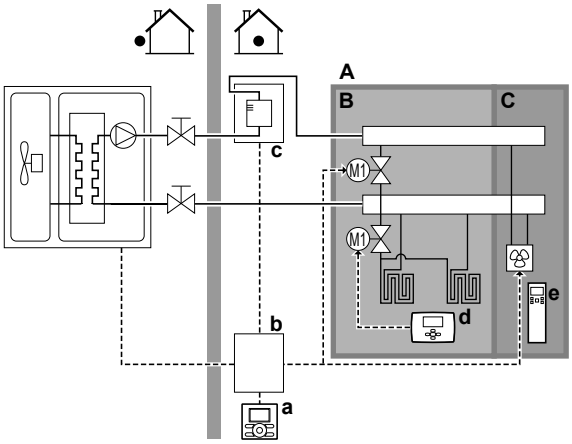
Benefits

Compared with heat pump convectors for one room:

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

Combination: Under floor heating + Heat pump convectors

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a User interface
b Control box
c Backup heater (option)
d External room thermostat
e Remote controller of the heat pump convectors

- For each room with heat pump convectors: The heat pump convectors are directly connected to the outdoor unit – or to the backup heater, if there is one.
- 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 main user interface (connected to control box EKCB07CAV3) decides the space operation mode. Mind that the operation mode of each external room thermostat and heat pump convector remote controller must be set to match that of the main user interface.

INFORMATION

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

Configuration

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

5.2.3 Multiple rooms – Two LWT zones

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

In this document:

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

NOTICE

If there are two leaving water temperature zones, and an external room thermostat is used, then cooling operation is NOT possible.

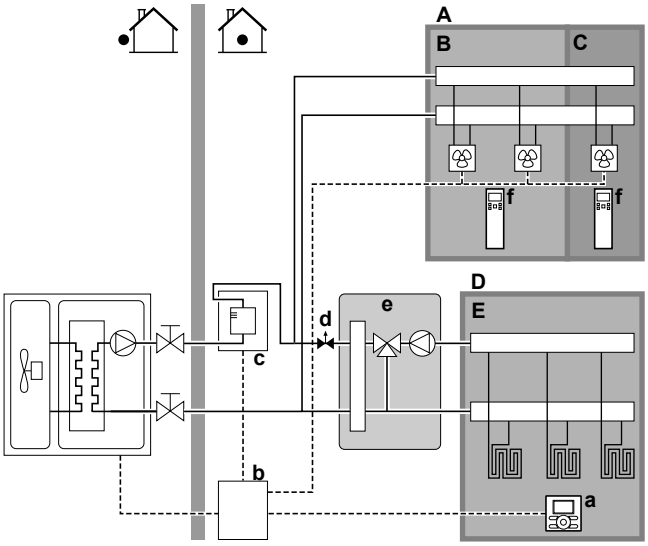
CAUTION

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: 35°C
Bed rooms (additional zone)	Heat pump convectors: 45°C

Setup



A Additional leaving water temperature zone
B Room 1
C Room 2
D Main leaving water temperature zone
E Room 3
a User interface
b Control box
c Backup heater (option)
d Pressure-regulating valve
e Mixing valve station
f Remote controller of the heat pump convectors

INFORMATION

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

- For the main zone:
  - A mixing valve station is installed before the under floor heating.
  - The room temperature is controlled by the user interface, which is used as room thermostat.

NOTICE

Daikin is NOT responsible for the operation of the mixing valve station pump. It is the responsibility of the installer to guarantee pump operation.

- For the additional zone:
  - The heat pump convectors are directly connected to the outdoor unit – or to the backup heater, if there is one.
  - The desired room temperature is set via the 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 control box EKCB07CAV3 (X2M/1 and X2M/2). The outdoor unit will only supply the desired additional leaving water temperature when there is an actual demand.
- The main user interface (connected to control box EKCB07CAV3) decides the space operation mode. Mind that the operation mode of each heat pump convector remote controller must be set to match that of the main user interface.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface. **Note:** ▪ Main room = user interface used as room thermostat functionality ▪ Other rooms = external room thermostat functionality
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	1 (2 LWT zones): Main + additional
In case of heat pump convectors: External room thermostat for the **additional** zone: ▪ #: [A.2.2.5] ▪ Code: [C-06]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition. No separation between heating or cooling demand.
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 outdoor 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 outdoor unit
  - An auxiliary boiler (field supply) connected to the system
- When the room thermostat requests heating, the outdoor unit or the auxiliary boiler starts operating depending on the outdoor temperature (status of the changeover to external heat source). When the permission is given to the auxiliary boiler, the space heating by the outdoor unit is turned OFF.
- Bivalent operation is only possible for space heating, NOT for domestic hot water production. Domestic hot water is always produced by the DHW tank connected to the outdoor unit.

INFORMATION

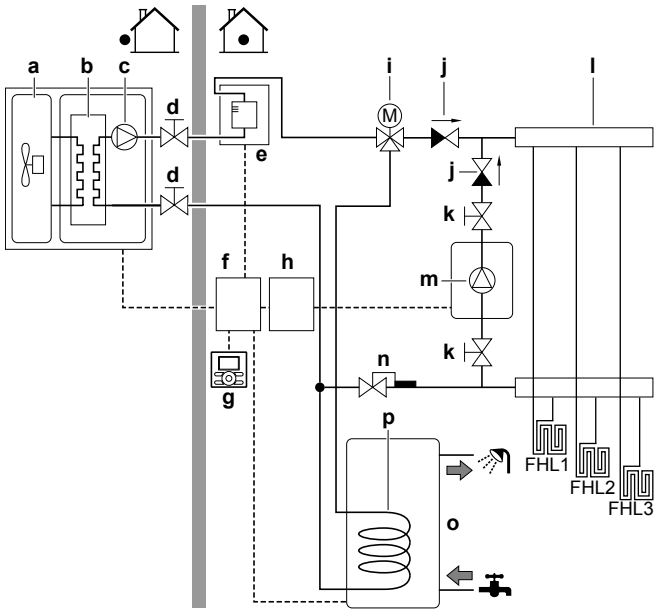
For bivalent operation to be possible, the system requires option box EK2CB07CAV3.

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 boiler as follows:



a Outdoor unit
b Heat exchanger
c Pump
d Shut-off valve
e Backup heater (option)
f Control box
g User interface
h Option box
i Motorised 3-way valve (delivered with the domestic hot water tank)
j Non-return valve (field supply)
k Shut-off valve (field supply)
l Collector (field supply)
m Auxiliary boiler (field supply)
n Aquastat valve (field supply)
o Domestic hot water tank (option)
p 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 pre-mounted in the outdoor unit.
- Install control box EKCB07CAV3 and option box EK2CB07CAV3.
- Connect X8M/3 and X8M/4 (changeover to external heat source) on option box EK2CB07CAV3 to the auxiliary boiler thermostat.
- To setup the heat emitters, see "5.2 Setting up the space heating/cooling system" on page 14.

Configuration

Via the user interface (quick wizard):

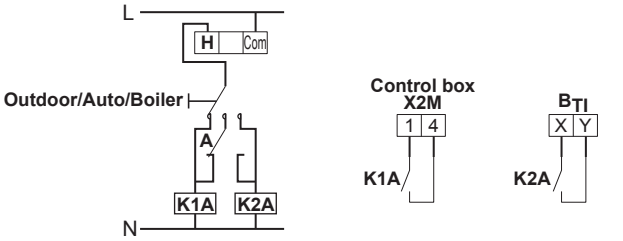
- Set the use of a bivalent system as external heat source.
- Set the bivalent temperature and hysteresis.

NOTICE

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

Changeover to external heat source decided by an auxiliary contact

- Only possible in external room thermostat control AND one leaving water temperature zone (see "5.2 Setting up the space heating/cooling system" on page 14).
- The auxiliary contact can be:
  - An outdoor temperature thermostat
  - An electricity tariff contact
  - A manually operated contact
  - …
- Setup: Connect the following field wiring:



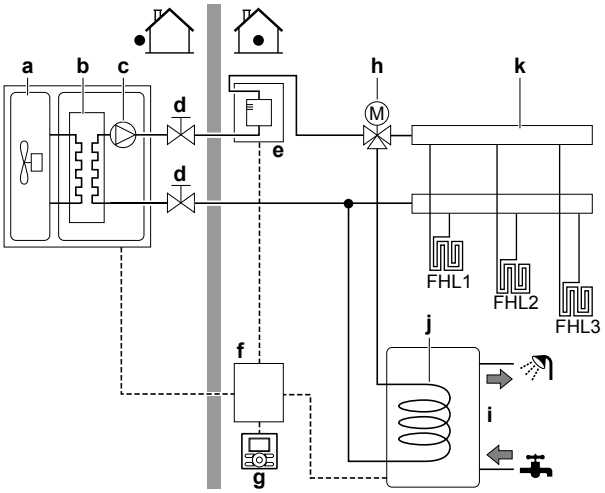
B_{TI}	Boiler thermostat input
A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of outdoor unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)
Outdoor	Outdoor unit
Auto	Automatic
Boiler	Boiler
Control box	Control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

NOTICE

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

5.4 Setting up the domestic hot water tank

5.4.1 System layout – Standalone DHW tank



a	Outdoor unit
b	Heat exchanger
c	Pump
d	Shut-off valve
e	Backup heater (option)
f	Control box
g	User interface
h	Motorised 3-way valve
i	Domestic hot water tank
j	Heat exchanger coil
k	Collector (field supply)
FHL1...3	Under floor heating

5.4.2 Selecting the volume and desired temperature for the DHW tank

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

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

1 Determining the DHW consumption (equivalent hot water volume at 40°C).

2 Determining the volume and desired temperature for the DHW tank.

Determining the DHW consumption

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

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

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

- 3 showers
- 1 bath
- 3 sink volumes

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

Determining the volume and desired temperature for the DHW tank

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

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

Possible DHW tank volumes

Type	Possible volumes
Standalone DHW tank	▪ 150 l ▪ 180 l ▪ 200 l ▪ 250 l ▪ 300 l ▪ 500 l

Energy saving tips

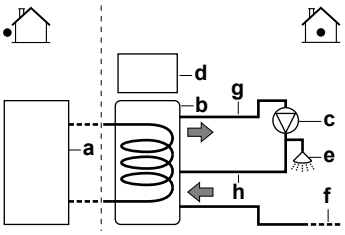
- If the DHW consumption differs from day to day, you can program a weekly schedule with different desired DHW tank temperatures for each day.
- The lower the desired DHW tank temperature, the more cost effective. By selecting a larger DHW tank, you can lower the desired DHW tank temperature.
- The heat pump itself can produce domestic hot water of maximum 55°C (50°C if outdoor temperature is low). The electrical resistance integrated in the heat pump can increase this temperature. However, this consumes more energy. Daikin recommends to set the desired DHW tank temperature below 55°C to avoid using the electrical resistance.
- The 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. In case 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.

5.4.3 Setup and configuration – DHW tank

- For large DHW consumptions, you can heat up the DHW tank several times during the day.
- To heat up the DHW tank to the desired DHW tank temperature, you can use the following energy sources:
  - Thermodynamic cycle of the heat pump
  - Electrical booster heater
- For more information about:
  - Optimizing the energy consumption for producing domestic hot water, see "8 Configuration" on page 50.
  - Connecting the electrical wiring of the domestic hot water tank to control box EKCB07CAV3, see the installation manual of the domestic hot water tank.
  - Connecting the water piping of the domestic hot water tank to the outdoor unit, see the installation manual of the domestic hot water tank.

5.4.4 DHW pump for instant hot water

Setup



a Outdoor unit
b Domestic hot water tank
c Domestic hot water pump
d Control box
e Shower
f Cold water
g Domestic hot water OUT
h Recirculation connection

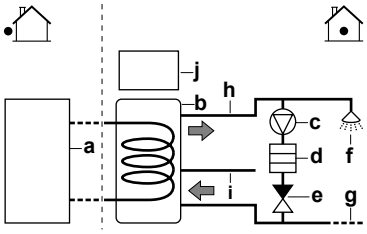
- By connecting a DHW pump, instant hot water can be available at the tap.
- The DHW pump and the installation are field supply and the responsibility of the installer.
- For more information about the recirculation connection, see "7.8.8 To connect the domestic hot water pump" on page 44, and the installation manual of the domestic hot water tank.

Configuration

- For more information, see "8 Configuration" on page 50.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

5.4.5 DHW pump for disinfection

Setup



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

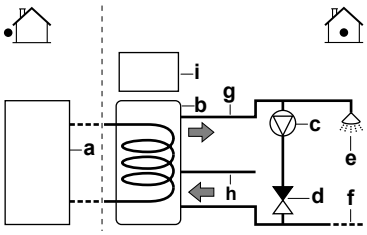
- The DHW pump is field-supplied and its installation is the responsibility of the installer.
- The temperature of the DHW tank can be set to a maximum of 75°C (if [E-07]=0) or 80°C (if [E-07]=5). If the applicable legislation requires a higher temperature for disinfection, you can connect a DHW pump 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.
- For more information about the recirculation connection, see "7.8.8 To connect the domestic hot water pump" on page 44, and the installation manual of the domestic hot water tank.

Configuration

The outdoor unit can control DHW pump operation. For more information, see "8 Configuration" on page 50.

5.4.6 DHW pump for tank preheating

Setup



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

- The DHW pump is field-supplied and its installation is the responsibility of the installer.

- For the standalone DHW tank: If there is no electrical backup heater in the space heating circuit, you must install a DHW pump for tank preheating.

Configuration

The outdoor unit can control DHW pump operation. For more information, see "8 Configuration" on page 50.

5.5 Setting up the energy metering

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

INFORMATION

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

5.5.1 Produced heat

INFORMATION

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

INFORMATION

If glycol is present in the system ([E-0D]=1]), then the produced heat will NOT be calculated, nor will it be displayed on the user interface.

- 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 17.1Ω, the capacity of the heater at 230 V is 3100 W.

5.5.2 Consumed energy

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

- Calculating
- Measuring

INFORMATION

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

Calculating the consumed energy

- The consumed energy is calculated internally based on:
  - The actual power input of the outdoor unit
  - The set capacity of the booster heater and the optional backup 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 optional backup heater (step 1 and step 2)
  - The booster heater

Measuring the consumed energy

- Preferred method because of higher accuracy.
- Setup and configuration:
  - Requires option box EK2CB07CAV3.
  - Requires external power meters.
  - When using electrical power meters, set the number of pulses/kWh for each power meter via the user interface.

INFORMATION

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

5.5.3 Normal kWh rate power supply

General rule

One power meter that covers the entire system is sufficient.

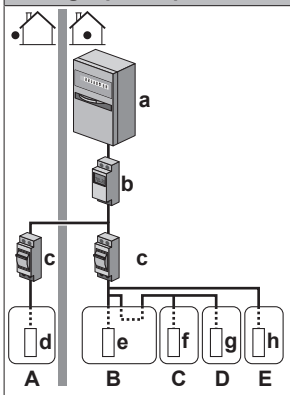
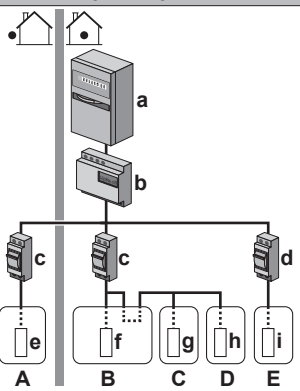
Setup

- Install control box EKCB07CAV3 and option box EK2CB07CAV3.
- Connect the power meter to X2M/7 and X2M/8 of option box EK2CB07CAV3.

Power meter type

In case of…	Use a… power meter
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 *9W backup heater model connected to a three-phase grid)	Three-phase

Example

Single-phase power meter	Three-phase power meter
	
A Outdoor unit	**A** Outdoor unit
B Control box	**B** Control box
C DHW tank	**C** DHW tank
D Option box	**D** Option box
E Backup heater kit	**E** Backup heater kit
a Electrical cabinet (L_1/N)	**a** Electrical cabinet (L_1/L_2/L_3/N)
b Power meter (L_1/N)	**b** Power meter (L_1/L_2/L_3/N)
c Fuse (L_1/N)	**c** Fuse (L_1/N)
d Outdoor unit (L_1/N)	**d** Fuse (L_1/L_2/L_3/N)
e Control box (L_1/N)	**e** Outdoor unit (L_1/N)
f Booster heater (L_1/N)	**f** Control box (L_1/N)
g Option box (L_1/N)	**g** Booster heater (L_1/N)
h Backup heater (L_1/N)	**h** Option box (L_1/N)
	i Backup heater (L_1/L_2/L_3/N)

Exception

- You can use a second power meter if:
  - The power range of one meter is insufficient.
  - The electrical meter cannot easily be installed in the electrical cabinet.
  - 230 V and 400 V three-phase grids are combined (very uncommon), because of technical limitations of power meters.
- Connection and setup:
  - Connect the second power meter to X2M/9 and X2M/10 of option box EK2CB07CAV3.
  - In the software the power consumption data of both meters is added so you do NOT have to set which meter covers which power consumption. You only need to set the number of pulses of each power meter.
- See "5.5.4 Preferential kWh rate power supply" on page 23 for an example with two power meters.

5.5.4 Preferential kWh rate power supply

General rule

- Power meter 1: Measures the refrigerant part of the outdoor unit.
- Power meter 2: Measures the rest (i.e. the hydro part of the outdoor unit, control box EKCB07CAV3, option box EK2CB07CAV3, the backup heater kit, and the optional booster heater).

Setup

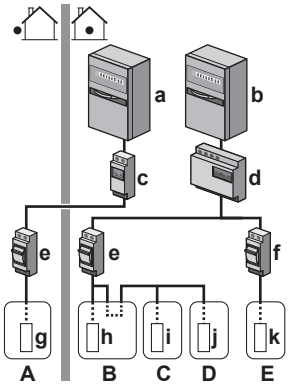
- Connect power meter 1 to X2M/7 and X2M/8 of option box EK2CB07CAV3.
- Connect power meter 2 to X2M/9 and X2M/10 of option box EK2CB07CAV3.

Power meter types

- Power meter 1: Single-phase power meter.
- 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

Three-phase backup heater:



A Outdoor unit
B Control box
C Domestic hot water tank
D Option box
E Backup heater kit
a Electrical cabinet (L_1/N): Preferential kWh rate power supply
b Electrical cabinet (L_1/L_2/L_3/N): Normal kWh rate power supply
c Power meter (L_1/N)
d Power meter (L_1/L_2/L_3/N)
e Fuse (L_1/N)
f Fuse (L_1/L_2/L_3/N)
g Outdoor unit (L_1/N)
h Control box (L_1/N)
i Booster heater (L_1/N)
j Option box (L_1/N)
k Backup heater (L_1/L_2/L_3/N)

5.6 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:
  - Requires control box EKCB07CAV3 and option box EK2CB07CAV3.
  - For installation instructions, see the installation manual of the remote indoor sensor and the addendum book for optional equipment.

Configuration: Select room sensor [A.2.2.F.5].

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.

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 and the addendum book for optional equipment.
- Configuration: Select outdoor sensor [A.2.2.B].
- 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.

6 Preparation

6.1 Overview: Preparation

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

It contains information about:

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

6.2 Preparing the 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 an installation location with sufficient space for carrying the unit in and out of the site.

6.2.1 Installation site requirements of the outdoor unit

INFORMATION

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

Mind the following spacing guidelines (see "Service space: Outdoor unit" in the chapter "Technical data").

INFORMATION

If shut-off valves are installed on the unit, provide a minimum space of 400 mm at the air inlet side. If shut-off valves are NOT installed on the unit, provide a minimum space of 250 mm.

If the system contains a domestic hot water tank, meet the following requirements:

Maximum allowable distance between outdoor unit and …	Distance
domestic hot water tank	10 m
3-way valve	10 m

NOTICE

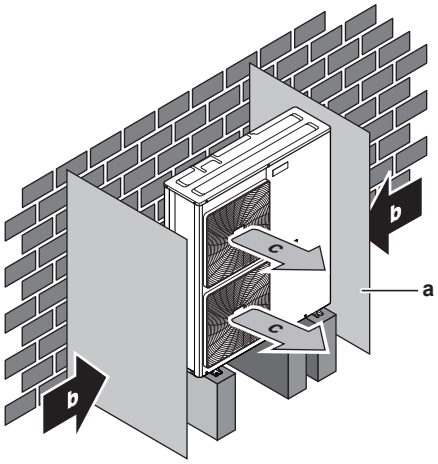
- Do NOT stack the units on each other.
- Do NOT hang the unit on a ceiling.

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

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

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

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



a Baffle plate
b Prevailing wind direction
c Air outlet

Do NOT install the unit in the following places:

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

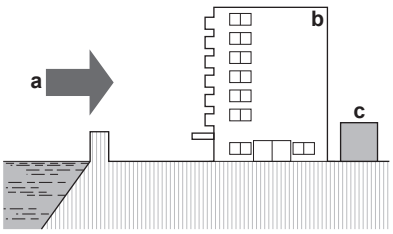
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

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

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

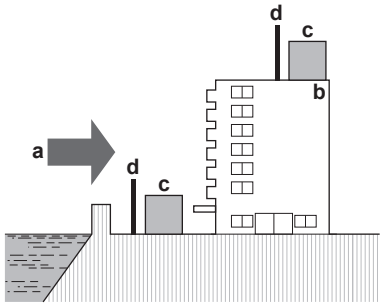
Install the outdoor unit away from direct sea winds.

Example: Behind the building.



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

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

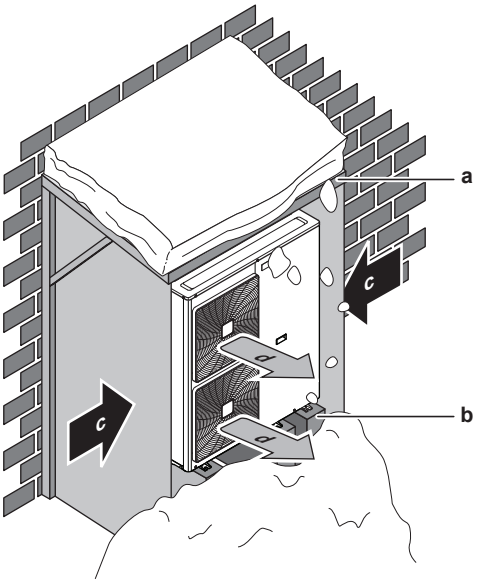


a Sea wind
b Building
c Outdoor unit
d Windbreaker

The outdoor unit is designed for outdoor installation only, and for ambient temperatures ranging 10~43°C in cooling mode, –25~25°C in space heating mode, and –25~35°C in domestic hot water operation mode.

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

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



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

In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow. See "7.3 Mounting the outdoor unit" on page 33 for more details.

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

6.2.3 Installation site requirements of the control box

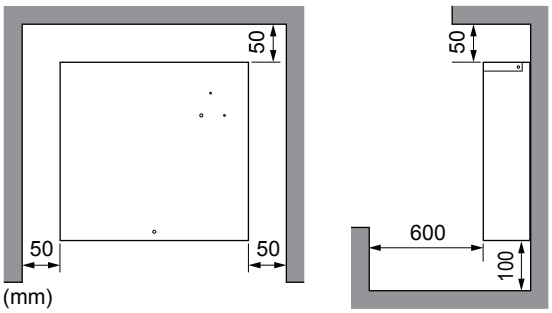
INFORMATION

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

- Mind the measurement guidelines:

Maximum distance between control box and outdoor unit	20 m
Maximum distance between control box and backup heater kit	10 m
Maximum distance between control box and domestic hot water tank	10 m

- Mind the following spacing installation guidelines:



- The control box is designed to be wall-mounted in indoor locations only. Make sure the installation surface is a flat and vertical non-combustible wall.
- The control box is designed to operate in ambient temperatures ranging from 5~35°C.

Do NOT install the control box in the following places:

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

6.2.4 Installation site requirements of the option box

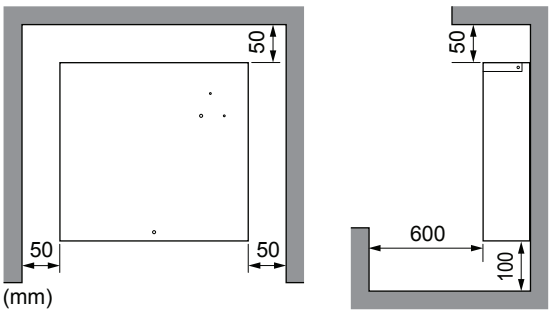
INFORMATION

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

- Mind the measurement guidelines:

Maximum distance between the option box and control box EKCB07CAV3	3 m

- Mind the following spacing installation guidelines:



- The option box is designed to be wall-mounted in indoor locations only. Make sure the installation surface is a flat and vertical non-combustible wall.
- The option box is designed to operate in ambient temperatures ranging from 5~35°C.

Do NOT install the option box in the following places:

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

6.2.5 Installation site requirements of the backup heater

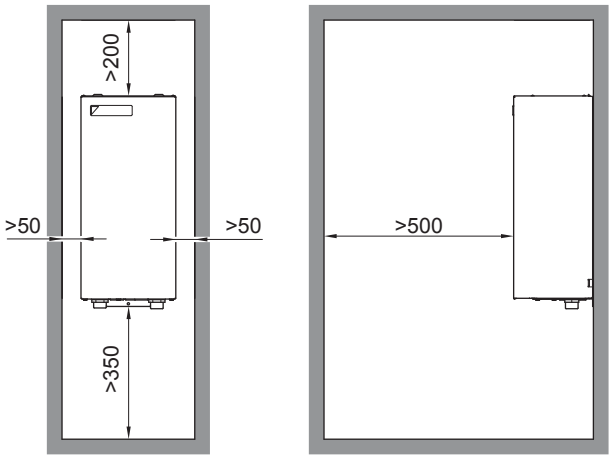
INFORMATION

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

- Mind the measurement guidelines:

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

- Mind the following spacing installation guidelines:



INFORMATION

If the backup heater is installed in a reversible system (heating+cooling) and valve kit EKMBHBP1 is part of the system, it may be required to provide more space under the backup heater than indicated above. For more information, refer to "7.7.5 About the valve kit" on page 37.

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

Do NOT install the backup heater in the following places:

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

6.3 Preparing water piping

6.3.1 Water circuit requirements

INFORMATION

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

NOTICE

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

- **Connecting piping – Legislation.** Make all piping connections in accordance with the applicable legislation and the instructions in the "Installation" chapter, respecting the water inlet and outlet.
- **Connecting piping – Force.** Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
- **Connecting piping – Tools.** Only use appropriate tooling to handle brass, which is a soft material. If NOT, pipes will get damaged.
- **Connecting piping – Air, moisture, dust.** If air, moisture or dust gets into the circuit, problems may occur. To prevent this:
  - Only use clean pipes
  - Hold the pipe end downwards when removing burrs.
  - Cover the pipe end when inserting it through a wall, to prevent dust and/or particles entering the pipe.
  - Use a decent thread sealant to seal connections.

NOTICE

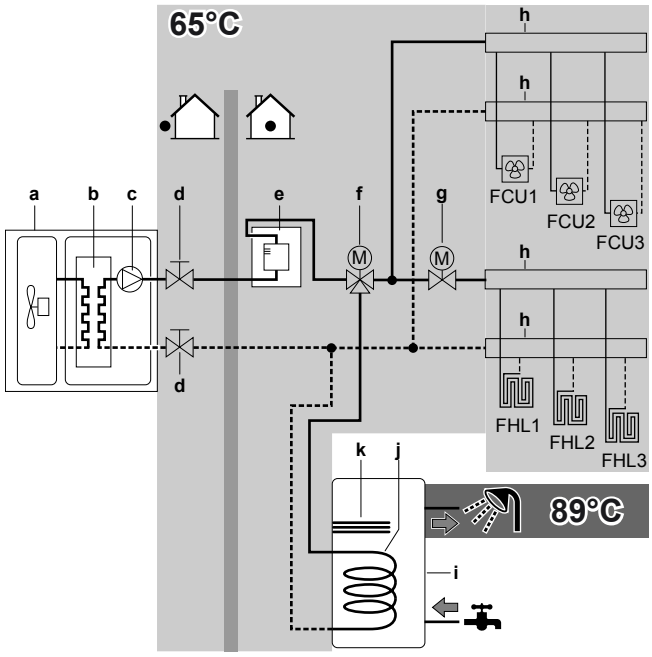
If glycol is present in the system, make sure the thread sealant used is resistant to glycol.

- **Closed circuit.** Use the outdoor unit ONLY in a closed water system. Using the system in an open water system will lead to excessive corrosion.
- **Piping length.** It is recommended to avoid long runs of piping between the domestic hot water tank and the hot water end point (shower, bath,…) and to avoid dead ends.
- **Piping diameter.** Select the water piping diameter in relation to the required water flow and the available external static pressure of the pump. See "14 Technical data" on page 90 for the external static pressure curves of the outdoor unit.
- **Water flow.** If a backup heater or tank with recirculation pump is installed, or if glycol is present in the system ([E-0D] set to "1"), it is required to guarantee a minimum flow of 15 l/min. In all other cases the minimum flow is 20 l/min. When the flow is lower than the above mentioned minimum flow, the system will stop operation and display error 7H.
- **Field supply components – Water and glycol.** Only use materials that are compatible with the water (and, if applicable, glycol) used in the system, and with the materials used in the outdoor unit.
- **Field supply components – Water pressure and temperature.** Check that all components in the field piping can withstand the water pressure and water temperature.

- **Water pressure.** The maximum water pressure is 3 bar. Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- **Water temperature.** All installed piping and piping accessories (valve, connections,…) MUST withstand the following temperatures:

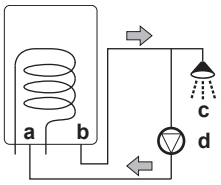
INFORMATION

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



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

- **Drainage – Low points.** Provide drain taps at all low points of the system in order to allow complete drainage of the water circuit.
- **Drainage – Pressure relief valve.** Provide a proper drain for the pressure relief valve to avoid water coming into contact with electrical parts.
- **Air vents.** Provide air vents at all high points of the system, which must also be easily accessible for servicing. The outdoor unit has a manual air purge valve. The backup heater (option) has an automatic air purge valve. Check that automatic air purge valves are NOT tightened too much, so that the automatic release of air from the water circuit is possible.
- **Zn-coated parts.** Never use Zn-coated parts in the water circuit. Because the unit's internal water circuit uses copper piping, excessive corrosion may occur.
- **Non-brass metallic piping.** When using non-brass metallic piping, insulate the brass and non-brass properly so that they do NOT make contact with each other. This to prevent galvanic corrosion.
- **Valve – Separating circuits.** When using a 3-way valve in the water circuit make sure that the domestic hot water circuit and the floor heating circuit is fully separated.
- **Valve – Change-over time.** When using a 2-way valve or a 3-way valve in the water circuit, the maximum change-over time of the valve must be 60 seconds.
- **Filter.** It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from foul heating piping, it is recommended to use a magnetic or cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.
- **Domestic hot water tank – Capacity.** To avoid stagnation of water, it is important that the storage capacity of the domestic hot water tank meets the daily consumption of domestic hot water.
- **Domestic hot water tank – After installation.** Immediately after installation, the domestic hot water tank must be flushed with fresh water. This procedure must be repeated at least once a day the first 5 consecutive days after installation.
- **Domestic hot water tank – Standstills.** In cases where during longer periods of time there is no consumption of hot water, the equipment MUST be flushed with fresh water before usage.
- **Domestic hot water tank – Disinfection.** For the disinfection function of the domestic hot water tank, see "8.3.2 Domestic hot water control: advanced" on page 65.
- **Thermostatic mixing valves.** In accordance with the applicable legislation, it may be necessary to install thermostatic mixing valves.
- **Hygienic measures.** The installation must be in compliance with the applicable legislation and may require additional hygienic installation measures.
- **Recirculation pump.** In accordance with the applicable legislation, it may be required to connect a recirculation pump in between the hot water end point and the recirculation connection of the domestic hot water tank.



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

6.3.2 Formula to calculate the expansion vessel pre-pressure

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

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

6.3.3 To check the water volume and flow rate

The outdoor unit has an expansion vessel of 7 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

If	Then
The system contains a backup heater or a DHW tank with recirculation pump	The minimum water volume is 20 l[(a)]
The system does NOT contain a backup heater or a DHW tank with recirculation pump	The minimum water volume is 80 l[(a)(b)]

(a) The internal water volume of the outdoor unit NOT included.
(b) If an EKHWP tank is installed, no recirculation pump is required.

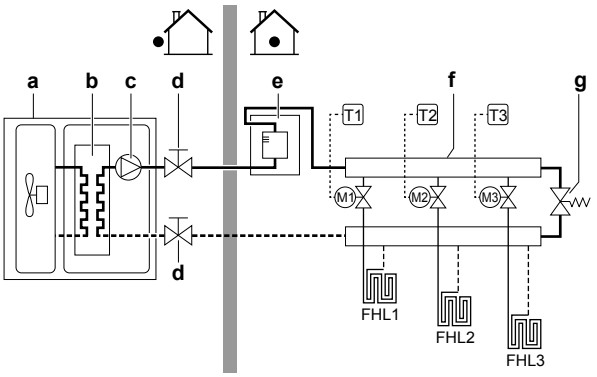
INFORMATION

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

NOTICE

When circulation in each space heating/cooling 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.

The following illustration shows a setup with remotely controlled valves:



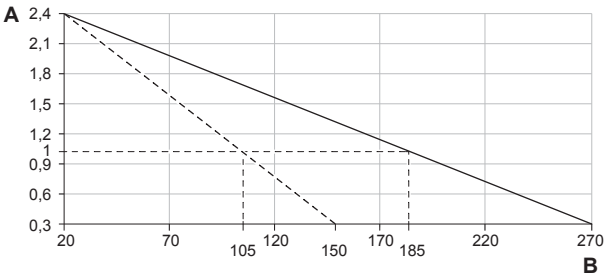
a Outdoor unit
b Heat exchanger
c Pump
d Shut-off valve
e Backup heater kit (optional)
f Collector (field supply)
g By-pass valve (field supply)
FHL1...3 Floor heating loop (field supply)
T1...3 Individual room thermostat (optional)
M1...3 Individual motorised valve to control loop FHL1...3 (field supply)

Maximum water volume

NOTICE

The maximum water volume depends on whether glycol is added to the water circuit. For more information on the addition of glycol, refer to "7.7.6 To protect the water circuit against freezing" on page 38.

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



A Pre-pressure (bar)
B Maximum water volume (l)
Water
Water + glycol

Example: Maximum water volume and expansion vessel pre-pressure

Installation height difference[a]	Water volume	
	≤185/105 l[b]	>185/105 l[b]
≤7 m	No pre-pressure adjustment is required.	Do the following: ▪ Decrease the pre-pressure according to the required installation height difference. The pre-pressure should decrease by 0.1 bar for each metre below 7 m. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.
>7 m	Do the following: ▪ Increase the pre-pressure according to the required installation height difference. The pre-pressure should increase by 0.1 bar for each metre above 7 m. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.	The expansion vessel of the outdoor unit is too small for the installation. In this case, it is recommended to install an extra vessel outside the unit.

(a) This is the height difference (m) between the highest point of the water circuit and the outdoor unit. If the outdoor unit is at the highest point of the installation, the installation height is 0 m.
(b) The maximum water volume is 185 l in case the circuit is only filled with water, and 105 l in case the circuit is filled with water and glycol.

Minimum flow rate

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

NOTICE

If glycol was added to the water circuit, and the temperature of the water circuit is low, the flow rate will NOT be displayed on the user interface. In this case, the minimum flow rate can be checked by way of the pump test (check that the user interface does NOT display error 7H).

NOTICE

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

Minimum required flow rate	
The system contains a backup heater / DHW tank with recirculation pump / glycol	15 l/min
The system does NOT contain a backup heater / DHW tank with recirculation pump[a] / glycol	20 l/min

(a) If an EKHWP tank is installed, no recirculation pump is required.

See the recommended procedure as described in "9.4 Checklist during commissioning" on page 77.

6.3.4 Changing the pre-pressure of the expansion vessel

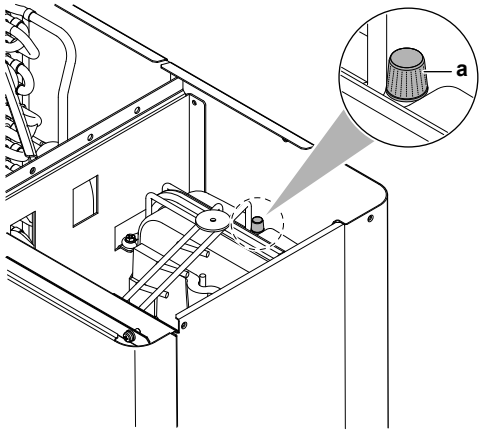
NOTICE

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 Schrader valve of the expansion vessel.



a Schrader valve

6.3.5 To check the water volume: Examples

Example 1

The outdoor 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 outdoor unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 350 l. The concentration of propylene glycol is 35%.

Actions:

- Because the total water volume (350 l) is more than the default water volume (105 l), the pre-pressure must be decreased.
- The required pre-pressure is:
  Pg = (0.3+(H/10)) bar = (0.3+(0/10)) bar=0.3 bar.
- The corresponding maximum water volume at 0.3 bar is 150 l. (See the graph in the chapter above).
- Because 350 l is more than 150 l, the expansion vessel is NOT appropriate for the installation. Therefore the system requires an external expansion vessel.

6.4 Preparing electrical wiring

6.4.1 About preparing electrical wiring

INFORMATION

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

WARNING

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

WARNING

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

WARNING

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

WARNING

ALWAYS use multicore cable for power supply cables.

6.4.2 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.

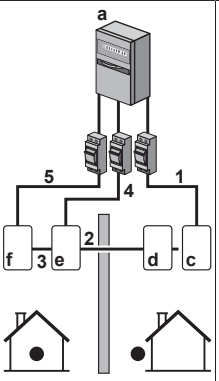
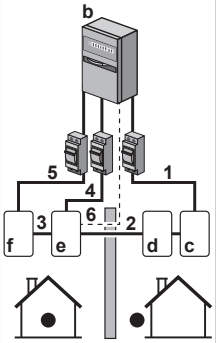
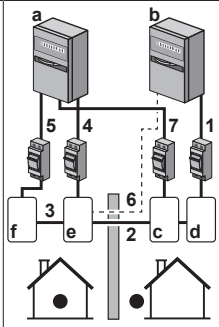
When the equipment is connected to such preferential kWh rate power supply, the electricity company is allowed to:

- 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.

Control box EKCB07CAV3 is designed to receive an input signal by which it switches the outdoor unit into forced-off mode. At that moment, the compressor will not operate.

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

6.4.3 Overview of electrical connections except external actuators

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

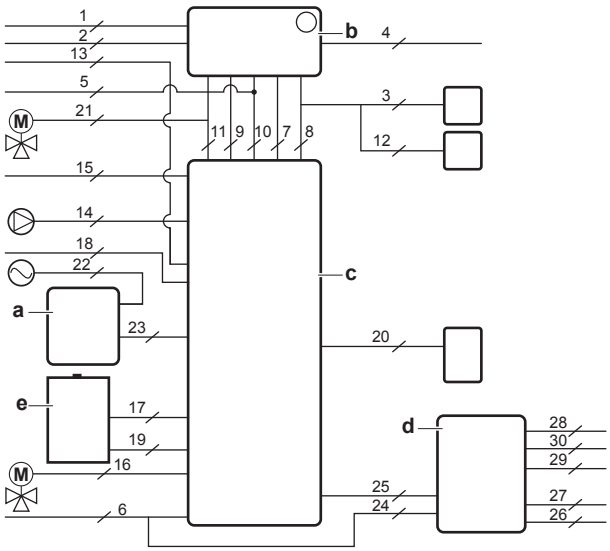
a Normal power supply
b Preferential kWh rate power supply
c Hydro part of the outdoor unit
d Refrigerant part of the outdoor unit
e Control box
f Backup heater kit
1 Power supply for outdoor unit
2 Interconnection cable to control box
3 Interconnection cable to backup heater kit
4 Power supply for control box
5 Power supply for backup heater kit
6 Preferential kWh rate power supply (voltage free contact)
7 Normal kWh rate power supply (to power the hydro part of the outdoor unit in the event of a 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 might NOT match your system layout.



a Backup heater kit
b Outdoor unit
c Control box
d Option box
e Domestic hot water tank

Outdoor unit

Item	Description	Wires	Maximum running current
Power supply			
1	Power supply for outdoor unit	2+GND or 3+GND	(a)
2	Normal kWh rate power supply	2	6.3 A
User interface			
3	User interface	2	(b)
Optional equipment			
4	Remote outdoor sensor	2	(c)
Field-supplied components			
5	Space heating/cooling operation control (or shut-off valve)	2	(c)

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

Control box

Item	Description	Wires	Maximum running current
Power supply			
6	Power supply for control box	2+GND	(a)
Interconnection cable			
7	Interconnection cable between outdoor unit and control box	2	(b)
8	Interconnection cable for the user interface (between outdoor unit and control box)	2	(c)

Item	Description	Wires	Maximum running current
9	Interconnection cable for the domestic hot water pump (between outdoor unit and control box)	2	(d)
10	Interconnection cable for the space heating/cooling operation control (or shut-off valve) (between outdoor unit and control box)	2	(j)
11	Interconnection cable for valve kit EKMBHBP1 (between outdoor unit and control box)	3 (of which 2 are shared with those of item 10)	(h)
User interface			
12	User interface	2	(c)
Optional equipment			
13	Preferential kWh rate power supply (voltage-free contact)	2	(e)
14	Domestic hot water pump	2	(d)
15	Space heating/cooling operation control (or shut-off valve)	2	(k)
16	3-way valve	3	(f)
17	Power supply for booster heater and thermal protection (from control box)	4+GND	(a)
18	Power supply for booster heater (to control box)	2+GND	13 A
19	Domestic hot water tank thermistor	2	(f)
20	Room thermostat/heat pump convector	3 or 4	100 mA(g)
21	Valve kit EKMBHBP1	3	(i)

(a) Cable section 2.5 mm².
(b) Cable section 0.75 mm² till 1.25 mm²; maximum length: 20 m.
(c) Cable section 0.75 mm² till 1.25 mm²; maximum length: 500 m. Applicable for both single user interface and dual user interface connection.
(d) Minimum cable section 0.75 mm².
(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) The thermistor and connection wire (12 m) are delivered with the domestic hot water tank.
(g) If valve kit EKMBHBP1 is part of the system, then the required cable section is 0.75 mm². If valve kit EKMBHBP1 is NOT part of the system, then the minimum required cable section is 0.75 mm², and the maximum cable length is 10 m.
(h) Cable section 0.75 mm².
(i) The valve and connection wire (12 m) are delivered with the valve kit.
(j) If valve kit EKMBHBP1 is part of the system, then the required cable section is 0.75 mm². If valve kit EKMBHBP1 is NOT part of the system, then the required cable section is 1.5 mm².
(k) If valve kit EKMBHBP1 is part of the system, then the required cable section is 0.75 mm². If valve kit EKMBHBP1 is NOT part of the system, then the minimum required cable section is 0.75 mm².

Backup heater kit

Item	Description	Wires	Maximum running current
Power supply			
22	Backup heater power supply	See table below.	—
Interconnection cable			
23	Interconnection cable between backup heater kit and control box	6 (3V3) 7 (6V3, 6W1, 9W1)	(a)

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

Backup heater	Power supply	Required number of conductors
EKMBUHCA3V3	1× 230 V	2+GND
EKMBUHCA9W1	1× 230 V	2+GND+2 bridges
	3× 400 V	4+GND

Option box

Item	Description	Wires	Maximum running current
Power supply			
24	Power supply for option box	2+GND	(a)
Interconnection cable			
25	Interconnection cable between option box and control box	3 (max 3 m)	(b)
Optional equipment			
26	Remote indoor sensor	2	(b)
Field-supplied components			
27	Electric meter	2 (per meter)	(b)
28	Alarm output	2	(b)
29	Space cooling/heating ON/OFF output	2	(b)
30	Changeover to external heat source	2	(b)

(a) Cable section 2.5 mm².
(b) Minimum cable section 0.75 mm².

NOTICE

- More technical specifications of the different connections are indicated on the inside of the units (outdoor unit, control box, option box and backup heater).
- For how to connect the electrical wiring to the outdoor unit (and if part of the system, the control box, option box, and backup heater), refer to "7.8 Connecting the electrical wiring" on page 40.

7 Installation

7.1 Overview: Installation

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

Typical workflow

Installation typically consists of the following stages:

1 Mounting the outdoor unit
2 Mounting the control box (if applicable)
3 Mounting the option box (if applicable)
4 Mounting the backup heater (if applicable)
5 Connecting the water piping
6 Connecting the electrical wiring
7 Finishing the installation of the outdoor unit
8 Finishing the installation of the control box (if applicable)
9 Finishing the installation of the option box (if applicable)
10 Finishing the installation of the backup heater (if applicable)

7.2 Opening the units

7.2.1 About opening the units

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

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

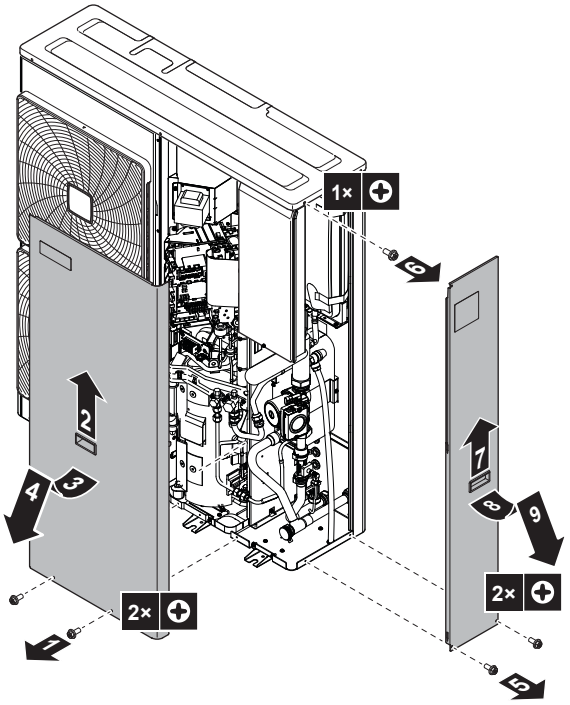
DANGER: RISK OF ELECTROCUTION

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

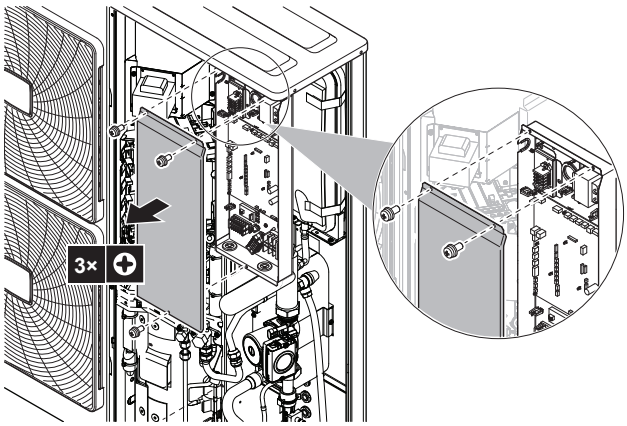
7.2.2 To open the outdoor unit

DANGER: RISK OF ELECTROCUTION

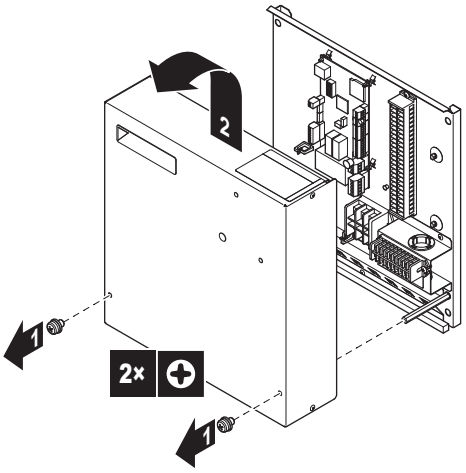
DANGER: RISK OF BURNING



7.2.3 To open the switch box cover of the outdoor unit



7.2.4 To open the control box



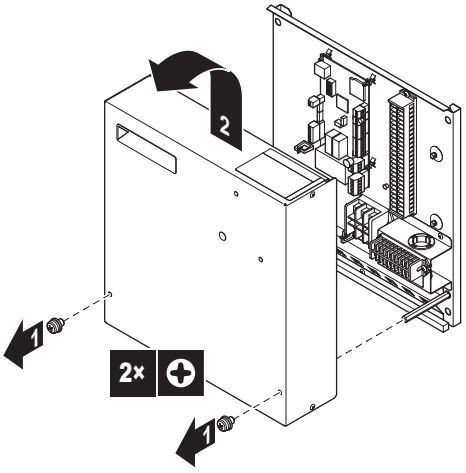
WARNING

The screws are delivered with toothed lock washers. ALWAYS use toothed lock washers, also when the screws need to be replaced. Failure to follow this warning may result in electric shock.

INFORMATION

The holes in the front plate are for the connection of the user interface to the control box. If you do NOT connect the user interface to the control box, do NOT remove the plugs from the holes.

7.2.5 To open the option box



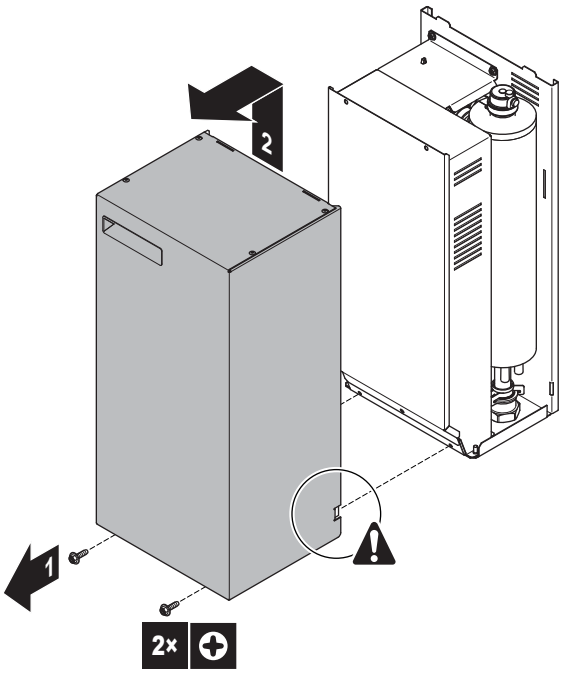
WARNING

The screws are delivered with toothed lock washers. ALWAYS use toothed lock washers, also when the screws need to be replaced. Failure to follow this warning may result in electric shock.

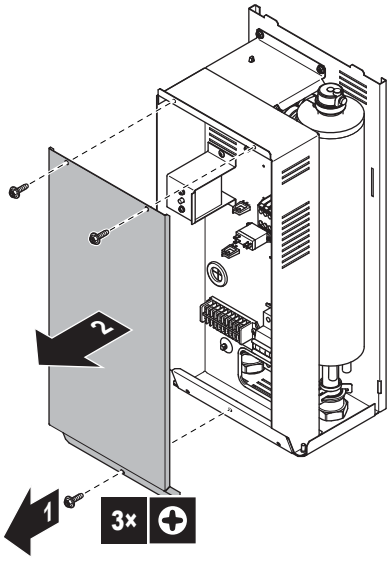
INFORMATION

Do NOT remove the plugs from the front plate of the option box.

7.2.6 To open the backup heater



7.2.7 To open the switch box cover of the backup heater



7.3 Mounting the outdoor unit

7.3.1 About mounting the outdoor unit

When

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

Typical workflow

Mounting the outdoor unit typically consists of the following stages:

1 Providing the installation structure.
2 Installing the outdoor unit.
3 Providing drainage.
4 Protecting the unit against snow and wind by installing a snow cover and baffle plates. See "Preparing installation site" in "6 Preparation" on page 24.

7.3.2 Precautions when mounting the outdoor unit

INFORMATION

Also read the precautions and requirements in the following chapters:

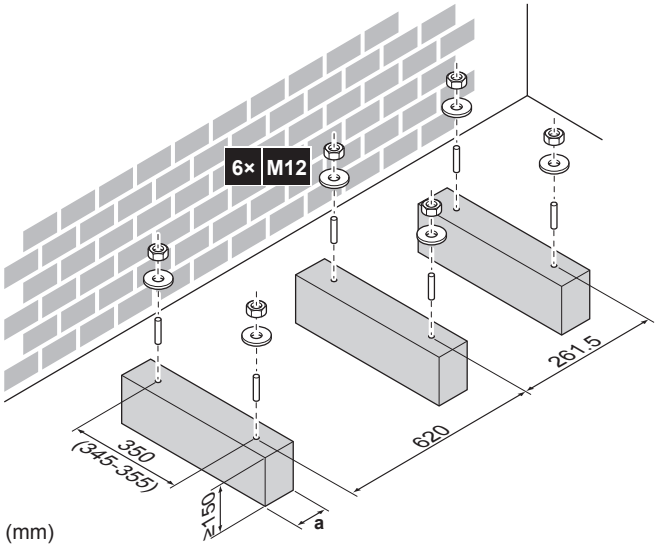
- General safety precautions
- Preparation

7.3.3 To provide the installation structure

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

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

Prepare 6 sets of anchor bolts, nuts and washers (field supply) as follows:

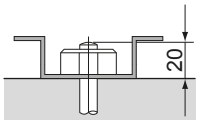


(mm)

a Make sure not to cover the drain holes.

INFORMATION

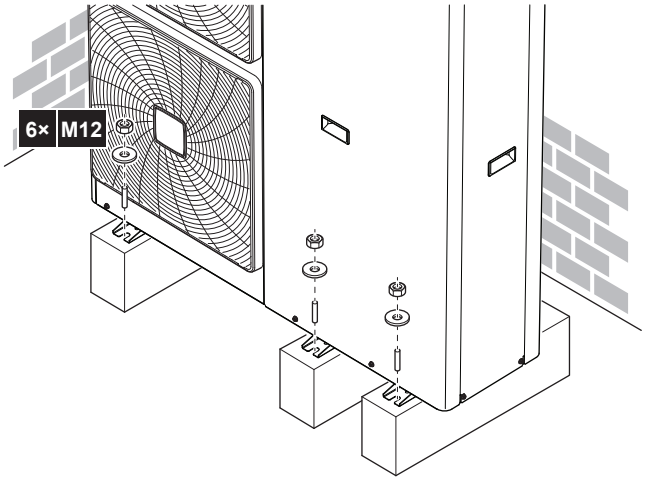
The recommended height of the upper protruding part of the bolts is 20 mm.



NOTICE

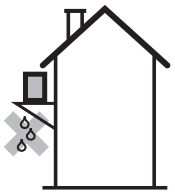
Fix the outdoor unit to the foundation bolts using nuts with resin washers (a). If the coating on the fastening area is stripped off, the nuts rust easily.

7.3.4 To install the outdoor unit



7.3.5 To provide drainage

- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is proper drainage in order to avoid ice accumulation.
- Prepare a water drainage channel around the foundation to drain waste water away from the unit.
- Avoid drain water flowing over the footpath, so that it does NOT become slippery in case of ambient freezing temperatures.
- If you install the unit on a frame, install a waterproof plate within 150 mm of the bottom side of the unit in order to prevent water from getting into the unit and to avoid drain water dripping (see the following figure).



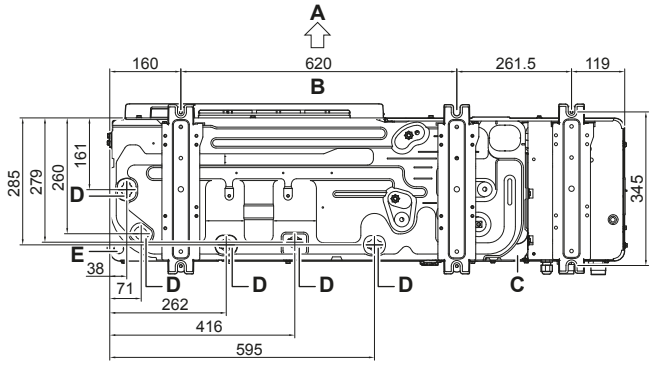
NOTICE

If the unit is installed in a cold climate, take adequate measures so that the evacuated condensate CANNOT freeze.

INFORMATION

If necessary, you can use a drain plug kit (field supply) to prevent drain water from dripping.

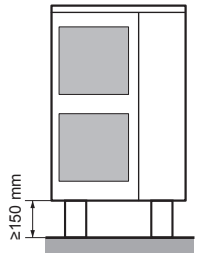
Drain holes (dimensions in mm)



A Discharge side
B Distance between anchor points
C Bottom frame
D Drain holes
E Knockout hole for snow

NOTICE

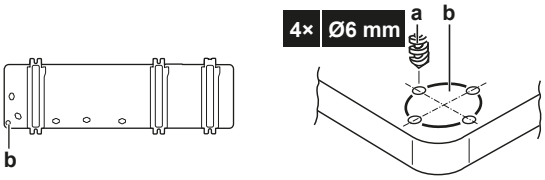
If drain holes of the outdoor unit are covered by a mounting base or by floor surface, raise the unit to provide a free space of more than 150 mm under the outdoor unit.



Snow

In regions with snowfall, snow might build up and freeze between the heat exchanger and the external plate. This might decrease the operating efficiency. To prevent this:

1 Drill (a, 4×) and remove the knockout hole (b).

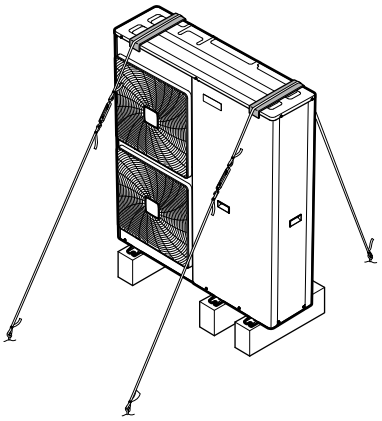


2 Remove the burrs, and paint the edges and areas around the edges using repair paint to prevent rusting.

7.3.6 To prevent the outdoor unit from falling over

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

1 Prepare 2 cables as indicated in the following illustration (field supply).
2 Place the 2 cables over the outdoor unit.
3 Insert a rubber sheet between the cables and the outdoor unit to prevent the cables from scratching the paint (field supply).
4 Attach the ends of the cables and tighten them.



7.4 Mounting the control box

7.4.1 Precautions when mounting the control box

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

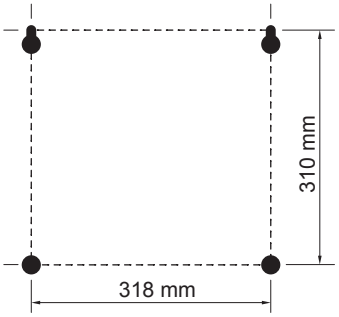
7.4.2 To install the control box

1 Remove the front plate.

2 Hold the back plate against the wall and mark the fixation points (2 on the top and 2 at the bottom).

NOTICE

Make sure that the marks (2 by 2) are completely level and that their dimensions correspond to the figure below.



3 Drill 4 holes and install 4 plugs (suitable for M5).

4 Put the screws in the top plugs and hang the box on the screws.

5 Put the screws in the bottom plugs.

6 Fix the 4 screws firmly.

INFORMATION

It is possible to connect the user interface to the control box. For more information, refer to "7.8.6 To connect the user interface" on page 42.

7.5 Mounting the option box

7.5.1 Precautions when mounting the option box

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

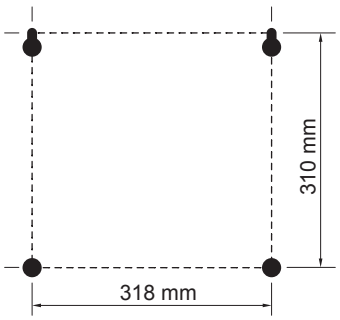
7.5.2 To install the option box

1 Remove the front plate.

2 Hold the back plate against the wall and mark the fixation points (2 on the top and 2 at the bottom).

NOTICE

Make sure that the marks (2 by 2) are completely level and that their dimensions correspond to the figure below.



3 Drill 4 holes and install 4 plugs (suitable for M5).

4 Put the screws in the top plugs and hang the box on the screws.

5 Put the screws in the bottom plugs.

6 Fix the 4 screws firmly.

7.6 Mounting the backup heater

7.6.1 About mounting the backup heater

NOTICE

- The backup heater can only be installed and used in combination with the outdoor unit and control box EKCB07CAV3.
- The backup heater can only be connected to the space heating water outlet of the outdoor unit. Other connections are NOT allowed.
- Only one backup heater can be connected to the outdoor unit. It is NOT allowed to combine multiple heater kits in series or parallel.

7.6.2 Precautions when mounting the backup heater

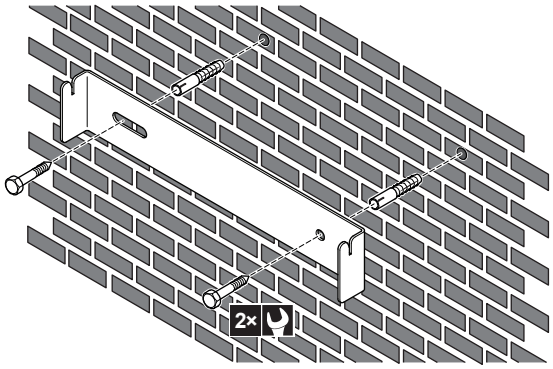
INFORMATION

Also read the precautions and requirements in the following chapters:

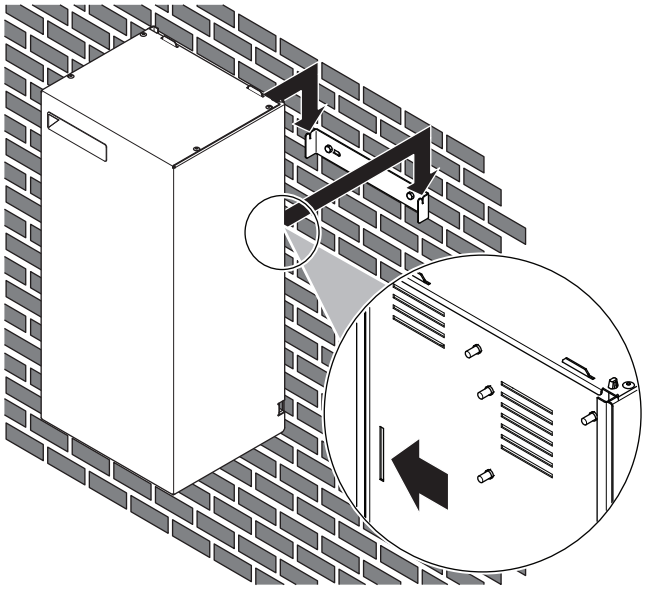
- General safety precautions
- Preparation

7.6.3 To install the backup heater

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



2 Hang the backup heater onto the wall bracket.



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

4 Remove the backup heater from the wall bracket.

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

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

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

7.7 Connecting the water piping

7.7.1 About connecting the water piping

Before connecting the water piping

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

Typical workflow

Connecting the water piping typically consists of the following stages:

1 Connecting the water piping of the outdoor unit.
2 Connecting the water piping of the backup heater and/or the domestic hot water tank (if applicable).
3 Filling the water circuit.
4 Protecting the water circuit against freezing (addition of glycol).
5 Filling the domestic hot water tank (if applicable).
6 Insulating the water piping.

7.7.2 Precautions when connecting the water piping

INFORMATION

Also read the precautions and requirements in the following chapters:

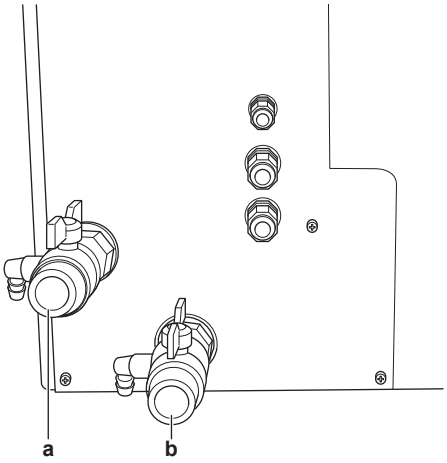
- General safety precautions
- Preparation

7.7.3 To connect the water piping

NOTICE

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

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



a Water inlet
b Water outlet

1 Screw the outdoor unit nuts on the shut-off valves.

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

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

NOTICE

Install a manometer in the system.

NOTICE

Install air purge valves at all local high points.

NOTICE

In case an optional domestic hot water tank is installed: A pressure relief valve (field supply) with an opening pressure of maximum 10 bar must be installed on the domestic cold water inlet connection in accordance with the applicable legislation.

NOTICE

In case an optional domestic hot water tank is installed:

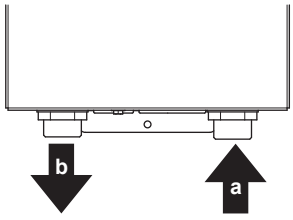
- A drain device and pressure relief device must be installed on the cold water inlet connection of the domestic hot water cylinder.
- To avoid back siphonage, it is recommended to install a non-return valve on the water inlet of the domestic hot water tank in accordance with the applicable legislation.
- It is recommended to install a pressure reducing valve on the cold water inlet in accordance with the applicable legislation.
- An expansion vessel should be installed on the cold water inlet in accordance with the applicable legislation.
- It is recommended to install the pressure relief valve on a higher position than the top of the domestic hot water tank. Heating of the domestic hot water tank causes water to expand and without pressure relief valve the water pressure inside the tank can rise above the tank design pressure. Also the field installation (piping, tapping points, etc.) connected to the tank is subjected to this high pressure. To prevent this, a pressure relief 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.

7.7.4 To connect the water piping to the backup heater

NOTICE

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

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



a Water inlet
b Water outlet

NOTICE

When the backup heater is installed in a reversible system (heating+cooling), and the conditions of "14.4 Valve kit necessity" on page 96 are valid, condensation may occur inside the backup heater. To provide a bypass for the condensate, install valve kit EKMBHBP1. Do NOT install any other valve kit than EKMBHBP1.

INFORMATION

Inside the backup heater, an automatic air purge valve is installed. For instructions on how to perform an air purge, refer to "9.4.2 Air purge function" on page 78.

7.7.5 About the valve kit

INFORMATION

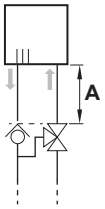
Only applicable to reversible systems (heating+cooling) in which a backup heater is installed.

When installing the backup heater in a reversible system (heating +cooling), and the conditions presented in "14.4 Valve kit necessity" on page 96 are met, condensation may occur inside the backup heater. It is required that a bypass for this condensate be provided.

NOTICE

In case of valve kit malfunction or if problems arise due to incorrect installation, the condensate that occurs inside the backup heater may not get properly bypassed. To prevent the condensate from doing damage, make sure all components installed under the backup heater are resistant to at least dripping water (IPX1).

The installation site requirements for the valve kit depend on the required leaving water temperature setpoint (underfloor heating: 18°C – fan coil units: 5°C) and the material of the piping (copper or Alpex). Provide sufficient space under the backup heater, according to the figure and table below.

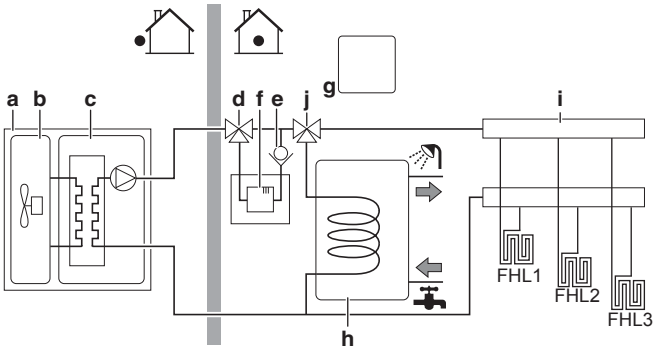


A Minimum required distance between backup heater and valve kit.

Leaving water temperature setpoint	Material of the piping	
	Copper	Alpex[(a)]
18°C	A=25 cm	A=10 cm
5°C	A=50 cm	A=20 cm

(a) Aluminium-reinforced polyethylene

Valve kit EKMBHBP1 contains a check valve and a 3-way valve, which need to be integrated into the system as follows:



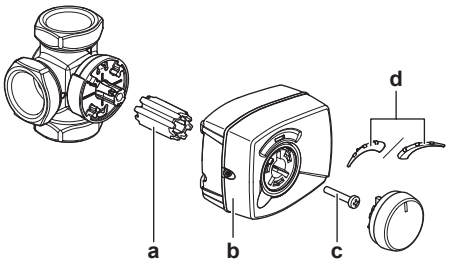
a Outdoor unit
b Refrigerant part of the outdoor unit
c Hydro part of the outdoor unit
d 3-way valve (of valve kit EKMBHBP1)
e Check valve (of valve kit EKMBHBP1)
f Backup heater kit
g Control box
h Domestic hot water tank
i Space heating circuit
j 3-way valve (of the domestic hot water tank)

To connect the check valve

1 Connect the check valve to the water outlet of the backup heater.

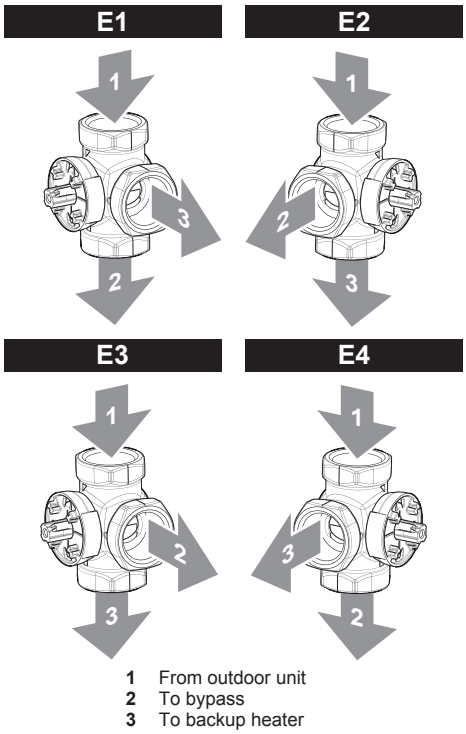
To connect the 3-way valve

1 Unpack the 3-way valve body and 3-way valve motor and verify that the following accessories are provided with the motor.



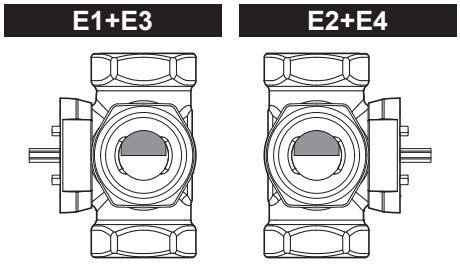
a Sleeve
b Valve motor cover
c Screw
d Scale

2 Connect the 3-way valve body to the water inlet of the backup heater, in accordance with one of the following four configurations. Position the shaft in such a way that the motor can be mounted and replaced.

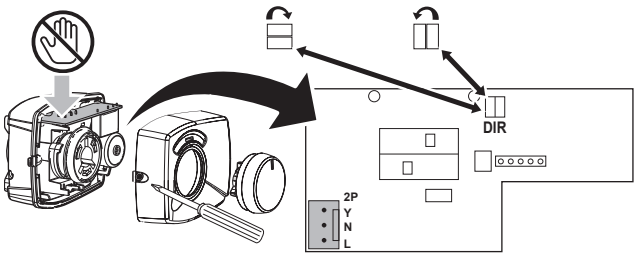


1 From outdoor unit
2 To bypass
3 To backup heater

3 Put the sleeve on the valve and turn it until the valve is positioned as in the figure below. It should be blocking the outlet connection to the bypass for 50% and the outlet connection to the backup heater for 50%.



4 When installing in accordance with configurations E3 or E4, open the valve motor cover by loosening the screw and change the jumper so as to change the rotation direction of the valve.



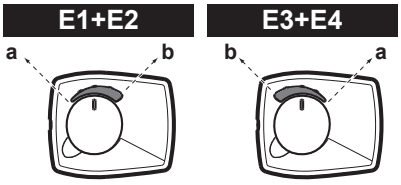
Position of the jumper in case of installation according to configurations E1 and E2.
Position of the jumper in case of installation according to configurations E3 and E4.

INFORMATION

The jumper is factory-set to apply for installation in accordance with configurations E1 and E2.

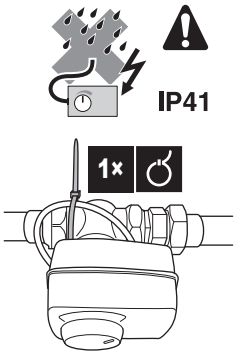
5 Put the knob on the motor in a 12 o'clock position and push the motor on the sleeve. Do NOT rotate the sleeve during this action, so as to maintain the valve position as set during step 4.

6 Put the scale on the valve according to the applicable configuration.



a Bypass
b Backup heater

7 To provide stress relief, fix the power supply cable to the 3-way valve body with a cable tie (field supply). Fix it so that possible condensate cannot enter the 3-way valve motor via the cable.



7.7.6 To protect the water circuit against freezing

Frost can damage the system. To prevent the hydraulic components from freezing, the software is equipped with special frost protection functions, that include the activation of pump, internal heaters, and/or backup heater operation in case of low temperatures.

However, in case of a power failure, these functions cannot guarantee protection. It is therefore recommended to add glycol to the water circuit. The required concentration depends on the lowest expected outdoor temperature, and on whether you want to protect the system from bursting or from freezing. To prevent the system from freezing, more glycol is required. Add glycol according to the table below.

INFORMATION

- Protection against bursting: the glycol will prevent the piping from bursting, but NOT the liquid inside the piping from freezing.
- Protection against freezing: the glycol will prevent the liquid inside the piping from freezing.

Lowest expected outdoor temperature	Prevent from bursting	Prevent from freezing
–5°C	10%	15%
–10°C	15%	25%
–15°C	20%	35%
–20°C	25%	—
–25°C	30%	—

NOTICE

- The required concentration might differ depending on the type of glycol. ALWAYS compare the requirements from the table above with the specifications provided by the glycol manufacturer. If necessary, meet the requirements set by the glycol manufacturer.
- The added concentration of glycol should NEVER exceed 35%.
- If the liquid in the system is frozen, the pump will NOT be able to start. Mind that if you only prevent the system from bursting, the liquid inside might still freeze.
- In case of a power supply failure or pump failure, and NO glycol was added to the system, drain the system.
- When water is at standstill inside the system, the system is very likely to freeze and get damaged.

The types of glycol that can be used depend on whether the system contains a domestic hot water tank:

If…	Then…
The system contains a domestic hot water tank	Only use propylene glycol[(a)]
The system does NOT contain a domestic hot water tank	You can use either propylene glycol[(a)] or ethylene glycol

(a) Propylene glycol, including the necessary inhibitors, classified as Category III according to EN1717.

WARNING

Ethylene glycol is toxic.

NOTICE

Glycol absorbs water from its environment. Therefore do NOT add glycol that has been exposed to air. Leaving the cap off the glycol container causes the concentration of water to increase. The glycol concentration is then lower than assumed. As a result, the hydraulic components might freeze up after all. Take preventive actions to ensure a minimal exposure of the glycol to air.

NOTICE

- If overpressure occurs, the system will release some of the liquid through the pressure relief valve. If glycol was added to the system, take adequate measures so as to safely recover it.
- In any case, make sure that the flexible hose of the pressure relief valve is ALWAYS free to release pressure. Prevent water from staying and/or freezing up inside the hose.

WARNING

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

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

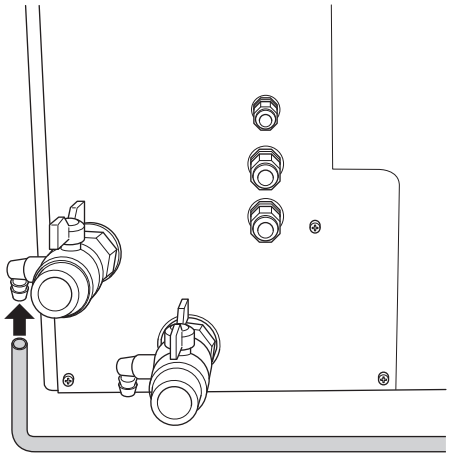
Adding glycol to the water circuit reduces the maximum allowed water volume of the system. For more information, refer to the chapter "To check the water volume and flow rate" in the installer reference guide.

NOTICE

The backup heater is mandatory at ambient temperatures lower than –10°C. If this is not the case the unit will still be protected against freezing, but normal operation can be interrupted.

7.7.7 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 If an automatic air purge valve was installed, make sure it is open.

4 Fill the circuit with water until the manometer (field supply) indicates a pressure of ±2.0 bar.

5 Purge as much air as possible from the water circuit. For instructions, see "9 Commissioning" on page 77.

6 Refill the circuit until the pressure is ±2.0 bar.

7 Repeat steps 5 and 6 until no more air is purged and there are no more pressure drops.

8 Close the drain and fill valve.

9 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.

7.7.8 To fill the domestic hot water tank

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

7.7.9 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.

To prevent the freezing of the outdoor water piping during winter time, the thickness of the sealing material MUST be at least 13 mm (with λ=0.039 W/mK).

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

During winter, protect the water piping and shut-off valves against freezing by adding heat tape (field supply). If the outdoor temperature can drop below –20°C and no heat tape is used, it is recommended to install the shut-off valves indoors.

7.8 Connecting the electrical wiring

7.8.1 About connecting the electrical wiring

Before connecting the electrical wiring

Make sure the water piping is connected.

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

1 Making sure the power supply system complies with the electrical specifications of the units.
2 Connecting the electrical wiring to the outdoor unit (if applicable).
3 Connecting the electrical wiring to control box EKCB07CAV3 (if applicable).
4 Connecting the electrical wiring to option box EK2CB07CAV3 (if applicable).
5 Connecting the electrical wiring to the backup heater (if applicable).
6 Connecting the main power supply
7 Connecting the backup heater power supply (if applicable).
8 Connecting the user interface.
9 Connecting the shut–off valves (if applicable).
10 Connecting the electrical meters (if applicable).
11 Connecting the domestic hot water pump (if applicable).
12 Connecting the alarm output (if applicable).
13 Connecting the space cooling/heating ON/OFF output (if applicable).
14 Connecting the changeover to an external heat source (if applicable).
15 Connecting the power consumption digital inputs (if applicable).

7.8.2 Precautions when connecting the electrical wiring

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

DANGER: RISK OF ELECTROCUTION

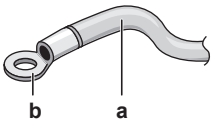
WARNING

ALWAYS use multicore cable for power supply cables.

7.8.3 Guidelines when connecting the electrical wiring

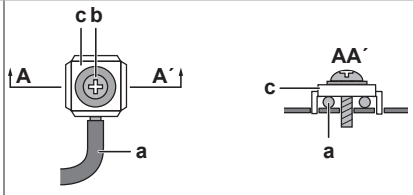
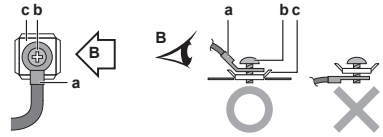
Keep the following in mind:

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



a Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

Wire type	Installation method
Single-core wire	 **a** Curled single-core wire **b** Screw **c** Flat washer
Stranded conductor wire with round crimp-style terminal	 **a** Terminal **b** Screw **c** Flat washer **O** Allowed **X** NOT allowed

Item	Tightening torque (N•m)
Outdoor unit	
X3M	0.8~0.9
X4M	2.2~2.7
X5M	0.8~0.9
X7M	
Control box / option box	
X1M	2.2~2.7
X2M	0.8~0.9

Item	Tightening torque (N•m)
X4M	1.3~1.6
X8M	0.8~0.9
Backup heater	
X15M	0.8~0.9

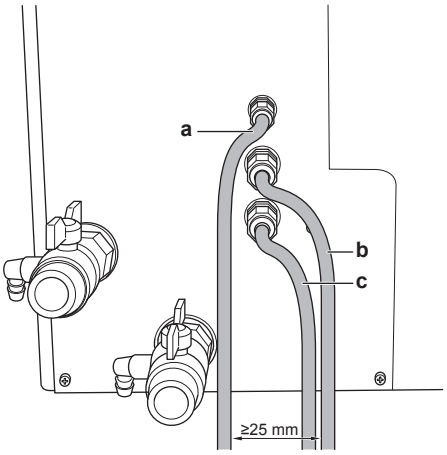
7.8.4 To connect the electrical wiring on the outdoor unit

1 Remove the switch box cover. See "7.2.2 To open the outdoor unit" on page 32.

2 Strip insulation (20 mm) from the wires.

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

3 Insert the wiring from the back of the unit:



a Low voltage cable
b High voltage cable
c Power supply cable

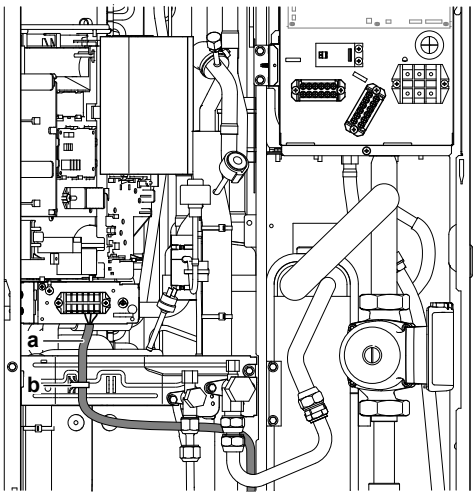
NOTICE

The distance between the high voltage and low voltage cables should be at least 25 mm.

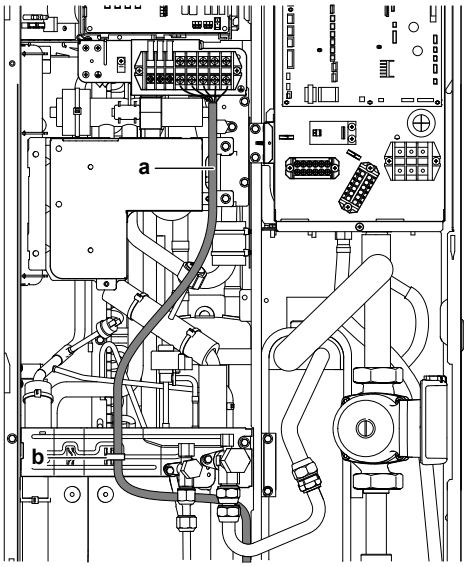
Routing	Possible cables (depends on the installed options)
a Low voltage	▪ User interface ▪ Interconnection cable to control box EKCB07CAV3 ▪ Remote outdoor sensor (option)
b High voltage	▪ Normal kWh rate power supply ▪ Preferential kWh rate power supply ▪ Heat pump convector (option) ▪ Shut-off valve (field supply) ▪ Domestic hot water pump (field supply) ▪ Space heat/cool operation control
c Main power supply	▪ Main power supply

4 Inside the unit, route the wiring as follows:

V3



W1



a Power supply cable
b Cable tie

5 Make sure that the cable does NOT come in contact with sharp edges.

6 Install the switch box cover.

INFORMATION

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

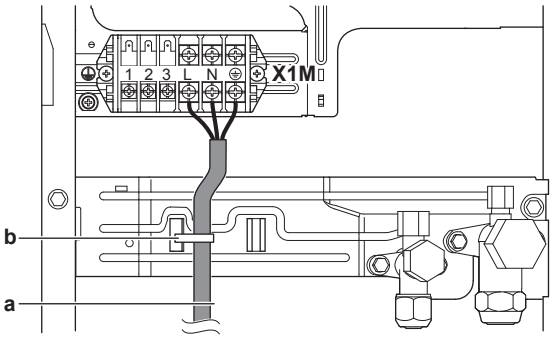
CAUTION

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

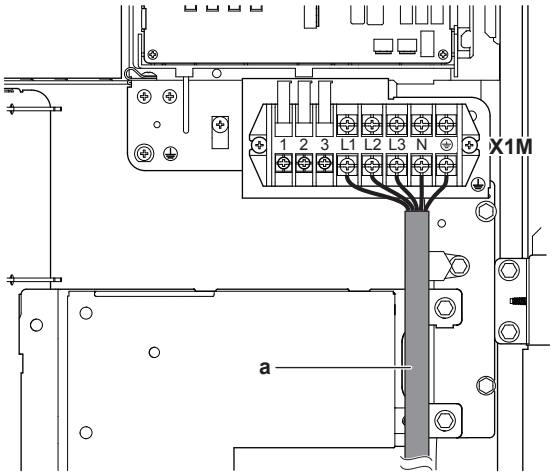
7.8.5 To connect the main power supply

1 Connect the main power supply as follows:

V3



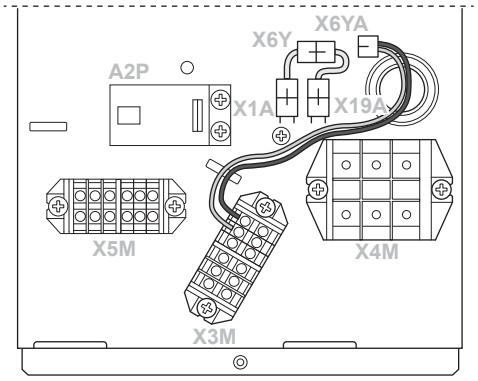
W1



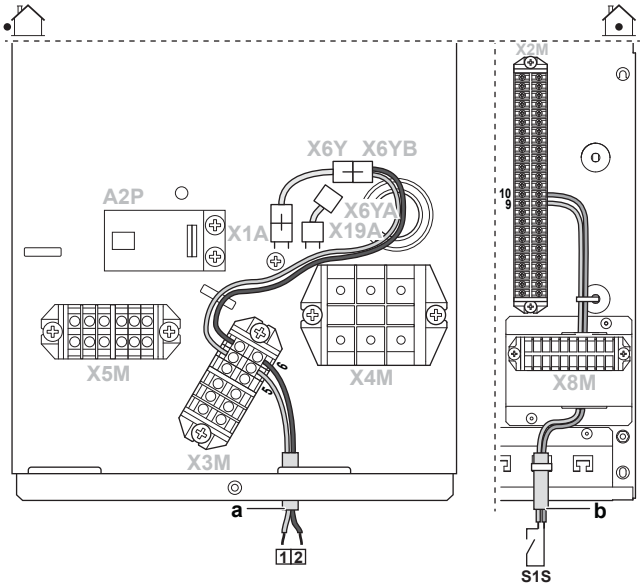
a Power supply cable (including earth)
b Cable tie

2 Open the switch box and route the wiring as follows.

In case of normal kWh rate power supply



In case of preferential kWh rate power supply



a Normal kWh rate power supply
b Preferential power supply contact (on the control box)

INFORMATION

For the exact position of connectors X6Y, X6YA, and X6YB in the switch box, see the service manual.

INFORMATION

In case of preferential kWh rate power supply, the necessity of a separate normal kWh rate power supply to the hydro part of the outdoor unit X3M/5+6 depends on the type of preferential kWh rate power supply.

A separate connection to the hydro part of the outdoor unit is required:

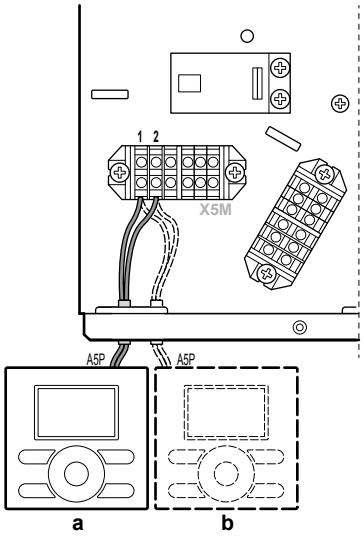
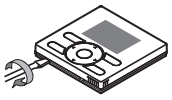
- if preferential kWh rate power supply is interrupted when active, OR
- if no power consumption by the hydro part of the outdoor unit is allowed at the preferential kWh rate power supply when active.

7.8.6 To connect the user interface

Connection to outdoor unit

INFORMATION

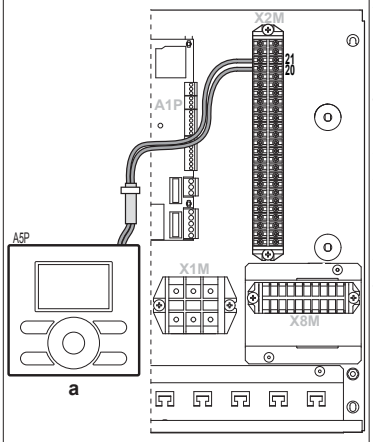
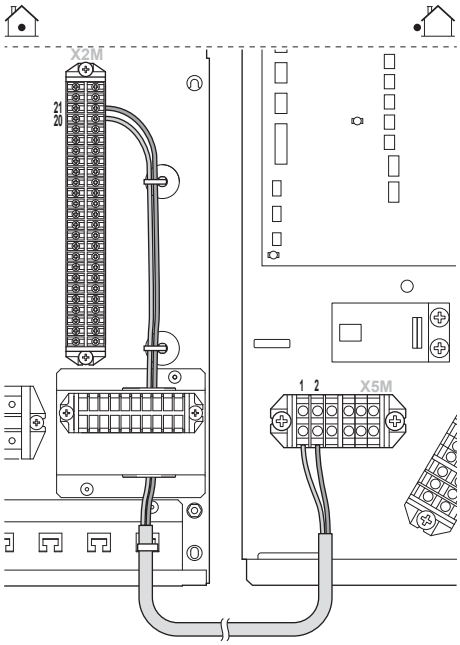
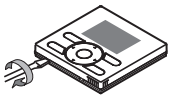
- If control box EKCB07CAV3 is NOT part of the system, connect the user interface directly to the outdoor unit according to the instructions below.
- If control box EKCB07CAV3 is part of the system, connect the user interface to the control box. For instructions, see "Connection to control box" below.

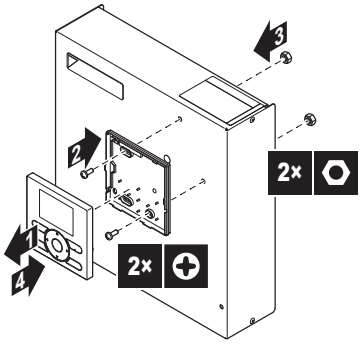
#	Action
1	Connect the user interface cable to the outdoor unit.  **a** Main user interface[(a)] **b** Optional user interface
2	Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate. The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it. 
3	Fix the wallplate of the user interface to the wall.
4	Connect as shown in 4A, 4B, 4C or 4D.
5	Reinstall the faceplate onto the wallplate. Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

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

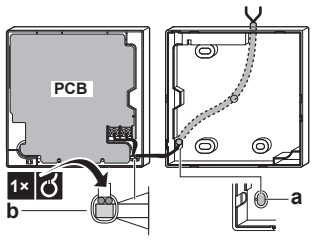
Connection to control box

- If you use 1 user interface, you can connect it onto control box EKCB07CAV3 (for control close to the control box), or in the room (where used as room thermostat).
- If you use 2 user interfaces, you can connect 1 user interface onto control box EKCB07CAV3 (for control close to the control box) + 1 user interface in the room (where used as room thermostat).

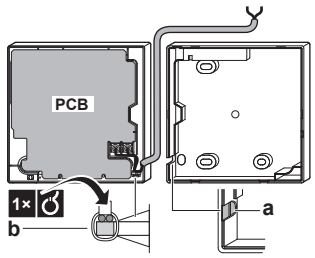
#	Onto control box	In the room
1	Connect the user interface cable to control box terminals X2M/20+21. Fix the cable with cable ties to the cable tie mountings.  **a** Main user interface	Connect the user interface cable to control box terminals X2M/20+21. Route the cable from the right-hand side of the terminals, fasten it to the cable tie mountings and route it through the hole of the low voltage wiring.
2	Connect the control box to the outdoor unit. Fix the cable with cable ties to the cable tie mountings.  	
3	Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wall plate. The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it. 	

#	Onto control box	In the room
4	Fix the wall plate of the user interface to the front panel of the control box using the M4 bolts and nuts from the accessory bag. Be careful NOT to distort the shape of the backside of the user interface by overtightening the mounting screws. 	Fix the wall plate of the user interface to the wall. When NOT connecting a user interface to the control box, do NOT remove the plugs from the holes in the front plate.
5	Connect as shown in 4A.	Connect as shown in 4A, 4B, 4C or 4D.
6	Reconnect the faceplate to the wall plate. Be careful NOT to pinch the wiring when connecting the front panel to the control box.	

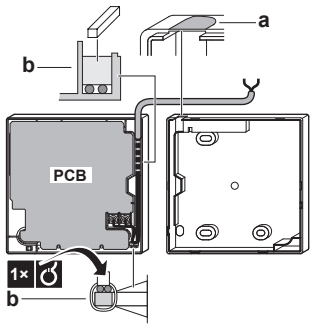
4A From the rear



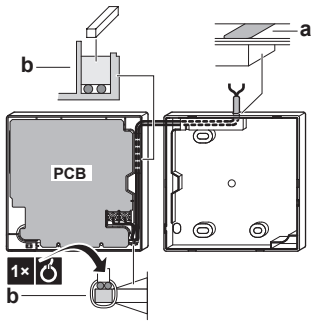
4B From the left



4C From the top



4D From the top centre



a Notch this part for the wiring to pass through with nippers etc.

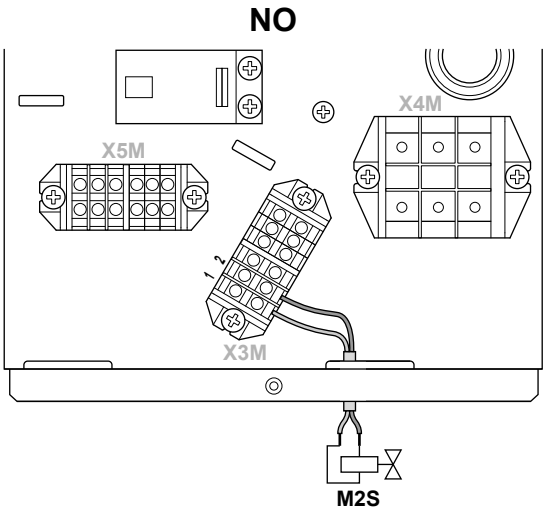
b Secure the wiring to the front part of the casing using the wiring retainer and clamp.

7.8.7 To connect the shut-off valve

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

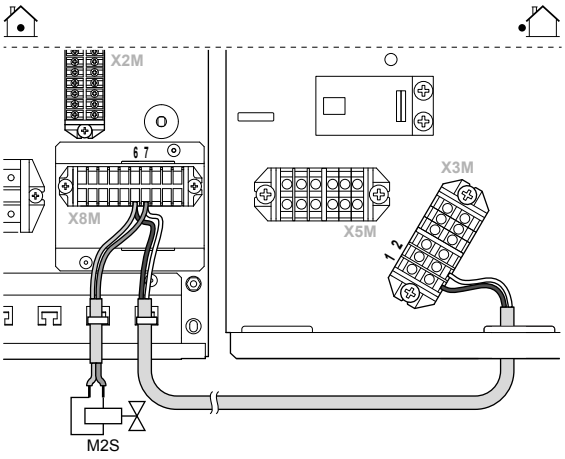
NOTICE

Only connect NO (normal open) valves.



INFORMATION

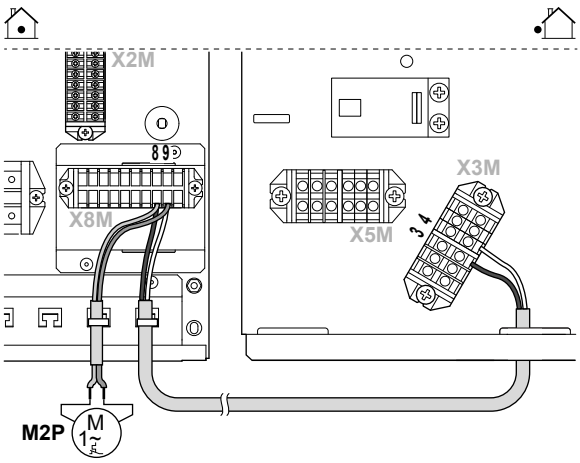
By default, the shut-off valve is to be connected to the outdoor unit. However, if control box EKCB07CAV3 is present in the system, you can also connect it to the control box. To do this, connect outdoor unit terminals X3M/1+2 to control box terminals X8M/6+7, and then connect the shut-off valve to control box terminals X8M/6+7.



7.8.8 To connect the domestic hot water pump

1 Connect outdoor unit terminals X3M/3+4 to the bottom side of terminals X8M/8+9 of control box EKCB07CAV3.

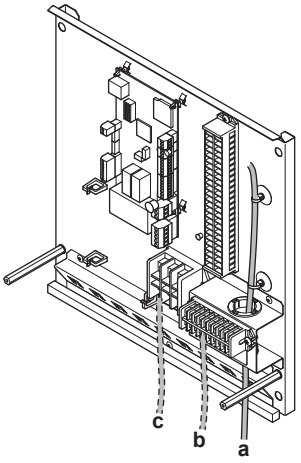
2 Connect the cable of the domestic hot water pump to the bottom side of control box terminals X8M/8+9.



7.8.9 To connect the electrical wiring on the control box

1 Insert the wiring from the bottom of the control box.

2 Make sure the low voltage wiring is located on the right. Route it through the intake hole and fasten it with cable ties.



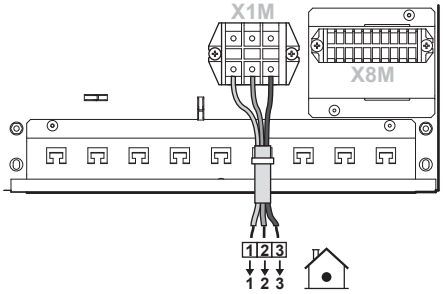
a Low voltage wiring
b High voltage wiring
c Main power supply

NOTICE

The distance between the high voltage and low voltage cables should be at least 25 mm.

7.8.10 To connect the control box power supply

1 Connect the power supply cable to the control box.



1 GND
2 L
3 N

2 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 sharp edges.

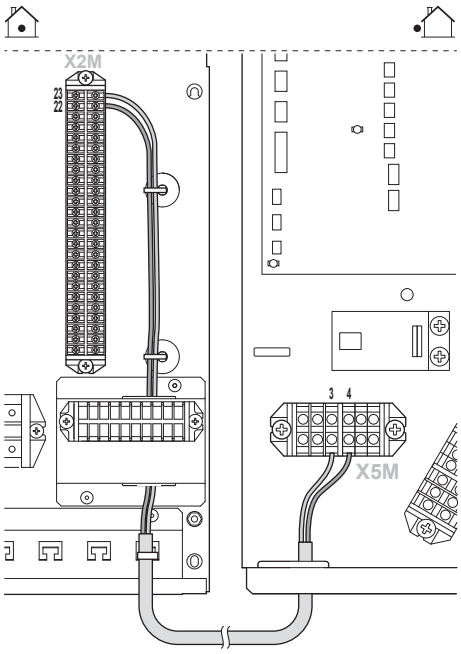
CAUTION

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

7.8.11 To connect the interconnection cable between control box and outdoor unit

1 Connect X2M/22 (control box) to X5M/4 (outdoor unit).

2 Connect X2M/23 (control box) to X5M/3 (outdoor unit).

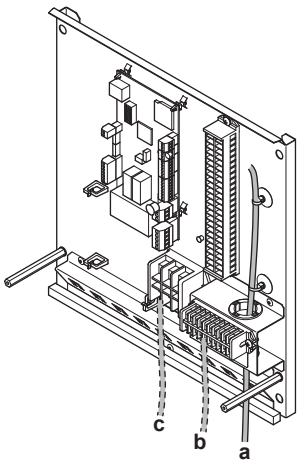


3 Tie the cable with cable ties to the cable tie mountings.

7.8.12 To connect the electrical wiring on the option box

1 Insert the wiring from the bottom of the option box.

2 Make sure the low voltage wiring is located on the right. Route it through the intake hole and fasten it with cable ties:



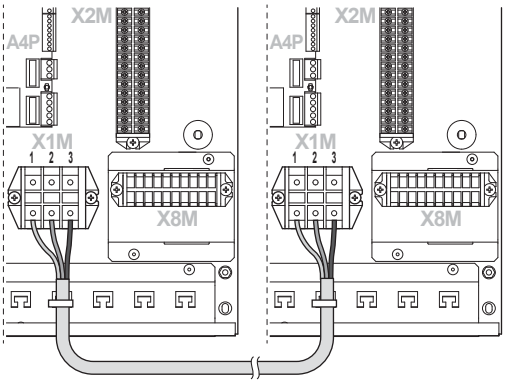
a Low voltage wiring
b High voltage wiring
c Main power supply

NOTICE

The distance between the high voltage and low voltage cables should be at least 25 mm.

7.8.13 To connect the option box power supply

1 Connect option box terminal X1M to control box terminal X1M.



1 GND
2 L
3 N

2 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 sharp edges.

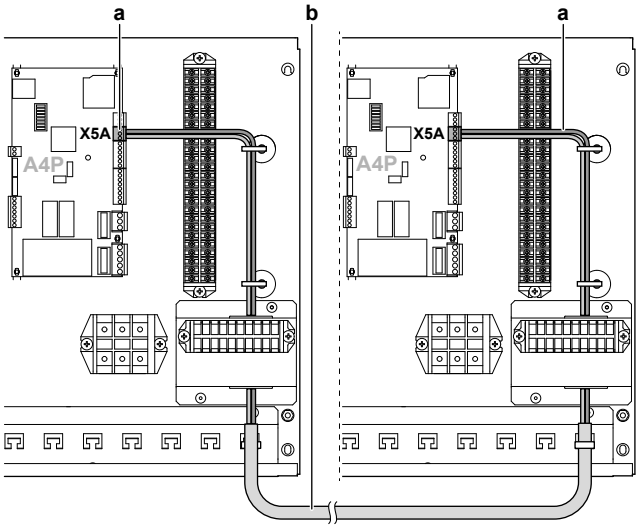
CAUTION

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

7.8.14 To connect the interconnection cable between option box and control box

1 Connect the connectors from the accessory bag to X5A on A1P of both the control box and the option box PCB.

2 Connect the connectors by way of a field-supplied cable.



a Connectors (accessory)
b Interconnection cable (field supply)

7.8.15 To connect the electrical meters

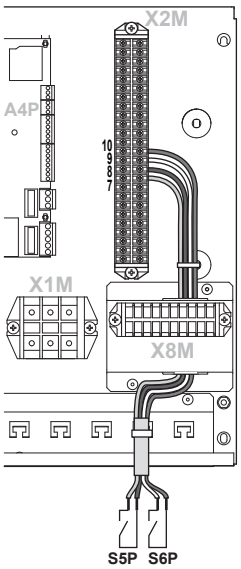
INFORMATION

- Requires option box EK2CB07CAV3.
- To be connected to option box EK2CB07CAV3.

INFORMATION

In case of an electrical meter with transistor output, check the polarity. The positive polarity MUST be connected to X2M/7 and X2M/9; the negative polarity to X2M/8 and X2M/10.

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



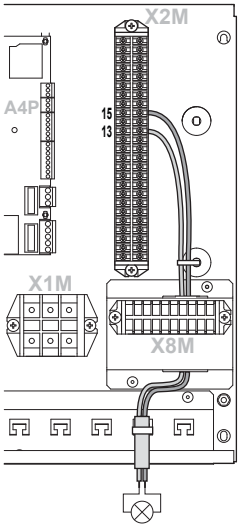
2 Fix the cable with cable ties to the cable tie mountings.

7.8.16 To connect the alarm output

INFORMATION

- Requires option box EK2CB07CAV3.
- To be connected to option box EK2CB07CAV3.

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



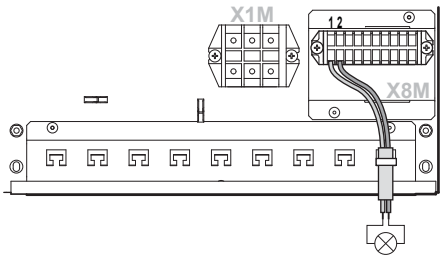
2 Fix the cable with cable ties to the cable tie mountings.

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

INFORMATION

- Requires option box EK2CB07CAV3.
- To be connected to option box EK2CB07CAV3.

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



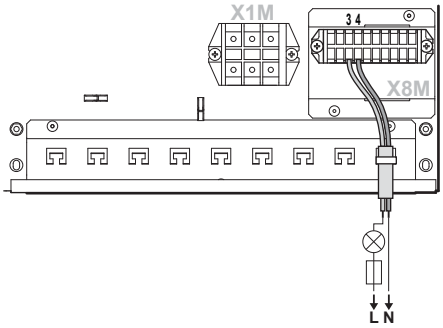
2 Fix the cable with cable ties to the cable tie mountings.

7.8.18 To connect the changeover to external heat source

INFORMATION

- Requires option box EK2CB07CAV3.
- To be connected to option box EK2CB07CAV3.

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



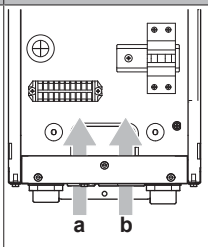
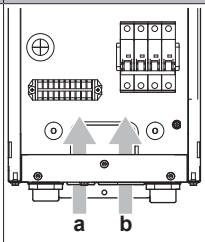
2 Fix the cable with cable ties to the cable tie mountings.

7.8.19 To connect the electrical wiring on the backup heater

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

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

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

Backup heater type	Routing
*3V	 **a** Low voltage wiring **b** High voltage wiring
*9W	 **a** Low voltage wiring **b** High voltage wiring

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

NOTICE

The distance between the high voltage and low voltage cables should be at least 25 mm.

7.8.20 To connect the backup heater power supply

CAUTION

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

CAUTION

If a tank with a built-in electrical booster heater (EKHW) is part of the system, 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.

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

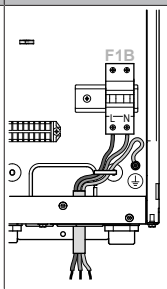
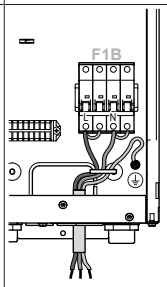
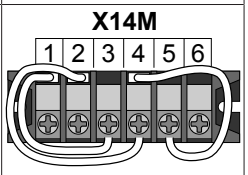
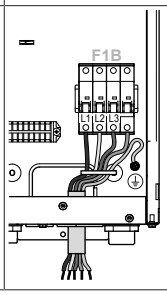
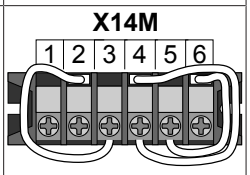
Backup heater type	Backup heater capacity	Power supply	Maximum running current	Z_{max}(Ω)
*3V	3 kW	1~ 230 V	13 A	—
*9W	3 kW	1~ 230 V	13 A	—
	6 kW	1~ 230 V	26 A[(a)(b)]	—
	6 kW	3N~ 400 V	8.6 A	—
	9 kW	3N~ 400 V	13 A	—

(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.).

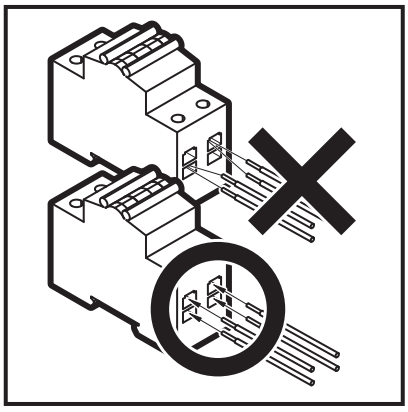
(b) This equipment complies with EN/IEC 61000-3-11 (European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤75 A) provided that the system impedance Z_{sys} is less than or 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, a double-pole fuse is used for F1B. For *9W models, a 4-pole fuse is used for F1B.

2 If required, modify the connection on terminal X14M.

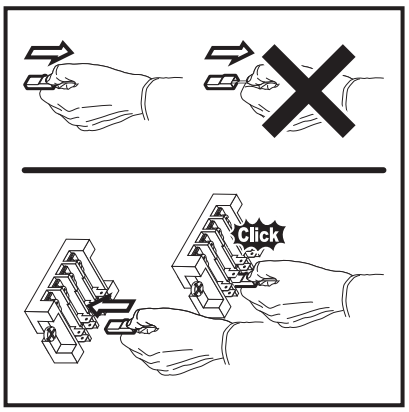
Backup heater type	Connections to backup heater power supply	Connections to terminals
3 kW 1~ 230 V (*3V)		—
3 kW 1~ 230 V (*9W) 6 kW 1~ 230 V (*9W)		
6 kW 3N~ 400 V (*9W) 9 kW 3N~ 400 V (*9W)		

Special remark for fuses:



Special remark for terminals:

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



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

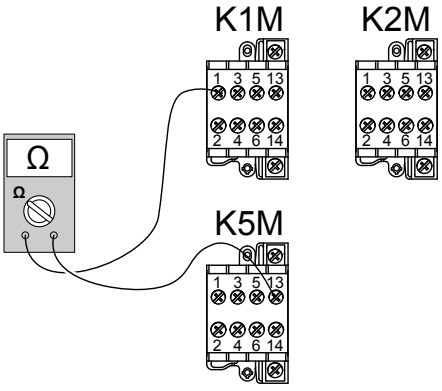
INFORMATION

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

During connection of the backup heater, miswiring is possible. To detect possible miswiring on the *9W model, 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 3N~ 400 V	9 kW 3N~ 400 V
K1M/1	K5M/13	52.9Ω	52.9Ω	∞	∞
	K1M/3	∞	105.8Ω	105.8Ω	105.8Ω
	K1M/5	∞	158.7Ω	105.8Ω	105.8Ω
K1M/3	K1M/5	26.5Ω	52.9Ω	105.8Ω	105.8Ω
K2M/1	K5M/13	∞	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
K1M/5	K2M/1	∞	132.3Ω	∞	∞

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



7.8.21 To connect the backup heater kit to the control box

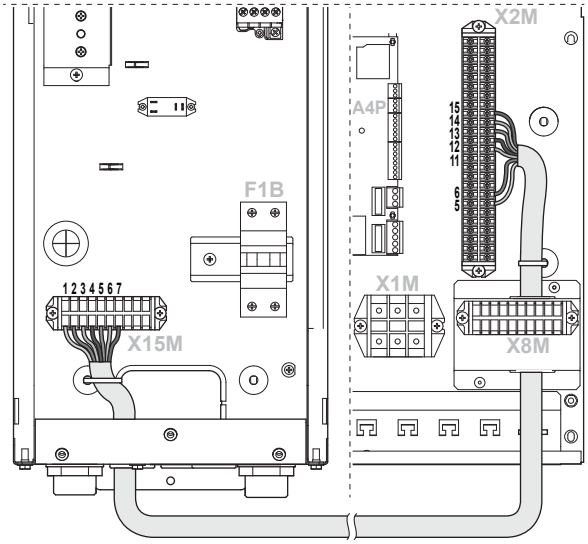
INFORMATION

- Requires to be connected to control box EKCB07CAV3.

1 For the thermistor, connect 2 wires between backup heater terminals X15M/1+2 and control box terminals X2M/5+6.

2 For the thermal protector, connect 2 wires between backup heater terminals X15M/3+4 and control box terminals X2M/11+12.

3 For the connection with the control box, connect 3 wires between backup heater terminals X15M/5+6+7 and control box terminals X2M/13+14+15.



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

INFORMATION

- For details about the connections, refer to the wiring diagram.
- Use a multi-core cable.
- For backup heater kit EKMBUHCA3V3, it is NOT required to make a connection between backup heater terminal X15M/6 and control box terminal X2M/14.

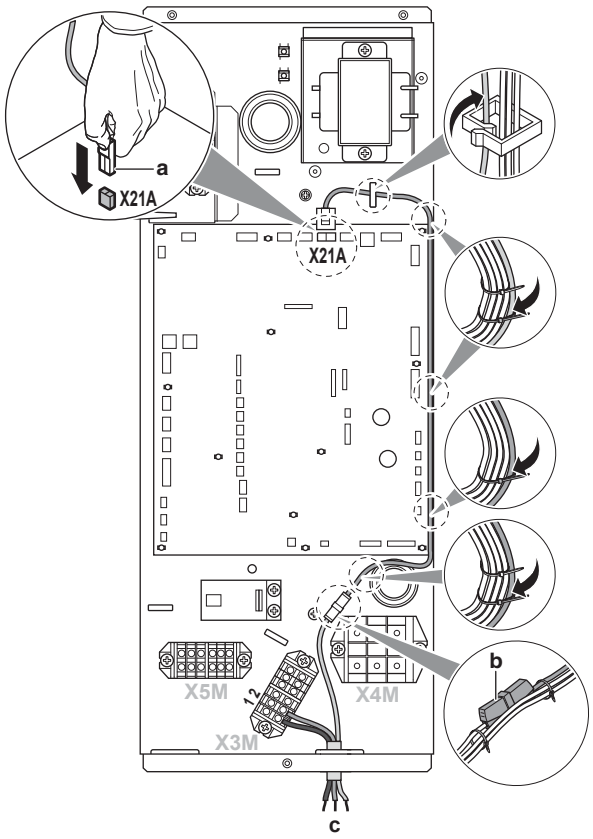
7.8.22 To connect the valve kit

INFORMATION

Only applicable to reversible systems (heating+cooling) in which a backup heater is installed.

1 Connect the connector that makes one end of the connector cable (a) to X21A of outdoor unit PCB A1P and route it according to the illustration below.

2 Using field wiring and the clamp terminal that makes the other end of the connector cable (b), make a connection to control box terminal X8M/10, and connect outdoor unit terminals X3M/1+2 to control box terminals X8M/6+7.



a Connector – one end of connector cable
b Clamp terminal – other end of connector cable
c To control box

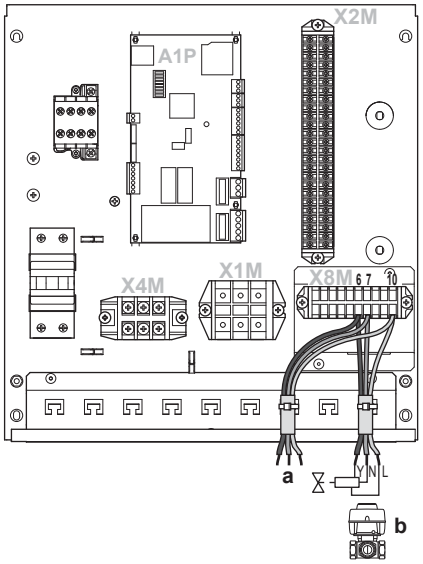
WARNING

Provide stress relief to the valve kit connector cable by attaching it to the cable bundle. Put tie wraps on both sides of the clamp terminal. Failure to follow this warning may lead to short-circuit and fire.

3 Connect the 3-way valve that is part of the valve kit to control box terminals X8M/6+7+10.

NOTICE

When connecting multiple wires to the same terminal, make sure they have the same thickness.



a From outdoor unit
b 3-way valve
Y To X8M/6
N To X8M/7
L To X8M/10

7.9 Finishing the outdoor unit installation

7.9.1 To close the outdoor unit

1 Close the switch box cover.

2 Mount the top plate and the front plate.

NOTICE

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

7.10 Finishing the control box installation

7.10.1 To close the control box

1 Close the front plate.

7.11 Finishing the option box installation

7.11.1 To close the option box

1 Close the front plate.

7.12 Finishing the backup heater installation

7.12.1 To close the backup heater

1 Close the switch box cover.

2 Close the front plate.

8 Configuration

8.1 Overview: Configuration

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

Why

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

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

How

You can configure the system using two different methods.

Method	Description
Configuring via the user interface	**First time – Quick wizard.** When you turn ON the user interface for the first time (via the indoor unit), a quick wizard starts to help you configure the system. **Afterwards.** If necessary, you can make changes to the configuration afterwards.
Configuring via the PC configurator	You can prepare the configuration off-site on PC and afterwards upload the configuration to the system with the PC configurator. See also: "8.1.1 To connect the PC cable to the switch box" on page 50.

INFORMATION

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

Accessing settings – Legend for tables

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

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

See also:

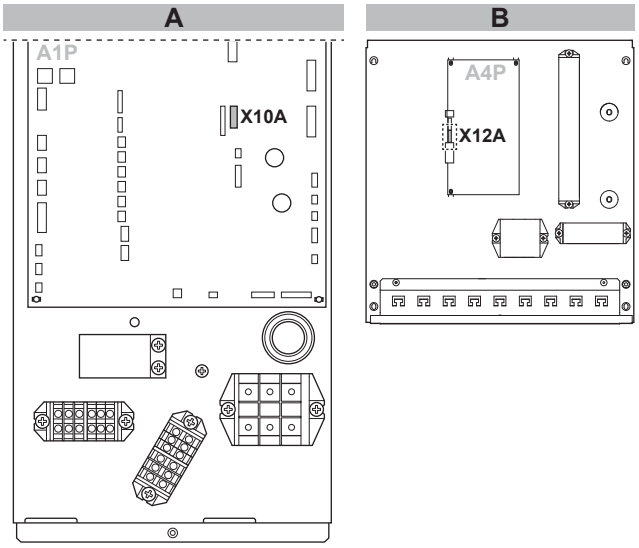
- "To access the installer settings" on page 51
- "8.5 Menu structure: Overview installer settings" on page 76

8.1.1 To connect the PC cable to the switch box

Prerequisite: The EKPCCAB kit is required.

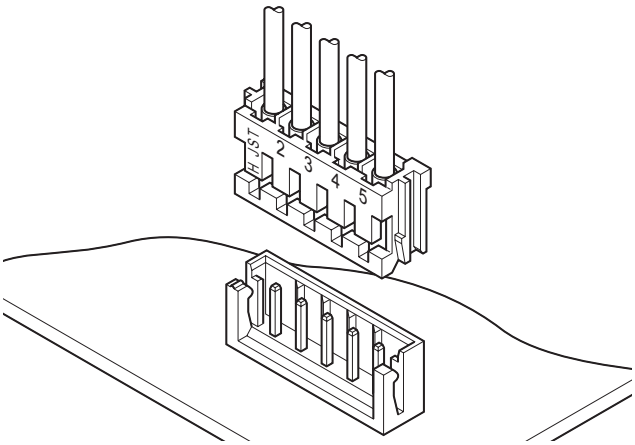
1 Connect the cable with USB connection to your PC.

2 Connect the plug of the cable to X10A on A1P of the switch box of the outdoor unit, or to X12A on A4P of the switch box of control box EKCB07CAV3.



A Outdoor unit switch box
B Control box switch box

3 Pay special attention to the position of the plug!



NOTICE

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

8.1.2 To access the most used commands

To access the installer settings

1 Set the user permission level to Installer.

2 Go to [A]: > Installer settings.

To access the overview settings

1 Set the user permission level to Installer.

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

To set the user permission level to Installer

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

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

3 Press for more than 4 seconds.

Result: is displayed on the home pages.

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

To set the user permission level to Advanced end user

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

2 Press for more than 4 seconds.

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

To set the user permission level to End user

1 Press for more than 4 seconds.

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

To modify an overview setting

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

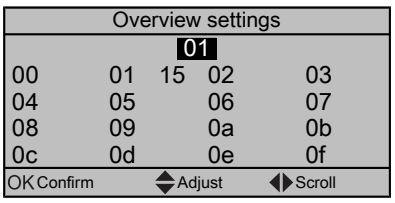
1 Go to [A.8]: > Installer settings > Overview settings.

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

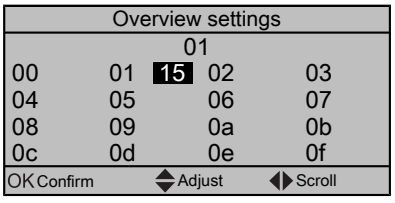
INFORMATION

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

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

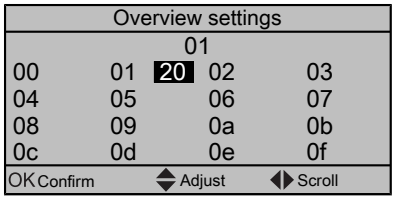


3 Go to the corresponding second part of the setting by using the and button.



Result: The value to be modified is now highlighted.

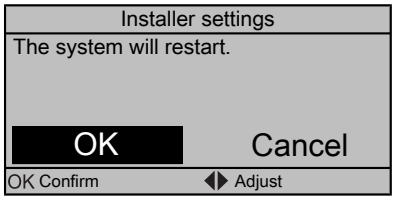
4 Modify the value by using the and button.



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

6 Push to confirm the modification of the parameter.

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



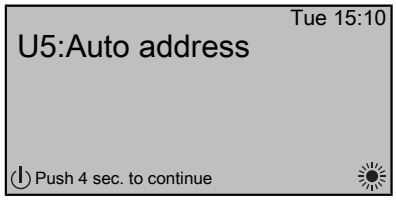
Result: The system will restart.

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

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

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

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



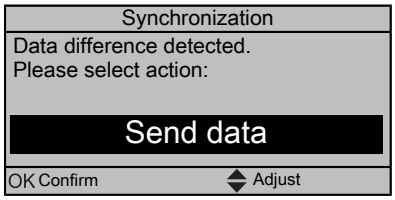
2 Push for 4 seconds on the user interface on which you want to proceed to the quick wizard. This user interface is now the main user interface.

INFORMATION

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

3 The quick wizard will guide you.

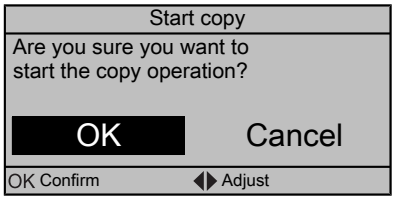
4 For proper operation of the system, the local data on the two user interfaces must be the same. If this is NOT the case, both user interfaces will display:



5 Select the required action:

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

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



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

INFORMATION

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

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

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

See "8.1.3 To copy the system settings from the first to the second user interface" on page 51.

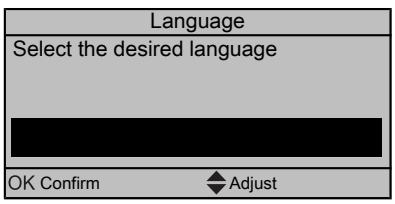
8.1.5 Quick wizard: Set the system layout after first power ON

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

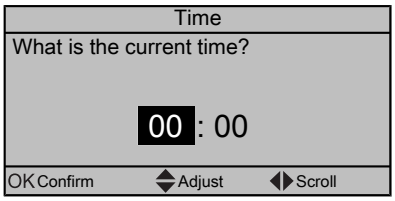
- language,
- date,
- time,
- system layout.

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

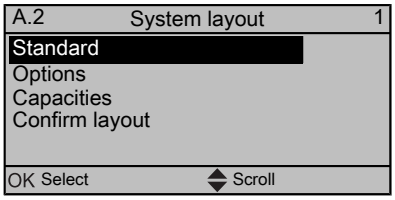
1 At power ON, the quick wizard starts as long as the system layout was NOT confirmed yet, by setting the language.



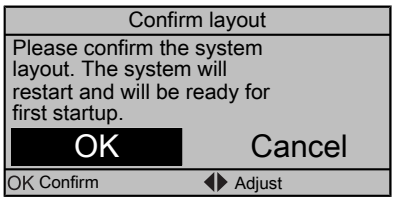
2 Set the current date and time.



3 Set the system layout settings: Standard, Options, Capacities. For more details, see "8.2 Basic configuration" on page 52.



4 After configuration, select Confirm layout and press OK.



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

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

8.2 Basic configuration

8.2.1 Quick wizard: Language / time and date

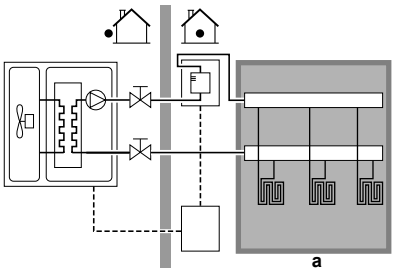
#	Code	Description
[A.1]	N/A	Language
[1]	N/A	Time and date

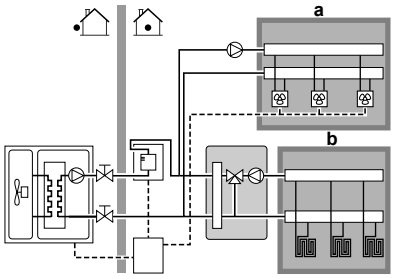
8.2.2 Quick wizard: Standard

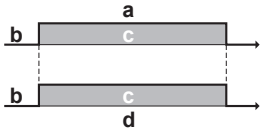
Space heating/cooling settings

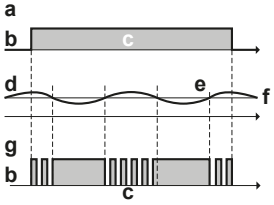
The system can heat up or cool down a space. Depending on the type of application, the space heating/cooling settings must be made accordingly.

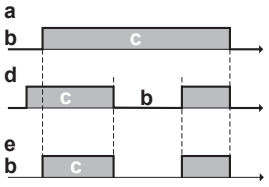
#	Code	Description
[A.2.1.7]	[C-07]	Unit control method: ▪ 0 (LWT control): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating or cooling demand of the room. ▪ 1 (Ext RT control): Unit operation is decided by the external thermostat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

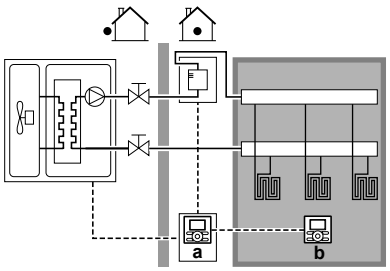
#	Code	Description
[A.2.1.8]	[7-02]	The system can supply leaving water to up to 2 water temperature zones. During configuration, the number of water zones must be set. Number of LWT zones: ▪ 0 (1 LWT zone)(default): Only 1 leaving water temperature zone. This zone is called the main leaving water temperature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

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

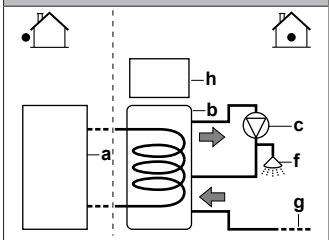
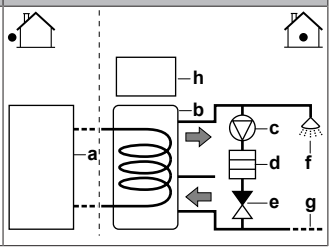
#	Code	Description
[A.2.1.9]	[F-0D]	When the space heating/cooling control is OFF by the user interface, the pump is always OFF. When the space heating/cooling control is On, you can select the desired pump operation mode (only applicable during space heating/cooling) Pump operation mode: ▪ 0 (Continuous):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

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

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

#	Code	Description
[A.2.1.B]	N/A	Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):  ▪ a: At unit ▪ b: In room as room thermostat User interface location: ▪ 0 (At unit): the other user interface is automatically set to In room and if RT control is selected act as room thermostat. ▪ 1 (In room)(default): the other user interface is automatically set to At unit and if RT control is selected to act as room thermostat.
[A.2.1.C]	[E-0D]	Glycol present: ▪ 0 (No) (default): No glycol was added to the water circuit. ▪ 1 (Yes): Glycol was added to the water circuit to protect it against freezing.

#	Code	Description
[A.2.2.A]	[D-02]	The outdoor unit offers the possibility to connect a field supplied domestic hot water pump (On/OFF type). Depending on the installation and configuration on the user interface, we distinguish its functionality. DHW pump: ▪ 0 (No)(default): NOT installed. ▪ 1 (Secondary rtrn): Installed for instant hot water when water is tapped. The end-user sets the operation timing (weekly schedule time) of the domestic hot water pump when it should run. Control of this pump is possible through the outdoor unit. ▪ 2 (Disinf. shunt): Installed for disinfection. It runs when the disinfection function of the domestic hot water tank is running. No further settings are needed. ▪ 3 (Circul. Pump): Installed for tank preheating. It runs when the domestic hot water tank is being preheated. No further settings are needed. ▪ 4 (CP & disinf. Sh): Combination of 2 and 3. It runs when the disinfection function of the domestic hot water tank is running, or when the domestic hot water tank is being preheated. No further settings are needed. See also illustrations below.

Domestic hot water pump installed for…	
Instant hot water	Disinfection
	

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

INFORMATION

The correct domestic hot water default settings becomes only applicable when domestic hot water operation is activated ([E-05]=1).

Remote outdoor sensor

See "5 Application guidelines" on page 13.

8.2.3 Quick wizard: Options

External domestic hot water pump

This chapter only applies to systems with a domestic hot water tank installed. A domestic hot water tank is available as an option.

Following settings must be made accordingly.

#	Code	Description
[A.2.2.B]	[C-08]	External sensor (outdoor): When an optional external ambient sensor is connected, the type of the sensor must be set. See "5 Application guidelines" on page 13. ▪ 0 (No)(default): NOT installed. The thermistor in the user interface and in the outdoor unit are used for measurement. ▪ 1 (Outdoor sensor): Remote outdoor sensor, connected to the outdoor unit. 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): Remote indoor sensor, connected to option box EK2CB07CAV3. The temperature sensor in the user interface is NOT used anymore. **Remark:** This value has only meaning in room thermostat control.

INFORMATION

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

Control box EKCB07CAV3

Modification of these settings is only required when optional control box EKCB07CAV3 is installed. Control box EKCB07CAV3 has multiple functionalities which need to be configured. See "5 Application guidelines" on page 13.

#	Code	Description
[A.2.2.E.1]	[E-03]	Backup heater steps: ▪ 0 (default) ▪ 1 ▪ 2
[A.2.2.E.2]	[5-0D]	BUH type: ▪ 1 (1P,(1/1+2)): 6 kW 1~ 230 V (default) ▪ 4 (3PN,(1/2)): 6 kW 3N~ 400 V (*9W) ▪ 5 (3PN,(1/1+2)): 9 kW 3N~ 400 V (*9W)

The system allows for the connection of 2 types of backup heater kits:

- EKMBUHCA3V3: 1~ 230 V - 3 kW backup heater
- EKMBUHCA9W1: Unified backup heater

Backup heater EKMBUHCA3V3 can only be configured to be a 3V3 backup heater. Unified backup heater EKMBUHCA9W1 can be configured in 4 ways:

- 3V3: 1~ 230 V, 1 step of 3 kW
- 6V3: 1~ 230 V, 1st step = 3 kW, 2nd step = 3+3 kW
- 6W1: 3N~ 400 V, 1st step = 3 kW, 2nd step = 3+3 kW
- 9W1: 3N~ 400 V, 1st step = 3 kW, 2nd step = 3+6 kW

To configure the backup heater (both EKMBUHCA3V3 and EKMBUHCA9W1), combine settings [E-03] and [5-0D]:

Backup heater configuration	[E-03]	[5-0D]
3V3	1	1 (1P,(1/1+2))
6V3	2	1 (1P,(1/1+2))
6W1	2	4 (3PN,(1/2))
9W1	2	5 (3PN,(1/1+2))

#	Code	Description
[A.2.2.E.4]	[E-05]	DHW operation: Can the system prepare domestic hot water? ▪ 0 (No): NOT installed. (Default) ▪ 1 (Yes): Installed
N/A	[E-07]	During domestic hot water preparation, the heat pump can be assisted by an electrical heater to ensure the domestic hot water preparation even for high desired tank temperatures. DHW tank type: ▪ 0 (EKHWS): DHW tank with booster heater installed at the side of the tank. (Default). ▪ 5 (EKHWP): DHW tank with booster heater installed at the top of the tank.
[A.2.2.E.5]	[C-05]	Contact type main In external room thermostat control, the contact type of the optional room thermostat or heat pump convector for the main leaving water temperature zone must be set. See "5 Application guidelines" on page 13. ▪ 1 (Thermo ON/OFF) (default): 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 control box (X2M/1). Select this value in case of a connection to the heat pump convector (FWXV). ▪ 2 (H/C request): 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 control box (X2M/1 and 1a). Select this value in case of connection with the wired (EKRTWA) or wireless (EKRTR1) room thermostat. If there are two zones (main+additional), then only Thermo ON/OFF is possible.

#	Code	Description
[A.2.2.E.6]	[C-06]	Contact type add. In external room thermostat control with 2 leaving water temperature zones, the type of the optional room thermostat for the additional leaving water temperature zone must be set. See "5 Application guidelines" on page 13. ▪ 1 (Thermo ON/OFF): See Contact type main. Connected on the indoor unit (X2M/1a). ▪ 2: N/A If there are two zones (main+additional), then only Thermo ON/OFF is possible.

Option box EK2CB07CAV3

Modification of these settings is only required when option box EK2CB07CAV3 is installed. Option box EK2CB07CAV3 has multiple functionalities which need to be configured. See "5 Application guidelines" on page 13.

#	Code	Description
[A.2.2.F.1]	[C-02]	Ext. backup heat src Indicates if the space heating is also performed by means of another heat source than the system. ▪ 0 (No)(default): NOT installed. ▪ 1 (Bivalent): Installed. The auxiliary boiler (gas boiler, oil burner) will operate when the outdoor ambient temperature is low. During bivalent operation, the heat pump is turned OFF. Set this value in case an auxilillary boiler is used. See "5 Application guidelines" on page 13. ▪ 2: N/A ▪ 3: N/A
[A.2.2.F.2]	[C-09]	Alarm output Indicates the logic of the alarm output on option box EK2CB07CAV3 during a malfunction. ▪ 0 (Normally open)(default): The alarm output will be powered when an alarm occurs. By setting this value, a distinction is made between malfunctioning and detection of a power failure of the unit. ▪ 1 (Normally closed): The alarm output will NOT be powered when an alarm occurs. This installer setting allows for a distinction between the detection of an alarm, and the detection of a power failure. Also see the table below (Alarm output logic).
[A.2.2.F.3]	[D-08]	Optional external kWh meter 1: ▪ 0 (No): NOT installed ▪ 1: Installed (0.1 pulse/kWh) ▪ 2: Installed (1 pulse/kWh) ▪ 3: Installed (10 pulse/kWh) ▪ 4: Installed (100 pulse/kWh) ▪ 5: Installed (1000 pulse/kWh)

#	Code	Description
[A.2.2.F.4]	[D-09]	Optional external kWh meter 2: ▪ 0 (No): NOT installed ▪ 1: Installed (0.1 pulse/kWh) ▪ 2: Installed (1 pulse/kWh) ▪ 3: Installed (10 pulse/kWh) ▪ 4: Installed (100 pulse/kWh) ▪ 5: Installed (1000 pulse/kWh)

#	Code	Description
[A.2.2.F.5]	[C-08]	External sensor (indoor): When an optional external ambient sensor is connected, the type of the sensor must be set. See "5 Application guidelines" on page 13. ▪ 0 (No): (default) NOT installed. The thermistor in the user interface and in the outdoor unit are used for measurement. ▪ 1 (Outdoor sensor): Remote outdoor sensor, connected to the outdoor unit. 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): Remote indoor sensor, connected to option box EK2CB07CAV3. The temperature sensor in the user interface is NOT used anymore. **Remark:** This value has only meaning in room thermostat control.

INFORMATION

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

#	Code	Description
[A.2.2.F.6]	[D-04]	PCC by digital inputs: ▪ 0 (No) ▪ 1 (Yes)

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

#	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. Default: 0 kW. ▪ 3 kW, 1N~ 230 V: 0 kW ▪ 6 kW, 1N~ 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) Range: 0~10 kW (in steps of 0.2 kW)

8.2.5 Space heating/cooling control

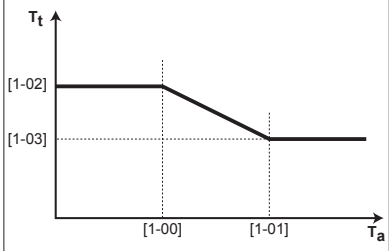
The basic required settings in order to configure the space heating/cooling of your system are described in this chapter. The weather-dependent installer settings define the parameters for the weather-dependent operation of the unit. When weather-dependent operation is active, the water temperature is 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.

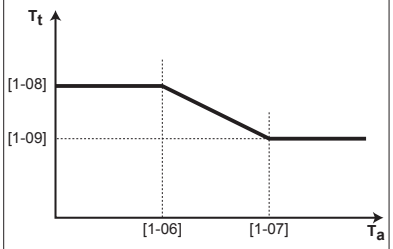
Leaving water temperature: Main zone

#	Code	Description
[A.3.1.1.1]	N/A	LWT setpoint mode: ▪ 0 (Fixed) The desired leaving water temperature is: ▪ NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ 1 (Weather dep.) (default): The desired leaving water temperature is: ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) continued >>

#	Code	Description
[A.3.1.1.1]	N/A	<< continuation ▪ 2 (Fixed/scheduled): The desired leaving water temperature is: ▪ NOT weather-dependent (i.e., does NOT depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired shift actions, either preset or custom. **Remark:** This value can only be set in leaving water temperature control. ▪ 3 (WD/scheduled): The desired leaving water temperature is: ▪ weather-dependent (i.e., does depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired leaving water temperatures either preset or custom. **Remark:** This value can only be set in leaving water temperature control.

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

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

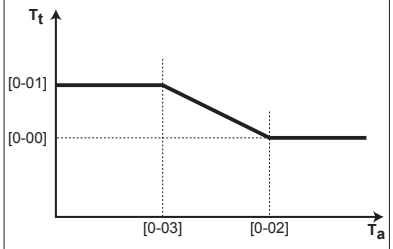
#	Code	Description
[7.7.1.2]	[1-06] [1-07] [1-08] [1-09]	Set weather-dependent cooling:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>

#	Code	Description
[7.7.1.2]	[1-06] [1-07] [1-08] [1-09]	<< continuation ▪ [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 [9-03]°C~[9-02]°C (default: 22°C). **Note:** This value should be higher than [1-09] as for low outdoor temperatures less cold water suffices. ▪ [1-09]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. Between minimum and maximum leaving water temperature [9-03]°C~[9-02]°C (default: 18°C). **Note:** This value should be lower than [1-08] as for high outdoor temperatures colder water is required.

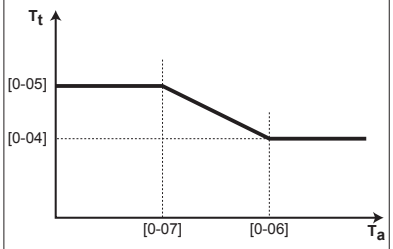
Leaving water temperature: Additional zone

Only applicable if 2 leaving water temperature zones are present.

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

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

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

#	Code	Description
[7.7.2.2]	[0-04] [0-05] [0-06] [0-07]	Set weather-dependent cooling:  ▪ T_t: Target leaving water temperature (additional) ▪ T_a: Outdoor temperature continued >>

#	Code	Description
[7.7.2.2]	[0-04] [0-05] [0-06] [0-07]	<< continuation ▪ [0-07]: Low outdoor ambient temperature. 10°C~25°C (default: 20°C) ▪ [0-06]: High outdoor ambient temperature. 25°C~43°C (default: 35°C) ▪ [0-05]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature [9-07]°C~[9-08]°C (default: 12°C). **Note:** This value should be higher than [0-04] as for low outdoor temperatures less cold water suffices. ▪ [0-04]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. Between minimum and maximum leaving water temperature [9-07]°C~[9-08]°C (default: 12°C). **Note:** This value should be lower than [0-05] as for high outdoor temperatures colder water is required.

Leaving water temperature: Delta T source

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

#	Code	Description
[A.3.1.3.1]	[9-09]	Heating: required temperature difference between entering and leaving water. In case a minimum temperature difference is required for the good operation of the heat emitters in heating mode. Range: 3°C~10°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. In case a minimum temperature difference is required for the good operation of the heat emitters in cooling mode. Range: 3°C~10°C (in steps of 1°C ; default value: 5°C).

Leaving water temperature: Modulation

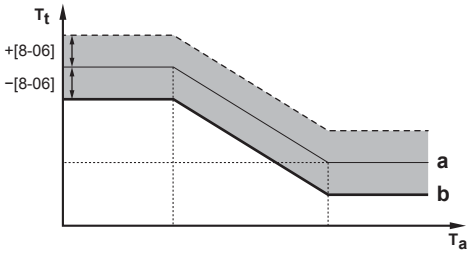
Only applicable in case of room thermostat control. When using the room thermostat functionality, the customer needs to set the desired room temperature. The unit will supply hot water to the heat emitters and the room will be heated. Additionally, also the desired leaving water temperature must be configured: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

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

#	Code	Description
[A.3.1.1.5]	[8-05]	Modulated LWT: ▪ 0 (No): disabled. **Note:** The desired leaving water temperature needs to be set on the user interface. ▪ 1 (Yes)(default): enabled. The leaving water temperature is calculated according to the difference between the desired and the actual room temperature. This creates a better match between the capacity of the heat pump and the actual required capacity, and results in less start/stop cycles and a more economic operation. **Note:** The desired leaving water temperature can only be read out on the user interface
N/A	[8-06]	Leaving water temperature maximum modulation: 0°C~10°C (default: 3°C) Requires modulation to be enabled. This is the value by which the desired leaving water temperature is increased or lowered.

INFORMATION

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



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

Leaving water temperature: Emitter type

Only applicable in case of room thermostat control. Depending on the system water volume and the heat emitters type, the heat up 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: ▪ Quick (default) **Example:** Small water volume and fan coils. ▪ Slow **Example:** Large water volume, floor heating loops.

8.2.6 Domestic hot water control

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

Configuring the desired tank temperature

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

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

See "8.3.2 Domestic hot water control: advanced" on page 65 for more details.

INFORMATION

There is a risk of space heating (cooling) capacity shortage/comfort problem (in case of frequent domestic hot water operation, frequent and long space heating/cooling interruption will happen) when selecting [6-0D]=0 ([A.4.1] Domestic hot water Type=Reheat only) in case of a domestic hot water tank without an internal booster heater.

Maximum DHW temperature setpoint

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

INFORMATION

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

INFORMATION

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

#	Code	Description
[A.4.5]	[6-0E]	Maximum setpoint The maximum temperature that users can select for the domestic hot water. You can use this setting to limit the temperature at the hot water taps. The maximum temperature is NOT applicable during disinfection function. See disinfection function. If ▪ [E-07]=0: 40°C~75°C (in steps of 1°C; default value: 60°C) ▪ [E-07]=5: 40°C~80°C (in steps of 1°C; default value: 80,0°C) The maximum temperature is NOT applicable during disinfection function. See disinfection function.

8.2.7 Contact/helpdesk number

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

8.3 Advanced configuration/ optimization

8.3.1 Space heating/cooling operation: advanced

Preset leaving water temperature

You can define preset leaving water temperatures:

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

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

NOTICE

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

NOTICE

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

#	Code	Description
Preset leaving water temperature for the main leaving water temperature zone in case of NOT weather dependent		
[7.4.2.1]	[8-09]	Comfort (heating) [9-01]°C~[9-00]°C (default: 45°C)
[7.4.2.2]	[8-0A]	Eco (heating) [9-01]°C~[9-00]°C (default: 40°C)

#	Code	Description
[7.4.2.3]	[8-07]	Comfort (cooling) [9-03]°C~[9-02]°C (default: 18°C)
[7.4.2.4]	[8-08]	Eco (cooling) [9-03]°C~[9-02]°C (default: 20°C)
Preset leaving water temperature (shift value) for the main leaving water temperature zone in case of weather dependent		
[7.4.2.5]	N/A	Comfort (heating) –10°C~+10°C (default: 0°C)
[7.4.2.6]	N/A	Eco (heating) –10°C~+10°C (default: –2°C)
[7.4.2.7]	N/A	Comfort (cooling) –10°C~+10°C (default: 0°C)
[7.4.2.8]	N/A	Eco (cooling) –10°C~+10°C (default: 2°C)

Temperature ranges (leaving water temperatures)

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

NOTICE

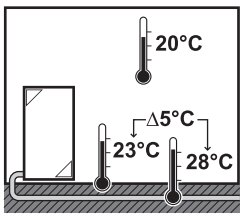
In case of a floor heating application it is important to limit the:

- 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.

NOTICE

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

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



#	Code	Description
Leaving water temperature range for the main leaving water temperature zone (= the leaving water temperature zone with the lowest leaving water temperature in heating operation and the highest leaving water temperature in cooling operation)		
[A.3.1.1.2.2]	[9-00]	Maximum temp (heating) 37°C~55°C (default: 55°C)
[A.3.1.1.2.1]	[9-01]	Minimum temp (heating) 15°C~37°C (default: 25°C)
[A.3.1.1.2.4]	[9-02]	Maximum temp (cooling) 18°C~22°C (default: 22°C)
[A.3.1.1.2.3]	[9-03]	Minimum temp (cooling) 5°C~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°C~55°C (default: 55°C)
[A.3.1.2.2.1]	[9-05]	Minimum temp (heating) 15°C~37°C (default: 25°C)
[A.3.1.2.2.4]	[9-08]	Maximum temp (cooling) 18°C~22°C (default: 22°C)
[A.3.1.2.2.3]	[9-07]	Minimum temp (cooling) 5°C~18°C (default: 5°C)

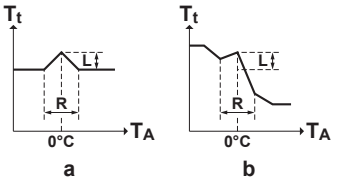
Leaving water temperature overshoot temperature

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°C~4°C (default: 1°C)

Leaving water temperature compensation around 0°C

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



a Absolute desired LWT
b Weather dependent desired LWT

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

Leaving water temperature maximum modulation

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

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

Weather dependent cooling allowance

ONLY applicable for EBLQ011+014+016CAV3 and EBLQ011+014+016CAW1. It is possible to disable weather dependent cooling, meaning the desired leaving water temperature in cooling operation does NOT 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) ▪ 1 (enabled) (default)
N/A	[1-05]	Weather dependent cooling of the additional leaving water temperature zone is… ▪ 0 (disabled) ▪ 1 (enabled) (default)

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°C~30°C (default: 30°C)
[A.3.2.1.1]	[3-07]	Minimum temp (heating) 12°C~18°C (default: 16°C)
[A.3.2.1.4]	[3-08]	Maximum temp (cooling) 25°C~35°C (default: 35°C)
[A.3.2.1.3]	[3-09]	Minimum temp (cooling) 15°C~25°C (default: 15°C)

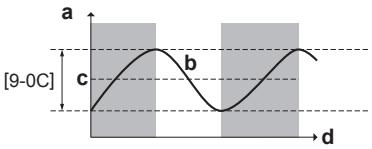
Room temperature step

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

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

Room temperature hysteresis

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



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

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

Room temperature offset

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

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

Room frost protection

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

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

NOTICE

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

INFORMATION

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

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

[C-07]=2: room thermostat control

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

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

INFORMATION

If a U5 error occurs:

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

NOTICE

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

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

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

Additionally, limited frost protection by the unit is possible:

In case of…	…then the following applies:
One leaving water temperature zone	▪ When the leaving water temperature home page is OFF and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered. ▪ When the leaving water temperature home page is ON, the external room thermostat is "Thermo OFF" and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again and the leaving water temperature setpoint will be lowered. ▪ When the leaving water temperature home page is ON and the external room thermostat is "Thermo ON", then room frost protection is guaranteed by the normal logic.
Two leaving water temperature zones	▪ When the leaving water temperature home page is OFF, and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered. ▪ When the leaving water temperature home page is ON, the operation mode is "heating", and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered. ▪ The selection of "cooling" or "heating" is done via the user interface. When the leaving water temperature home page is ON and the operation mode is "cooling", then there is no protection.

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

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

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

- When the leaving water temperature home page is ON and the operation mode is "heating", then the unit will supply leaving water to the heat emitters to heat up the room according to normal logic.
- When the leaving water temperature home page is ON and the operation mode is "cooling", then there is no protection.

Shut-off valve

The shut-off valve is in the main leaving water temperature zone, and is connected to the heating/cooling output.

NOTICE

The output of the shut-off valve is NOT configurable. Do NOT change the value of setting [F-0B]. Only connect NO (normal open) shut-off valves.

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 rises above this value, space heating is turned OFF to avoid overheating.

#	Code	Description
[A.3.3.1]	[4-02]	14°C~35°C (default: 35°C) The same setting is also used in automatic heating/cooling changeover.

Space cooling On temp: ONLY applicable for EBLQ011+014+016CAV3 and EBLQ011+014+016CAW1. When the averaged outdoor temperature drops below this value, space cooling is turned OFF.

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

Automatic heating/cooling changeover

ONLY applicable for EBLQ011+014+016CAV3 and EBLQ011+014+016CAW1. 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 50).

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 rises 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 rises above this value, the operation mode will change to cooling: Range: 14°C~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: Range: 10°C~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. Range: 1°C~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. Range: 1°C~10°C, step 0.5°C (default: 3°C)

8.3.2 Domestic hot water control: advanced

Preset tank temperatures

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

You can define preset tank temperatures:

- storage economic
- storage comfort
- reheat
- reheat hysteresis

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

Storage comfort

When programming the schedule, you can make use of the tank temperatures set as preset values. The tank will then heat up until these setpoint temperatures have been reached. Additionally, a

storage stop can be programmed. This feature puts a stop to tank heating even if the setpoint has NOT been reached. Only program a storage stop when tank heating is absolutely undesirable.

#	Code	Description
[7.4.3.1]	[6-0A]	30°C~[6-0E]°C (default: 55°C)

Storage eco

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

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

Reheat

The desired reheat tank temperature is used:

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

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

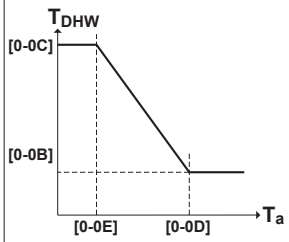
Reheat hysteresis

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

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

Weather dependent

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

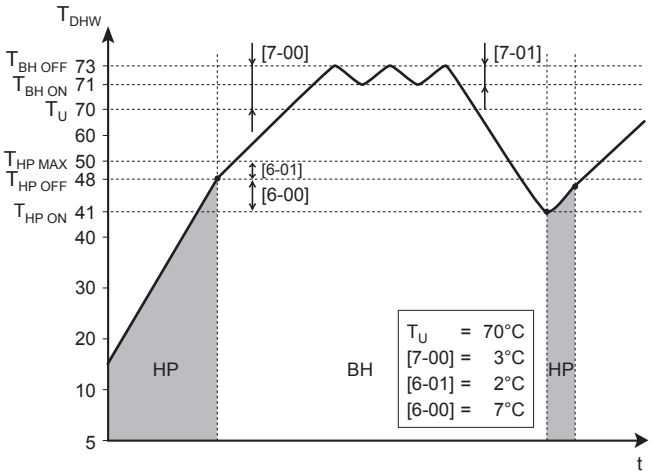
#	Code	Description
[A.4.6]	N/A	Weather dependent desired tank temperature is: ▪ Fixed (default): disabled. All desired tank temperature are NOT weather dependent. ▪ Weather dep.: enabled. In scheduled or scheduled+reheat mode, the storage comfort temperature is weather dependent. Storage economic and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

Booster heater and heat pump operation (for systems with a domestic hot water tank)

#	Code	Description
N/A	[4-03]	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 a domestic hot water tank. ▪ 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: ▪ Ambient temperature is out of the operating range: T_a<[5-03] or T_a>35°C ▪ Domestic hot water temperature is 2°C lower than the heat pump OFF temperature. continued >>

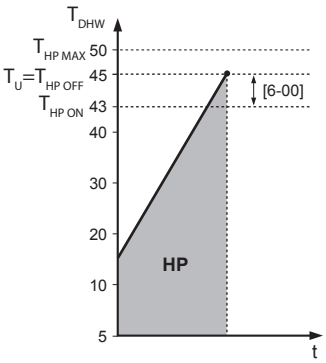
#	Code	Description
N/A	[4-03]	<< continuation The booster heater will be allowed to operate when T_a<[5-03] depends of the status of [5-02]. If bivalent operation is enabled and permission signal for auxiliary boiler is ON, the booster heater will be restricted even when T_a<[5-03]. See [C-02]. ▪ 3 (default): The booster heater is allowed when the heat pump is NOT active in domestic hot water operation. Same as setting 1, but simultaneous heat pump domestic hot water operation and booster heater operation is not allowed. ▪ 4: Booster heater operation is NOT allowed except for "Disinfection function". 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. When setting [4-03]=1/2/3/4, the booster heater operation can still be restricted by the booster heater allowance schedule.
N/A	[7-00]	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. Range: 0°C~4°C (default: 0°C)
N/A	[7-01]	Hysteresis. Temperature difference between booster heater ON and booster heater OFF temperature. The minimum hysteresis temperature is 2°C. Range: 2°C~40°C (default: 2°C)
N/A	[6-00]	The temperature difference determining the heat pump ON temperature. Range: 2°C~20°C (default: 2°C)
N/A	[6-01]	The temperature difference determining the heat pump OFF temperature. Range: 0°C~10°C (default: 2°C)

Example: setpoint (T_U)>maximum heat pump temperature–[6-01] ($T_{HP\ MAX}$–[6-01])



BH Booster heater
HP Heat pump. If heating up time by the heat pump takes too long, auxiliary heating by the booster heater can take place
$T_{BH\ OFF}$ Booster heater OFF temperature (T_U+[7-00])
$T_{BH\ ON}$ Booster heater ON temperature ($T_{BH\ OFF}$−[7-01])
$T_{HP\ MAX}$ Maximum heat pump temperature at sensor in domestic hot water tank
$T_{HP\ OFF}$ Heat pump OFF temperature ($T_{HP\ MAX}$−[6-01])
$T_{HP\ ON}$ Heat pump ON temperature ($T_{HP\ OFF}$−[6-00])
T_{DHW} Domestic hot water temperature
T_U User set point temperature (as set on the user interface)
t Time

Example: setpoint (T_U)≤maximum heat pump temperature–[6-01] ($T_{HP\ MAX}$–[6-01])



HP Heat pump. If heating up time by the heat pump takes too long, auxiliary heating by the booster heater can take place
$T_{HP\ MAX}$ Maximum heat pump temperature at sensor in domestic hot water tank
$T_{HP\ OFF}$ Heat pump OFF temperature ($T_{HP\ MAX}$−[6-01])
$T_{HP\ ON}$ Heat pump ON temperature ($T_{HP\ OFF}$−[6-00])
T_{DHW} Domestic hot water temperature
T_U User set point temperature (as set on the user interface)
t Time

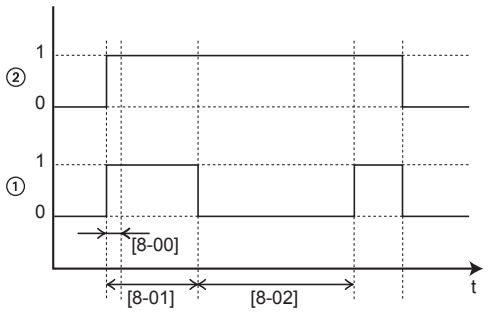
INFORMATION

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

Timers for simultaneous request space and domestic hot water operation

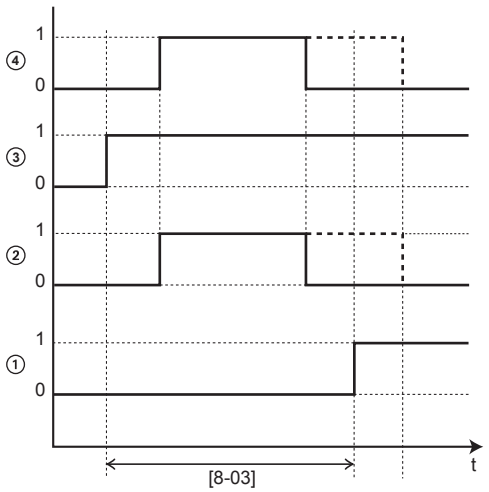
#	Code	Description
N/A	[8-00]	Do not change. (default: 1)
N/A	[8-01]	Maximum running time for domestic hot water operation. Domestic hot water heating stops even when the target domestic hot water temperature is NOT reached. The actual maximum running time also depends on setting [8-04]. ▪ When system layout = Room thermostat control: This preset value is only taken into account if there is a request for space heating or cooling. If there is NO request for space heating/ cooling, the tank is heated until the setpoint has been reached. ▪ When system layout ≠ Room thermostat control: This preset value is always taken into account. Range: 5~95 minutes (default: 30)
N/A	[8-02]	Anti-recycling time. Minimum time between two cycles for domestic hot water. The actual anti-recycling time also depends on setting [8-04]. Range: 0~10 hours (default: 3) (step: 0.5). **Remark:** The minimum time is 1/2 hour even when the selected value is 0.
N/A	[8-03]	Booster heater delay timer. Only for EKHW Start-up delay time for the booster heater when domestic hot water mode is active. ▪ When domestic hot water mode is NOT active, the delay time is 20 minutes. ▪ The delay time starts from 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]=0/2/3/4 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]. Range: 20~95 (default: 50).
N/A	[8-04]	Additional running time for the maximum running time depending on the outdoor temperature [4-02] or [F-01]. Range: 20~95 minutes (default: 50).

[8-02]: Anti-recycling time



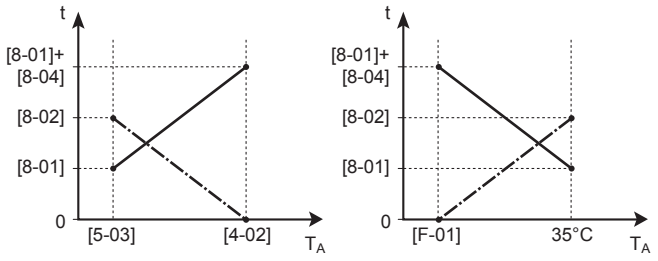
1 Heat pump domestic water heating mode (1=active, 0=not active)
2 Hot water request for heat pump (1=request, 0=no request)
t Time

[8-03]: Booster heater delay timer



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

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



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

Disinfection

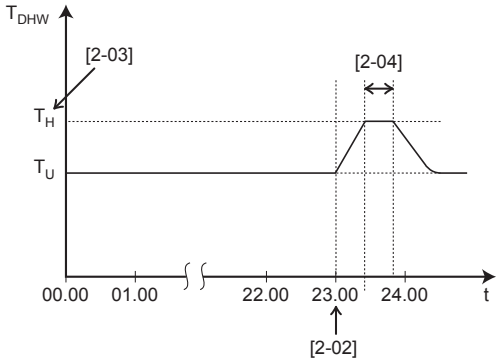
Applies only to installations with a domestic hot water tank.

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

CAUTION

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

#	Code	Description
[A.4.4.2]	[2-00]	Operation day: ▪ 0: Each day ▪ 1: Monday ▪ 2: Tuesday ▪ 3: Wednesday ▪ 4: Thursday ▪ 5: Friday ▪ 6: Saturday ▪ 7: Sunday
[A.4.4.1]	[2-01]	Disinfection ▪ 0: No ▪ 1: Yes
[A.4.4.3]	[2-02]	Start time: 00~23:00, step: 1:00.
[A.4.4.4]	[2-03]	Temperature target: Range: 55°C~75°C (default: 70°C).
[A.4.4.5]	[2-04]	Duration: Range: 5~60 minutes (default: 10 minutes).



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

WARNING

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

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

CAUTION

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

CAUTION

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

INFORMATION

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

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

INFORMATION

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

INFORMATION

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

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

8.3.3 Heat source settings

Backup heater

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

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

Auto emergency

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

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

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

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

INFORMATION

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

INFORMATION

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

INFORMATION

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

Bivalent

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

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

Possibility 1

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

NOTICE

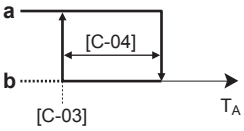
Do NOT use overview settings!

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

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

- [C-03] Bivalent ON temperature: defines the outdoor temperature below which the permission signal for the auxiliary boiler will be active (closed, X8M/3+4 on option box EK2CB07CAV3) and space heating by the outdoor unit will be stopped.
- [C-04] Bivalent hysteresis: defines the temperature difference between bivalent ON temperature and bivalent OFF temperature.

Permission signal X8M/3+4 **(**on option box EK2CB07CAV3**)**



T_A Outdoor temperature
a Closed
b Open

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

Possibility 2

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

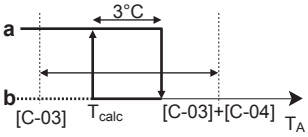
#	Code	Description
[7.4.5.1]	N/A	What is the high electricity price?
[7.4.5.2]	N/A	What is the medium electricity price?
[7.4.5.3]	N/A	What is the low electricity price?
[7.4.6]	N/A	What is the fuel price?

NOTICE

Do NOT use overview settings!

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

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



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

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

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

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

INFORMATION

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

INFORMATION

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

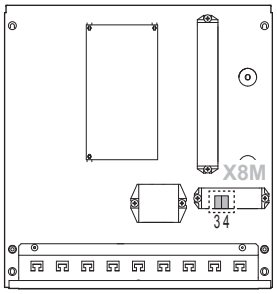
CAUTION

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

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

INFORMATION

- The combination of setting [4-03]=0/2 with bivalent operation at low outdoor temperature can result in domestic hot water shortage.
- The bivalent operation function has no impact on the domestic water heating mode. The domestic hot water is still and only heated by the outdoor unit.
- The permission signal for the auxiliary boiler is located on X8M/3+4 of option box EK2CB07CAV3. When it is activated, contact X8M/3+4 is closed. When it is deactivated, X8M/3+4 is open. See the illustration below for the schematic location of this contact.



8.3.4 System settings

Priorities (for systems with a domestic hot water tank)

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

Auto-restart

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

If the power supply might get interrupted (e.g. preferential kWh rate power supply), always enable the auto restart function. Continuous control of the hydro part of the outdoor unit can be guaranteed independent of the preferential kWh rate power supply status, by connecting the hydro part of the outdoor unit to a normal kWh rate power supply.

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

Preferential kWh rate power supply

#	Code	Description
[A.2.1.6]	[D-01]	Connection to a preferential kWh rate power supply: ▪ 0 (default): The refrigerant part of the outdoor unit is connected to a normal power supply. ▪ 1: The refrigerant part of the outdoor unit is connected to a preferential kWh rate power supply. When the preferential kWh rate signal is sent by the electricity company, the contact will open and the unit will go in forced off mode. When the signal is released again, the voltage-free contact will close and the unit will restart operation. Therefore, always enable the auto restart function. ▪ 2: The refrigerant part of the outdoor unit is connected to a preferential kWh rate power supply. When the preferential kWh rate signal is sent by the electricity company, the contact will close and the unit will go in forced off mode. When the signal is released again, the voltage-free contact will open and the unit will restart operation. Therefore, always enable the auto restart function.
[A.6.2.1]	[D-00]	Which heaters are allowed to operate during preferential kWh rate power supply? ▪ 0 (default): None ▪ 1: Booster heater only ▪ 2: Backup heater only ▪ 3: All heaters See table below. Settings 1, 2 and 3 are only meaningful if the preferential kWh rate power supply is of type 1 or the hydro part of the outdoor unit is connected to a normal kWh rate power supply (via X3M/5+6) and the backup heater and booster heater are NOT connected to the preferential kWh rate power supply.

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

Average timer

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

The outdoor temperature is averaged over the selected time period.

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

Offset temperature external outdoor ambient sensor

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

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

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

Forced defrost

You can manually start a defrost operation.

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

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

Pump operation

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

#	Code	Description
N/A	[F-00]	Pump operation: ▪ 0: Disabled if outdoor temperature is higher than [4-02] 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°C (pump will be activated for 10 minutes and deactivated after 10 minutes). Daikin shall NOT be held liable for any damage resulting this functionality.

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

INFORMATION

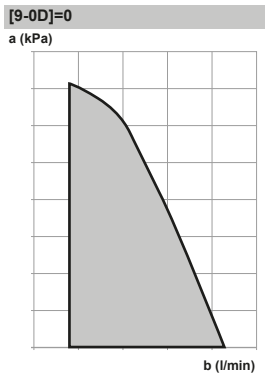
If glycol is present in the system ([E-0D] set to "1") and a flow abnormality occurs, then [F-09] will have NO effect, and the pump will continue operation (intervals of 20 minutes ON – 4 minutes OFF).

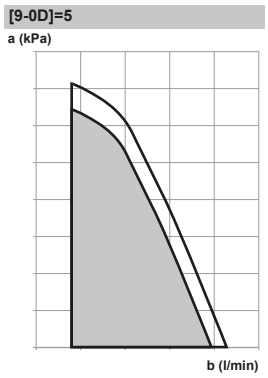
Pump speed limitation

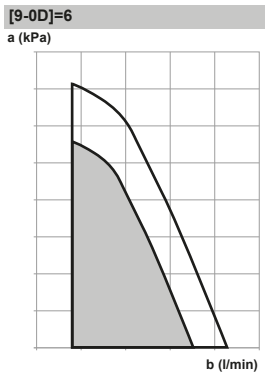
Pump speed limitation [9-0D] defines the maximum pump speed. In normal conditions, the default setting should NOT be modified. The pump speed limitation will be overruled when the flow rate is in the range of the minimum flow (error 7H).

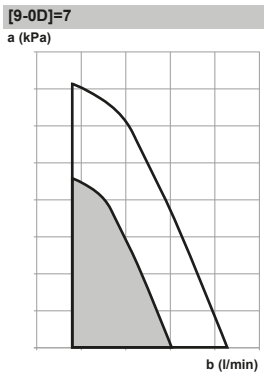
#	Code	Description
N/A	[9-0D]	Pump speed limitation ▪ 0: No limitation. ▪ 1~4: General limitation. There is limitation in all conditions. The required delta T control and comfort are **NOT** guaranteed. ▪ 5~8 (default: 6): Limitation when no actuators. When there is no heating/cooling output, the pump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

The maximum values depend on the unit type:

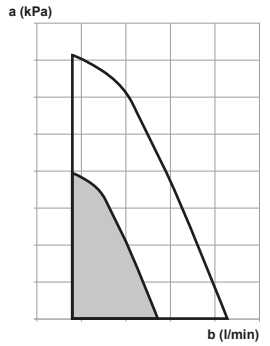






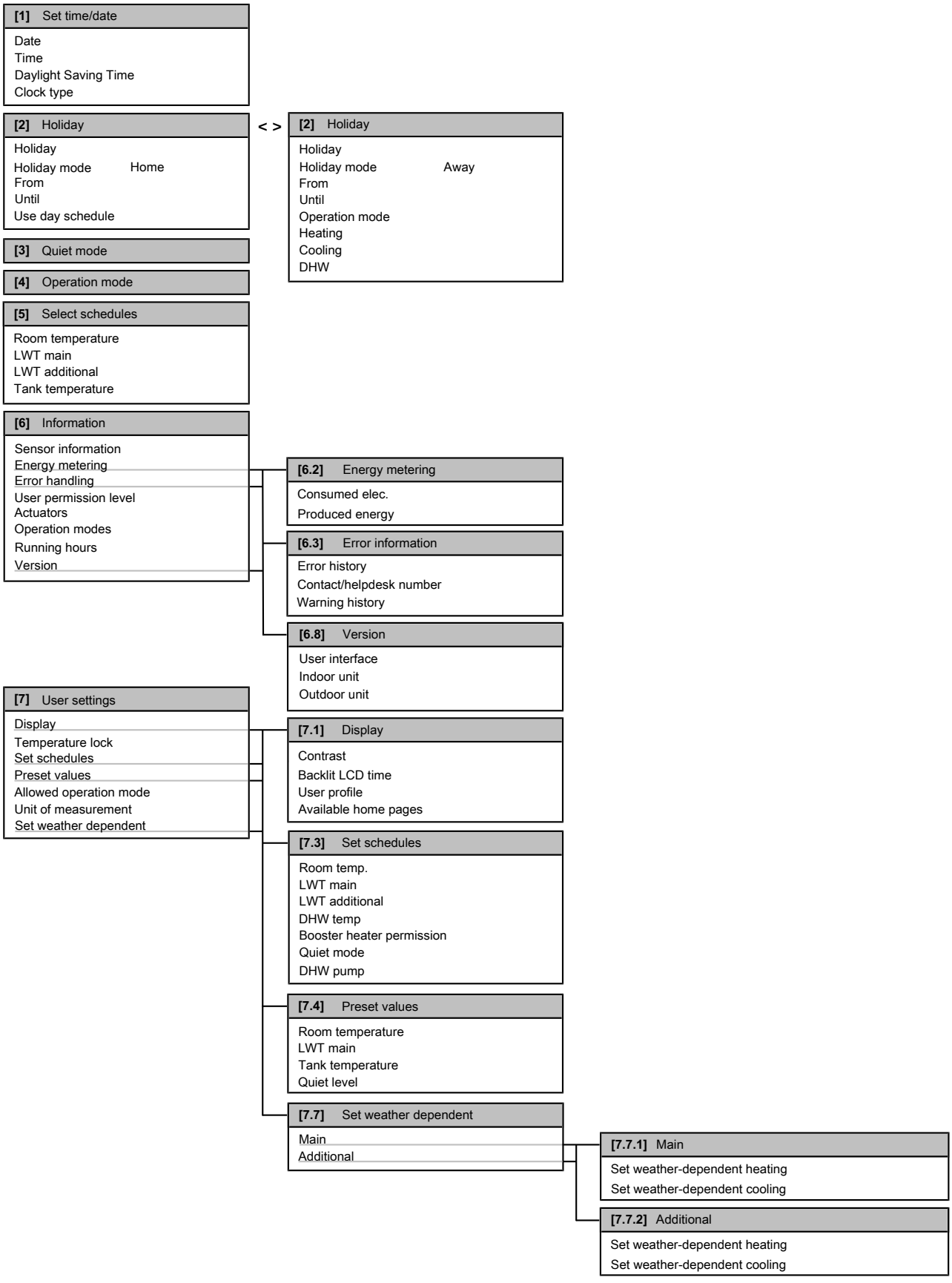


[9-0D]=8



a External static pressure
b Water flow rate

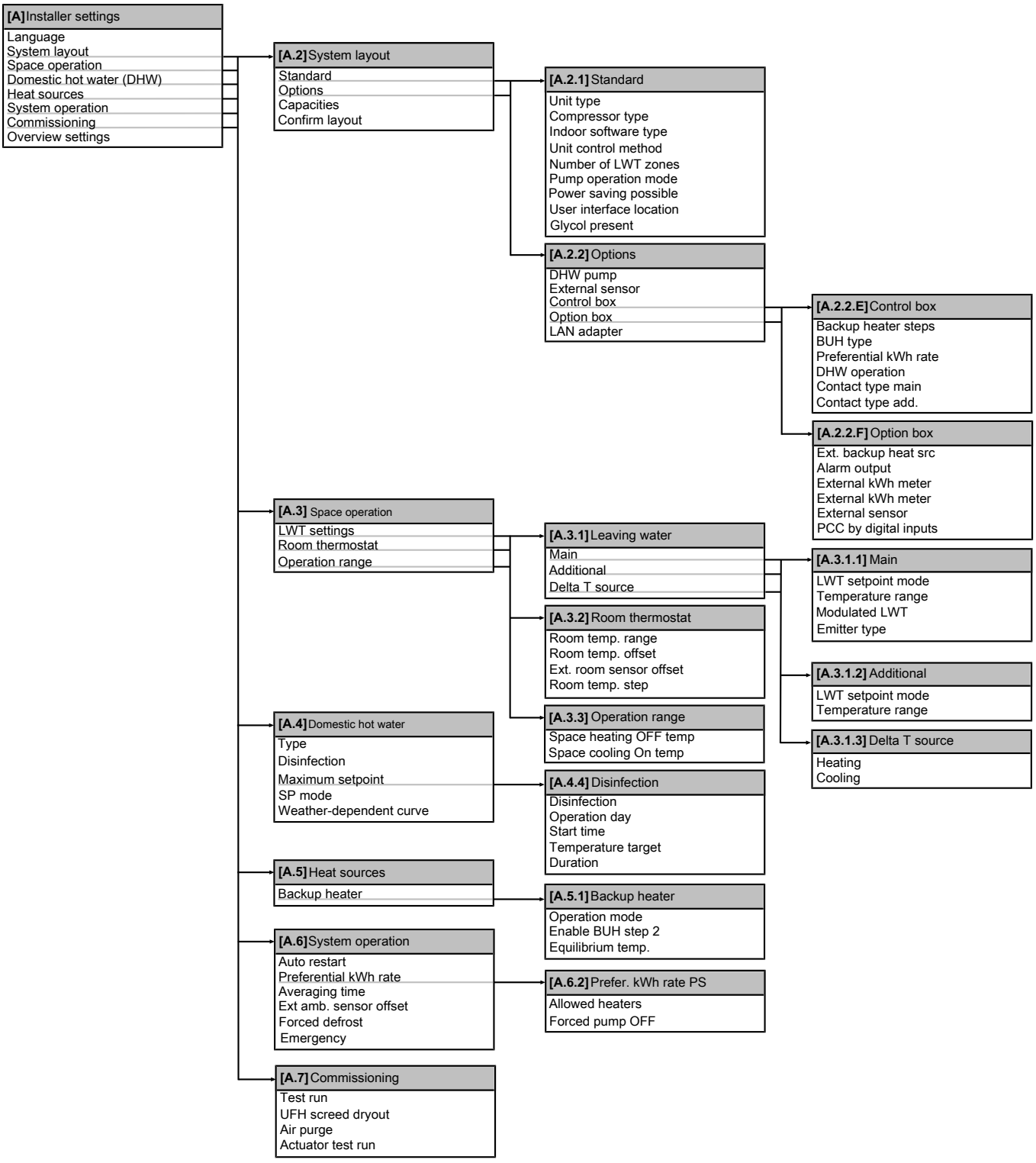
8.4 Menu structure: Overview user settings



INFORMATION

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

8.5 Menu structure: Overview installer settings



INFORMATION

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

9 Commissioning

9.1 Overview: Commissioning

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

Typical workflow

Commissioning typically consists of the following stages:

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

9.2 Precautions when commissioning

INFORMATION

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

NOTICE

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

9.3 Checklist before commissioning

Do NOT operate the system before the following checks are OK. Depending on the system layout, not all components may be available.

☐	You read the complete installation instructions, as described in the **installer reference guide**.
☐	The **outdoor unit** is properly mounted.
☐	The **control box** is properly mounted.
☐	The **option box** is properly mounted.
☐	Only if you use the optional backup heater: The **backup heater** is properly mounted.
☐	The following **field wiring** has been carried out according to the available documentation and the applicable legislation: ▪ Between the local supply panel and the outdoor unit ▪ Between the outdoor unit and the control box ▪ Between the control box and the option box ▪ Between the control box and the backup heater ▪ Between the local supply panel and the control box ▪ Between the local supply panel and the option box ▪ Between the outdoor unit and the valves ▪ Between the control box and the room thermostat ▪ Between the control box and the domestic hot water tank
☐	The system is properly **earthed** and the earth terminals are tightened.
☐	The **fuses** or locally installed protection devices are installed according to this document, and have NOT been bypassed.
☐	The **power supply voltage** matches the voltage on the identification label of the unit.
☐	There are NO **loose connections** or damaged electrical components in the switch box.
☐	There are NO **damaged components** or **squeezed pipes** on the inside of the outdoor unit.
☐	Only if you use the optional backup heater: Depending on the backup heater type, **backup heater circuit breaker** F1B (on the switch box of the backup heater) is turned ON.
☐	Only for tanks with built-in booster heater: **Booster heater circuit breaker** F2B (on the switch box of the control box) is turned ON.
☐	The correct pipe size is installed and the **pipes** are properly insulated.
☐	There are no **water leaks** inside the outdoor unit.
☐	The **shut-off valves** are properly installed and fully open.
☐	The **pressure relief valve** purges water when opened.
☐	The **minimum water volume** is guaranteed in all conditions. See "To check the water volume" in "6.3 Preparing water piping" on page 26.
☐	If **glycol** was added to the system, confirm the correct glycol concentration, and check if glycol setting [E-0D]=1.

NOTICE

- Make sure glycol setting [E-0D] matches the liquid inside the water circuit (0=water only, 1=water+glycol). If the glycol setting is NOT set correctly, the liquid inside the piping can freeze.
- When glycol is added to the system, but the glycol concentration is lower than prescribed, the liquid inside the piping can still freeze.

INFORMATION

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

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

9.4 Checklist during commissioning

☐	The **minimum flow rate** is guaranteed in all conditions. See "To check the water volume and flow rate" in "6.3 Preparing water piping" on page 26.
☐	To perform an **air purge**.
☐	To perform a **test run**.
☐	To perform an **actuator test run**.
☐	**Underfloor screed dryout function** The underfloor screed dryout function is started (if necessary).

9.4.1 To check the minimum flow rate

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

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

3 Start the pump test run operation (see "9.4.4 To perform an actuator test run" on page 79).

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

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

9.4.2 Air purge function

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

NOTICE

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

There are 2 modes for purging air:

- Manual: the unit operates 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 more than helpful feature to remove all air from the water circuit in the space heating or the domestic hot water heating mode. Air purge must be performed for both the space heating and the domestic hot water circuit. The operation speed of the pump (slow or quick) can also be set.
- Automatic: the unit automatically changes the pump speed and switches the position of the 3-way valve between the space heating and the domestic hot water heating mode.

Typical workflow

Purging the air from the system should consist of:

1 Performing a manual air purge

2 Performing an automatic air purge

NOTICE

The outdoor unit is equipped with a manual air purge valve. The air purge procedure requires manual action.

NOTICE

When purging air with the manual air purge valve of the unit, collect any fluid that might leak out of the valve. If this fluid is NOT collected, it might drip on internal components and damage the unit.

INFORMATION

- To purge air, use all air purge valves present in the system. This includes the manual air purge valve of the outdoor unit, as well as any field-supplied valves.
- If the system contains a backup heater, also use the air purge valve of the backup heater.
- If the system contains valve kit EKMBHBP1, it is required to – during the air purge – manually switch the position of the valve kit's 3-way valve by turning its knob, this to prevent air from remaining in the bypass. For more information, refer to the instruction sheet of the valve kit.

INFORMATION

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

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

The air purge function automatically stops after 30 minutes.

To perform a manual air purge

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

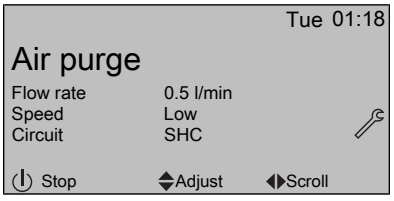
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 51.

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

3 Select Manual and press OK.

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

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



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

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

Result: Low

Result: High

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

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

Result: SHC or Tank

To perform an automatic air purge

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

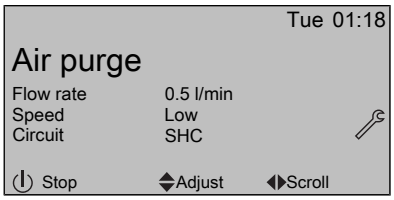
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 51.

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

3 Select Automatic and press OK.

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

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



INFORMATION

If the temperature of the water circuit is low, and glycol was added to it, then the flow rate will NOT be displayed.

To interrupt air purge

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

9.4.3 To perform a test run

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

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 51.

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

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

4 Select OK and press OK.

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

INFORMATION

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

INFORMATION

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

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

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

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

9.4.4 To perform an actuator test run

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

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

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 51.

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

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

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

5 Select OK and press OK.

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

Possible actuator test runs

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

INFORMATION

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

- 2-way valve test
- 3-way valve test
- Bivalent signal test
- Alarm output test
- Cooling/heating signal test
- Quick heat-up test
- Circulation pump test

9.4.5 Underfloor heating screed dryout

This function is used for drying out the screed of an underfloor heating system very slowly during the construction of a house. It allows the installer to program and execute this program.

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

If a backup heater kit is part of the system, this function can be executed without finishing the outdoor installation. In this case, the backup heater will perform the screed dryout and supply the leaving water without heat pump operation.

INFORMATION

- If Emergency is set to Manual ([A.6.C]=0), and the unit is triggered to start emergency operation, the user interface will ask confirmation before starting. The underfloor heating screed dryout function is active even if the user does NOT confirm emergency operation.
- During underfloor heating screed dryout, pump speed limitation [9-0D] is NOT applicable.

NOTICE

The installer is responsible for:

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

NOTICE

To perform an underfloor heating screed dryout, room frost protection needs to be disabled ([2-06]=0). By default, it is enabled ([2-06]=1). However, due to the "installer-on-site" mode (see "Checklist before commissioning"), room frost protection will be automatically disabled for 36 hours after the first power-on.

If the screed dryout still needs to be performed after the first 36 hours of power-on, manually disable room frost protection by setting [2-06] to "0", and KEEP it disabled until the screed dryout has finished. Ignoring this notice will result in cracking of the screed.

NOTICE

For the underfloor heating screed dryout to be able to start, make sure the following settings are met:

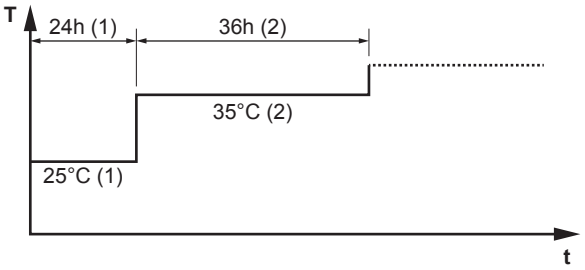
- [4-00]=1
- [C-02]=0
- [D-01]=0
- [4-08]=0
- [4-01]≠1

The installer can program up to 20 steps. For each step he needs to enter:

1 the duration in hours, up to 72 hours,

2 the desired leaving water temperature.

Example:



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

To program an underfloor heating screed dryout schedule

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 51.

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

3 Use the , , , and to program the schedule.

- Use and to scroll through the schedule.
- Use and to adjust the selection.
  If a time is selected, you can set the duration between 1 and 72 hours.
  If a temperature is selected, you can set the desired leaving water temperature between 15°C and 55°C.

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

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

6 Press OK to save the schedule.

It is important that there is no empty step in the program. The schedule will stop when a blank step is programmed OR when 20 consecutive steps have been executed.

To perform an underfloor heating screed dryout

INFORMATION

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

Prerequisite: Make sure there is ONLY 1 user interface connected to your system to perform an underfloor heating screed dryout.

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

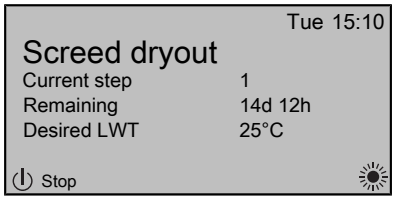
1 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout.

2 Set a dryout program.

3 Select Start dryout and press OK.

4 Select OK and press OK.

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



To readout the status of an underfloor heating screed dryout

1 Press .

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

INFORMATION

There is limited access to the menu structure. Only the following menus can be accessed:

- Information.
- Installer settings > Commissioning > UFH screed dryout.

To interrupt an underfloor heating screed dryout

When the program is stopped by an error, an operation switch off, or a power failure, the U3 error will be displayed on the user interface. To resolve the error codes, see "12.4 Solving problems based on error codes" on page 85. To reset the U3 error, your User permission level needs to be Installer.

1 Go to the underfloor heating screed dryout screen.

2 Press .

3 Press to interrupt the program.

4 Select OK and press OK.

Result: The underfloor heating screed dryout program is stopped.

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

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

6 Modify and restart the execution of the program.

10 Hand-over to the user

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

- Fill in the installer setting table (in the operation manual) with the actual settings.
- Make sure that the user has the printed documentation and ask him/her to keep it for future reference. Inform the user that he can find the complete documentation on the url as earlier described in this manual.
- Explain the user how to properly operate the system and what to do in case of problems.
- Show the user what to do in relation to maintaining the unit.
- Explain the user about energy saving tips as described in the operation manual.

10.1 About locking and unlocking

If required, it is possible to lock the buttons of the main user interface, making it impossible for the user to operate it. For the user to be able to change setpoint temperatures, the simplified user interface or an external room thermostat is then required.

You can use the following locking modes:

- Function lock: Locks a specific function to prevent people from changing its settings.
- Button lock: Locks all buttons to prevent users from changing settings.

Possible function locks

Lock	If active, people cannot…
Room On/OFF	Turn ON or OFF the room temperature control.
LWT On/OFF	Turn ON or OFF the leaving water temperature (main + additional) control.
Tank On/OFF	Turn ON or OFF the domestic hot water control.
Temperature up/down	Adjust temperatures.
Quiet mode	Use quiet mode.
Holiday	Use holiday mode.
Operation mode	Set the space operation mode.
User settings	Change settings in [7]: ☰ > User settings.

To check if locking is active

1 Press ⌂ to go to one of the home pages.

2 If 🔒 is displayed, button lock is active.

Note: If you are on a home page and try to use a function that is locked, 🔒 is displayed for 1 second.

To activate or deactivate a function lock

1 Press ☰ to go to the menu structure.

2 Press OK for more than 5 seconds.

3 Select a function and press OK.

4 Select Lock or Unlock, and press OK.

To activate or deactivate button lock

1 Press ⌂ to go to one of the home pages.

2 Press OK for more than 5 seconds.

11 Maintenance and service

NOTICE

Maintenance MUST be done by an authorized installer or service agent.

We recommend performing maintenance at least once a year. However, applicable legislation might require shorter maintenance intervals.

NOTICE

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

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

11.1 Overview: Maintenance and service

This chapter contains information about:

- The yearly maintenance of the outdoor unit
- The inspection of the backup heater switch box.
- The inspection of the control box switch box.

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 outdoor unit

See "7.2.2 To open the outdoor unit" on page 32 and "7.2.3 To open the switch box cover of the outdoor unit" on page 32.

11.2.2 Opening the control box

See "7.2.4 To open the control box" on page 32.

11.2.3 Opening the option box

See "7.2.5 To open the option box" on page 32.

11.2.4 Opening the backup heater

See "7.2.6 To open the backup heater" on page 33 and "7.2.7 To open the switch box cover of the backup heater" on page 33.

11.3 Checklist for yearly maintenance of the outdoor unit

Check the following at least once a year:

- Heat exchanger
- 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

Heat exchanger

The heat exchanger of the outdoor unit can get blocked up due to dust, dirt, leaves, etc. It is recommended to clean the heat exchanger yearly. A blocked heat exchanger can lead to too low pressure or too high pressure leading to worse performance.

Water pressure

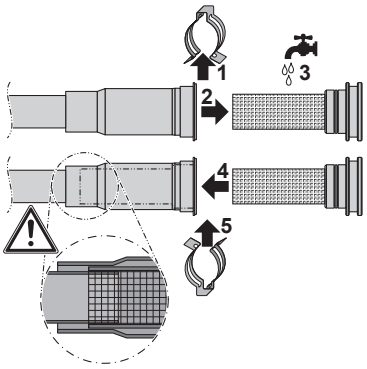
Check whether the water pressure is above 1 bar. If it is lower, add water.

Water filter

Clean the water filter.

NOTICE

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



Water pressure relief valve

Open the valve and check if it operates correctly. **The water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does NOT contain dirt anymore
  - flush the system and install an additional water filter (a magnetic cyclone filter is preferable).

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

Relief valve of the domestic hot water tank (field supply)

Open the valve and check the correct operation. **Water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does not contain dirt anymore
  - flush and clean the complete tank, including the piping between the relief valve and cold water inlet.

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

Switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring. If applicable, also inspect the switch box of the control box, option box, and backup heater.
- Using an ohmmeter, check if contactors K1M, K2M, and K5M in the switch box of the backup heater, and K3M in the switch box of the control box (depending on your installation) operate correctly. All contacts of these contactors must be in open position when the power is turned OFF.

WARNING

If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

12 Troubleshooting

12.1 Overview: Troubleshooting

This chapter describes what you have to do in case of problems.

It contains information about:

- Solving problems based on symptoms
- Solving problems based on error codes

Before troubleshooting

Carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

12.2 Precautions when troubleshooting

WARNING

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

DANGER: RISK OF ELECTROCUTION

WARNING

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

DANGER: RISK OF BURNING

12.3 Solving problems based on symptoms

12.3.1 Symptom: The unit is NOT heating 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	Check and make sure that: ▪ All shut-off valves of the water circuit are completely open. ▪ The water filter is clean. Clean if necessary. ▪ There is no air in the system. Purge air if necessary. You can purge air manually (see "To perform a manual air purge" on page 78) or use the automatic air purge function (see "To perform an automatic air purge" on page 78). ▪ The water pressure is >1 bar. ▪ The expansion vessel is NOT broken. ▪ The resistance in the water circuit is NOT too high for the pump (see the ESP curve in the "Technical data" chapter). If the problem persists after you have conducted all of the above checks, contact your dealer. In some cases, it is normal that the unit decides to use a low water flow.
The water volume in the installation is too low	Make sure that the water volume in the installation is above the minimum required value (see "6.3.3 To check the water volume and flow rate" on page 27).

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

Possible causes	Corrective action
The unit must start up out of its operation range (the water temperature is too low)	**If the system contains a backup heater:** If the water temperature is too low, the unit uses the backup heater to reach the minimum water temperature first (15°C). Check and make sure that: ▪ The power supply to the backup heater is correctly wired. ▪ The backup heater thermal protector is NOT activated. ▪ The backup heater contactors are NOT broken. **If the system does NOT contain a backup heater**: It may be required to start up with a small water volume. To do this, gradually open the heat emitters. As a result, the water temperature will gradually rise. Monitor the inlet water temperature ([6.1.6] in the menu structure) and make sure it does NOT drop below 25°C. If the problem persists after you have conducted all of the above checks, contact your dealer.
The preferential kWh rate power supply settings and electrical connections do NOT match	This should match with the connections as explained in "6.4 Preparing electrical wiring" on page 29 and "7.8.5 To connect the main power supply" on page 41.
The preferential kWh rate signal was sent by the electricity company	Wait for the power to return (2 hours max.).

12.3.3 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see "To perform a manual air purge" on page 78) or use the automatic air purge function (see "To perform an automatic air purge" on page 78).
The water pressure at the pump inlet is too low	Check and make sure that: ▪ The water pressure is >1 bar. ▪ The manometer is not broken. ▪ The expansion vessel is NOT broken. ▪ The pre-pressure setting of the expansion vessel is correct (see "6.3.4 Changing the pre-pressure of the expansion vessel" on page 29).

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 and flow rate" on page 27 and "6.3.4 Changing the pre-pressure of the expansion vessel" on page 29).
The water circuit head is too high	The water circuit head is the difference in height between the outdoor unit and the highest point of the water circuit. If the outdoor unit is located at the highest point of the installation, the installation height is considered 0 m. The maximum water circuit head is 10 m. Check the installation requirements.

12.3.5 Symptom: The water pressure relief valve leaks

Possible causes	Corrective action
Dirt is blocking the water pressure relief valve outlet	Check whether the pressure relief valve works correctly by turning the red knob on the valve counterclockwise: ▪ If you do NOT hear a clacking sound, contact your dealer. ▪ If the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your dealer.

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

Possible causes	Corrective action

If the system contains a backup heater: backup heater operation is not activated	Check and make sure that:
	▪ The backup heater operation mode is enabled. Go to:
	  ▪ [A.5.1.1] > Installer settings > Heat sources > Backup heater > Operation mode [4-00]
	▪ The backup heater overcurrent fuse has not been turned off. If it has, check the fuse and turn it back on.
	▪ The thermal protector of the backup heater has not been activated. If it has, check the following, and then press the reset button in the switch box:
	  ▪ The water pressure
	  ▪ Whether there is air in the system
	  ▪ The air purge operation

If the system contains a backup heater: the backup heater equilibrium temperature has not been configured correctly	Increase the "equilibrium temperature" to activate the backup heater operation at a higher outdoor temperature. Go to: ▪ [A.5.1.4] > Installer settings > Heat sources > Backup heater > Equilibrium temp. OR ▪ [A.8] > Installer settings > Overview settings [5-01]
There is air in the system.	Purge air manually or automatically. See the air purge function in the "Commissioning" chapter.
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank)	Check and make sure that the "space heating priority" settings have been configured appropriately: ▪ Make sure that the "space heating priority status" has been enabled. Go to [A.8] > Installer settings > Overview settings [5-02] ▪ Increase the "space heating priority temperature" to activate backup heater operation at a higher outdoor temperature. Go to [A.8] > Installer settings > Overview settings [5-03]

12.3.7 Symptom: The pressure at the tapping point is temporarily unusually high

Possible causes	Corrective action
Failing or blocked pressure relief valve.	▪ Flush and clean the complete tank including the piping between pressure relief valve and the cold water inlet. ▪ Replace the pressure relief valve.

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

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

12.3.9 Symptom: Tank disinfection function is NOT completed correctly (AH-error)

Possible causes	Corrective action
The disinfection function was interrupted by domestic hot water tapping	Program the start-up of the disinfection function when the coming 4 hours NO domestic hot water tapping is expected.

Possible causes	Corrective action
Large domestic hot water tapping happened recently before the programmed start-up of the disinfection function	When the Domestic hot water > Type > Reheat or Reheat + sched. is selected, it is recommended to program the start-up the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set by installer settings (disinfection function). When the Domestic hot water > Type > Scheduled only is selected, it is recommended to program a Storage eco 3 hours before the scheduled start-up of the disinfection function to preheat the tank.
The disinfection operation was stopped manually: with the user interface displaying the DHW home page and its user permission level set to Installer, the ⏻ button was pressed during disinfection operation.	Do NOT press the ⏻ button while the disinfection function is active.

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

Possible causes	Corrective action
The measured temperatures for produced heat calculation are NOT accurate.	Execute a calibration of the system by performing an actuator test run of the pump (see "9.4.4 To perform an actuator test run" on page 79).

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 measures before resetting an 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 To display the help text in case of a malfunction

In case of a malfunction, the following will appear on the home screen depending on the severity:

- 🔔: Error
- ⚠: Malfunction

You can get a short and a long description of the malfunction as follows:

1	Press the left dial to open the main menu and go to Malfunctioning. **Result:** A short description of the error and the error code is displayed on the screen.	
2	Press **?** in the error screen. **Result:** A long description of the error is displayed on the screen.	**?**

12.4.2 Error codes: Overview

Error codes of the outdoor unit

Refrigerant part

Error code	Detailed error code	Description
A5	00	OU: High pressure cooling/Peak cut/ freeze protection problem. Please contact your dealer.
E1	00	OU: PCB defect. Power reset required. Please contact your dealer.
E3	00	OU: Actuation of high pressure switch (HPS). Please contact your dealer.
E5	00	OU: Overheat of inverter compressor motor. Please contact your dealer.
E6	00	OU: Compressor startup defect. Please contact your dealer.
E7	00	OU: Malfunction of outdoor unit fan motor. Please contact your dealer.
E8	00	OU: Power input overvoltage. Please contact your dealer.
EA	00	OU: Cool/heat switchover problem. Please contact your dealer.
H0	00	OU: Voltage/current sensor problem. Please contact your dealer.
H3	00	OU: Malfunction of high pressure switch (HPS) Please contact your dealer.
H6	00	OU: Malfunction of position detection sensor. Please contact your dealer.
H8	00	OU: Malfunction of compressor input (CT) system. Please contact your dealer.
H9	00	OU: Malfunction of outdoor air thermistor. Please contact your dealer.
F3	00	OU: Malfunction of discharge pipe temperature. Please contact your dealer.
F6	00	OU: Abnormal high pressure in cooling. Please contact your dealer.

Error code	Detailed error code	Description
FA	00	OU: Abnormal high pressure, actuation of HPS. Please contact your dealer.
JA	00	OU: Malfunction of high pressure sensor. Please contact your dealer.
J3	00	OU: Malfunction of discharge pipe thermistor. Please contact your dealer.
J6	00	OU: Malfunction of heat exchanger thermistor. Please contact your dealer.
L3	00	OU: Electrical box temperature rise problem. Please contact your dealer.
L4	00	OU: Malfunction of inverter radiating fin temperature rise. Please contact your dealer.
L5	00	OU: Inverter instantaneous overcurrent (DC). Please contact your dealer.
P4	00	OU: Malfunction of radiating fin temperature sensor. Please contact your dealer.
U0	00	OU: Shortage of refrigerant. Please contact your dealer.
U2	00	OU: Defect of power supply voltage. Please contact your dealer.
U7	00	OU: Transmission malfunction between main CPU- INV CPU. Please contact your dealer.
UA	00	OU: Indoor/outdoor combination problem. Power reset required.

Hydro part

Error code	Detailed error code	Description
7H	01	Water flow problem. Auto restart.
7H	04	Water flow problem during domestic hot water production. Manual reset. Check the domestic hot water circuit.
7H	05	Water flow problem during heating/sampling. Manual reset. Check the space heating/cooling circuit.
7H	06	Water flow problem during cooling/defrost. Manual reset. Check the plate heat exchanger.
80	00	Returning water temperature sensor problem. Please contact your dealer.
81	00	Leaving water temperature sensor problem. Please contact your dealer.
89	01	Heat exchanger frozen.
89	02	Heat exchanger frozen.
89	03	Heat exchanger frozen.
8F	00	Abnormal increase outlet water temperature (DHW).
8H	00	Abnormal increase outlet water temperature.
A1	00	Zero cross detection problem. Power reset required. Please contact your dealer.
A1	01	EEPROM reading error.
A1	00	EEPROM reading error.
AA	01	Backup heater overheated. Power reset required. Please contact your dealer.
AC	00	Booster heater overheated. Please contact your dealer.
AH	00	Tank disinfection function not completed correctly.
AJ	03	Too long DHW heat-up time required.
C0	00	Flow sensor malfunction. Manual reset.
C0	01	Flow switch malfunction. Auto reset.

Error code	Detailed error code	Description
C0	02	Flow switch malfunction. Manual reset.
C4	00	Heat exchanger temperature sensor problem. Please contact your dealer.
CJ	02	Room temperature sensor problem. Please contact your dealer.
EC	00	Abnormal increase tank temperature.
EC	04	Tank preheating
H1	00	External temperature sensor problem. Please contact your dealer.
HC	00	Tank temperature sensor problem. Please contact your dealer.
U3	00	Under floor heating screed dryout function not completed correctly.
U4	00	Hydro part / refrigerant part communication problem
U5	00	User interface communication problem.
U8	01	Connection with adapter lost Please contact your dealer.
UA	00	Hydro part / refrigerant part matching problem. Power reset required.
UA	16	Communication problem between hydro part and control box.
UA	22	Communication problem between control box and option box.

INFORMATION

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

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

NOTICE

When the minimum water flow is lower than described in the table below, the unit will temporarily stop operation and the user interface will display error 7H-01. After some time, this error will reset automatically and the unit will resume operation.

If the 7H-01 error persists, the unit will stop operation and the user interface will display an error code that needs to be reset manually. Depending on the problem, this error code is different:

Error code	Detailed error code	Description
7H	04	The water flow problems mainly occurred during domestic hot water operation. Check the domestic hot water circuit.
7H	05	The water flow problems mainly occurred during space heating operation. Check the space heating circuit.
7H	06	The water flow problems mainly occurred during cooling/defrost operation. Check the space heating/cooling circuit. Additionally, this error code might be an indication of frost damage to the plate heat exchanger. In that case, contact your local dealer.

INFORMATION

Error AJ-03 is reset automatically from the moment there is a normal tank heat-up.

INFORMATION

Error EC-04 is reset automatically from the moment the domestic hot water tank is preheated to a sufficiently high temperature.

INFORMATION

If the unit detects flow when the pump is not running, an external device might be causing flow, or there might be something wrong with the flow measuring devices (flow sensor and flow switch).

- If the flow sensor detects flow when the pump is not running, the unit will stop operation and the user interface will display error C0-00. For the unit to resume operation, this error needs to be reset manually.
- If the flow switch detects flow when the pump is not running, the unit will temporarily stop operation and the user interface will display error C0-01. After some time, the error will reset automatically and the unit will resume operation. If the problem persists, the unit will stop operation and the user interface will display error C0-02. For the unit to resume operation, this error needs to be reset manually.

Error codes of the indoor unit

INFORMATION

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

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

INFORMATION

If the booster heater overheats and is disabled by the thermostatic safety, the unit will not give an error directly. Check if the booster heater is still in operation if you experience one or more of the following errors:

- Powerful operation takes a very long time to heat up and the error code AJ-03 is displayed.
- During anti-legionella operation (weekly), the error code AH-00 is displayed because the unit cannot reach the requested temperature required for tank disinfection.

INFORMATION

A malfunctioning booster heater will have an impact on energy metering and power consumption control.

NOTICE

When the minimum water flow is lower than described in the table below, the unit will temporarily stop operation and the user interface will display error 7H-01. After some time, this error will reset automatically and the unit will resume operation.

If the 7H-01 error persists, the unit will stop operation and the user interface will display an error code that needs to be reset manually. Depending on the problem, this error code is different:

Error code	Detailed error code	Description
7H	04	The water flow problems mainly occurred during domestic hot water operation. Check the domestic hot water circuit.
7H	05	The water flow problems mainly occurred during space heating operation. Check the space heating circuit.
7H	06	The water flow problems mainly occurred during cooling/defrost operation. Check the space heating/cooling circuit. Additionally, this error code might be an indication of frost damage to the plate heat exchanger. In that case, contact your local dealer.

INFORMATION

Error AJ-03 is reset automatically from the moment there is a normal tank heat-up.

INFORMATION

Error EC-04 is reset automatically from the moment the domestic hot water tank is preheated to a sufficiently high temperature.

13 Disposal

NOTICE

Do NOT try to dismantle the system yourself: dismantling of the system, treatment of the refrigerant, oil and other parts MUST comply with applicable legislation. Units MUST be treated at a specialised treatment facility for reuse, recycling and recovery.

13.1 Overview: Disposal

Typical workflow

Disposing of the system typically consists of the following stages:

1 Pumping down the system.

2 Bringing the system to a specialized treatment facility.

INFORMATION

For more details, see the service manual.

13.2 To pump down

Example: To protect the environment, pump down when disposing of the unit.

It is NOT required to pump down when relocating the unit.

DANGER: RISK OF EXPLOSION

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

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

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 breakdown or damage to the system can result due to abnormal pressure in the refrigerant cycle.

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

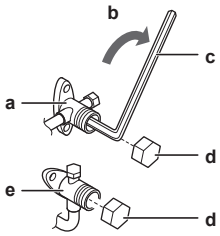
1 Remove the valve cap from the liquid stop valve and the gas stop valve.

2 Carry out forced cooling. See "13.3 To start and stop forced cooling" on page 89.

3 After 5 to 10 minutes (after only 1 or 2 minutes in case of very low ambient temperatures (<−10°C)), close the liquid stop valve with a hexagonal wrench.

4 Check on the manifold if the vacuum is reached.

5 After 2-3 minutes, close the gas stop valve and stop forced cooling.

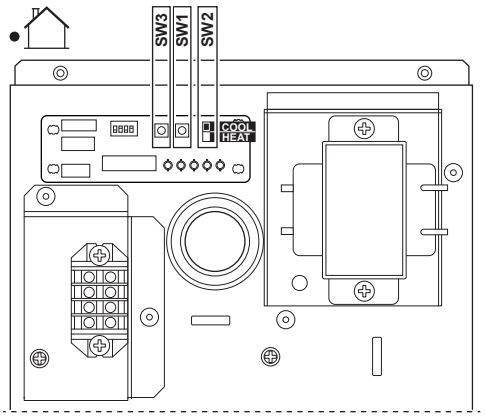


a Gas stop valve
b Closing direction
c Hexagonal wrench
d Valve cap
e Liquid stop valve

13.3 To start and stop forced cooling

Confirm that DIP switch SW2 is in COOL mode.

1. Press the forced cooling operation switch SW1 to begin forced cooling.
2. Press the forced cooling operation switch SW1 to stop forced cooling.



NOTICE

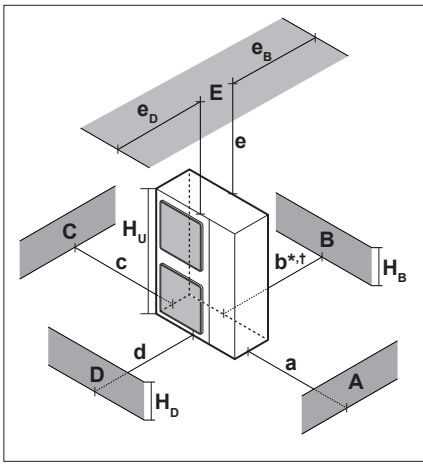
Take care that while running forced cooling operation, the water temperature remains higher than 5°C (see temperature read out of the indoor unit). You can achieve this, for example, by activating all fans of the fan coil units.

14 Technical data

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

14.1 Service space: Outdoor unit

Single unit



A~E	H_B H_D H_U	(mm)								
		a	b*	b†	c	d	e	e_B	e_D	H
A, B, C	—	≥500	≥250	≥400	≥100					≥150
A, B, C, E	—	≥500	≥250	≥400	≥150		≥1000		≤500	≥150
D	—					≥500				≥150
D, E	—					≥500	≥1000	≤500		≥150
B, D	$H_D<H_U$		≥250	≥400		≥500				≥150
B, D, E	$H_D<H_U$ & $H_B>H_U$		≥250	≥400		≥1000	≥1000		≤500	≥150
	$H_D>H_U$ & $H_B<H_U$		≥250	≥400		≥1000	≥1000	≤500		≥150

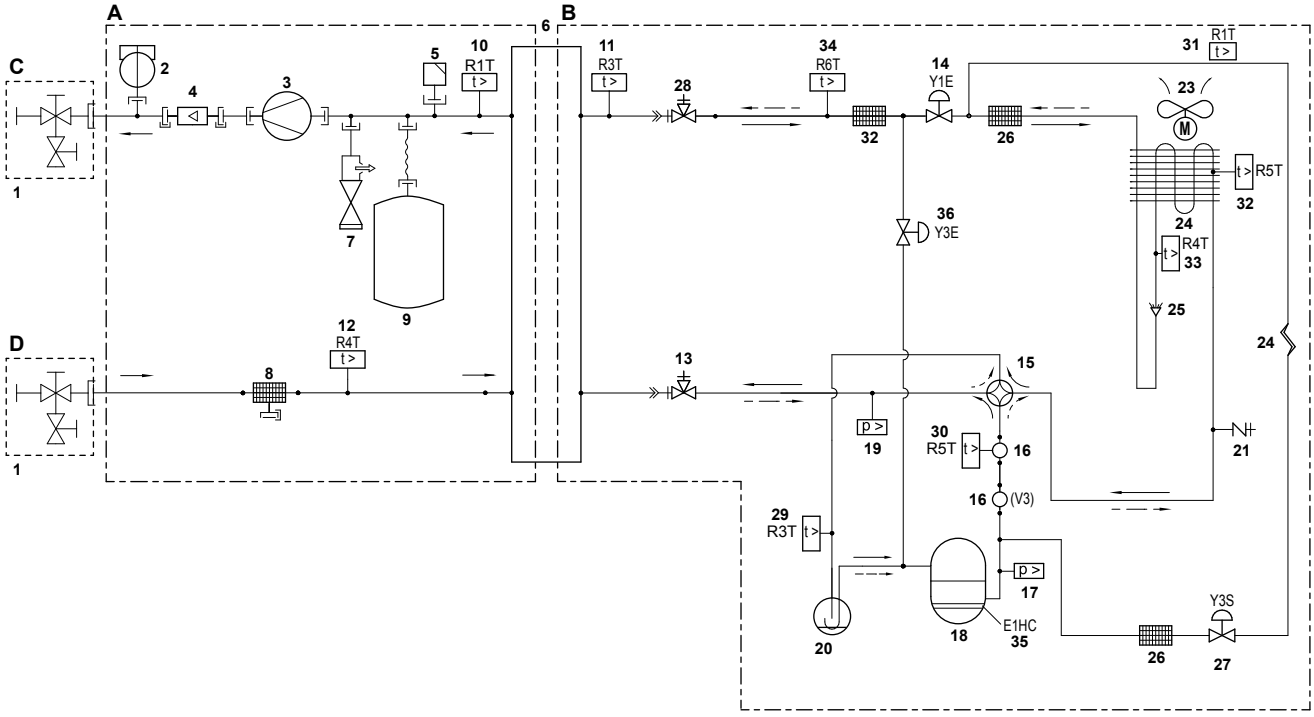
*,† ➡

A,C Left side and right side obstacles (walls/baffle plates)
B Suction side obstacle (wall/baffle plate)
D Discharge side obstacle (wall/baffle plate)
E Top side obstacle (roof)
a,b,c,d,e Minimum service space between the unit and obstacles A, B, C, D and E
***** If shut-off valves are NOT installed on the unit
† If shut-off valves are installed on the unit
e_B Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle B
e_D Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle D
H_U Height of the unit including the installation structure
H_B,H_D Height of obstacles B and D
H Height of installation structure below the unit

INFORMATION

If shut-off valves are installed on the unit, provide a minimum space of 400 mm at the air inlet side. If shut-off valves are NOT installed on the unit, provide a minimum space of 250 mm.

14.2 Piping diagram: Outdoor unit



1 Shut-off valve with drain/fill valve
2 Flow switch
3 Pump
4 Flow sensor
5 Air purge
6 Plate heat exchanger
7 Safety valve
8 Water filter
9 Expansion vessel
10 Outlet water heat exchanger thermistor
11 Refrigerant liquid side thermistor
12 Inlet water thermistor
13 Gas stop valve with service port
14 Electronic expansion valve (main)
15 4-way valve
16 Muffler (lower muffler on diagram: only for V3)
17 High pressure switch
18 Compressor
19 Pressure sensor
20 Accumulator
21 Service port 5/16" flare
22 Heat exchanger
23 Fan motor (propeller fan)
24 Capillary tube
25 Distributor
26 Refrigerant filter
27 Solenoid valve
28 Liquid stop valve with service port
29 Suction pipe thermistor
30 Discharge pipe thermistor
31 Outdoor air temperature thermistor
32 Heat exchanger thermistor (middle)
33 Heat exchanger thermistor (distributor)
34 Liquid pipe thermistor
35 Crankcase heater
36 Electronic expansion valve (injection)
A Water side
B Refrigerant side
C Outlet
D Inlet
Field installed
Refrigerant flow - cooling
Refrigerant flow – heating

14.3 Wiring diagram: Outdoor unit

See the internal wiring diagram supplied with the unit (on the inside of the front plate). The abbreviations used are listed below.

(1) Connection diagram

English	Translation
Connection diagram	Connection diagram
Outdoor	Outdoor
ON	ON
OFF	OFF
See note ***	See note ***
Upper Fan	Upper fan
Lower Fan	Lower fan
Injection	Injection
Main	Main

(2) Layout

English	Translation
Front	Front
Position of compressor terminal	Position of compressor terminal

(3) Notes

English	Translation
Notes	Notes
	Connection
X1M	Main terminal
	Earth wiring
	Field supply
	Option
	Switch box
	PCB
	Wiring depending on model

English	Translation
⏚	Protective earth
	Field wire

NOTES:

1 Refer to the wiring diagram sticker (on the back of the service cover) for how to use the BS1~BS4 and DS1 switches.

2 When operating, do not short-circuit protective devices S1PH, S1PL and S1NPH

3 Refer to the combination table and the option manual for how to connect the wiring to X6A.

4 Colours: BLK: black; RED: red; BLU: blue; WHT: white; GRN: green; YLW: yellow

5 Confirm the method of setting the selector switches (DS1) by service manual. Factory setting of all switches: OFF.

(4) Legend

A1P		Printed circuit board (main)
A2P (V3 only)		Printed circuit board (service)
A2P (W1 only)		Printed circuit board (inverter)
A3P		Printed circuit board (noise filter)
A4P (V3 only)		Printed circuit board (communication)
BS1~BS4 (A2P)		Push-button switch
C1~C4 (A1P)(V3 only)		Capacitor
C1~C3 (A2P)(W1 only)		Capacitor
DS1 (A2P)		DIP switch
E1H	*	Bottom plate heater
E1HC		Crankcase heater
F1U, F3U, F4U (A1P~A4P) (V3 only)		Fuse T 6.3 A 250 V
F6U (A1P) (V3 only)		Fuse T 5 A 250 V
F7U, F8U (V3 only)	*	Fuse F 1 A 250 V
F1U, F2U (A1P) (W1 only)		Fuse T 31.5 A 500 V
F3U~F6U (A1P) (W1 only)		Fuse T 6.3 A 500 V
F7U (A2P) (W1 only)		Fuse T 5 A 250 V
F8U, F9U (W1 only)	*	Fuse F 1 A 250 V
H1P~H7P (A2P)		LED (service monitor is orange)
HAP (A1P)(V3 only)		LED (service monitor is green)
HAP (A1P~A2P) (W1 only)		LED (service monitor is green)
K1M~K2M (A2P) (W1 only)		Magnetic contactor (main-upload)
K1R (A1P)		Magnetic relay (Y1S)
K1R (A2P)(W1 only)		Magnetic relay (upload)
K2R (A1P)(V3 only)		Magnetic relay (Y3S)
K3R (A1P)(V3 only)		Magnetic relay (E1H)
K2R (A1P)(W1 only)		Magnetic relay (E1H)
K3R (A1P)(W1 only)		Magnetic relay (Y3S)
K4R (A1P)		Magnetic relay (E1HC)
K10R (A1P)(V3 only)		Magnetic relay (upload)
K11R (A1P)(V3 only)		Magnetic relay (main)
L1R (V3 only)		Reactor
L1R~L3R (W1 only)		Reactor
L4R (W1 only)		Reactor (outdoor fan motor)
M1C		Compressor motor
M1F, M2F		Fan motor
PS (A1P)(V3 only)		Switching power supply
PS (A2P)(W1 only)		Switching power supply
Q1DI	#	Earth leakage circuit breaker (30 mA)
R1, R2 (A1P) (V3 only)		Resistor
R1, R2 (A2P) (W1 only)		Resistor
R1T		Thermistor (air)
R2T		Thermistor (discharge)
R3T		Thermistor (suction)
R4T		Thermistor (heat exchanger)
R5T		Thermistor (heat exchanger middle)
R6T		Thermistor (liquid)
R7T (W1 only)		Thermistor (fin)
R10T (V3 only)		Thermistor (fin)
RC (A4P)(V3 only)		Signal receiver circuit
S1NPH		Pressure sensor
S1PH		High pressure switch
TC (A4P)(V3 only)		Signal transmission circuit
V1R (A1P)(V3 only)		Power module
V1R~V2R (A2P) (W1 only)		Power module
V2R~V3R (A1P) (V3 only)		Diode module
V3R (A2P)(W1 only)		Diode module
V1T (A1P)(V3 only)		IGBT (Insulated Gate Bipolar Transistor)
X1M		Terminal strip
Y1E, Y3E		Electronic expansion valve
Y1S		Solenoid valve (4-way valve)
Y3S		Solenoid valve (hot gas pass)
Z1C~Z9C		Noise filter (ferrite core)
Z1F~Z4F (A*P) (V3 only)		Noise filter
Z1F~Z3F (A1P) (W1 only)		Noise filter
Z4F (A3P)(W1 only)		Noise filter

\# Field supply
* Optional

Outdoor unit: hydro module

English		Translation
Compressor switch box		Compressor switch box
Control box		Control box
External outdoor ambient sensor option		External outdoor ambient sensor option
Hydro switch box supplied from compressor module		Hydro switch box supplied from compressor module
Hydro switch box		Hydro switch box
Indoor		Indoor
Normal kWh rate power supply		Normal kWh rate power supply
Only for normal power supply (standard)		Only for normal power supply (standard)
Only for preferential kWh rate power supply (compressor)		Only for preferential kWh rate power supply (compressor)
Outdoor		Outdoor
Use normal kWh rate power supply for hydro switch box		Use normal kWh rate power supply for hydro switch box
A1P		Main PCB
A2P		Current loop PCB
B1L		Flow sensor
E11H		Flextube heater (15.6 W)
E12H		Expansion vessel heater (50 W)
E13H		PHE heater (50 W)
E14H		Internal pipe heater 1 (50 W)
E15H		Internal pipe heater 2 (33 W)
F1U (A1P)		Fuse T5 A 250V
K*R (A1P)		Magnetic relay
M1P		Main supply pump
Q4DI	#	Earth leakage circuit breaker
R1T		Outlet water heat exchanger thermistor
R3T		Refrigerant liquid side thermistor
R4T		Inlet water thermistor
R6T	*	External outdoor ambient sensor
S1L		Flow switch
TR1		Power supply transformer
X*A, X*Y (A1P, A2P)		Connector
X*M		Terminal strip

*: Optional
#: Field supply

Control box

English	Translation
BUH option	Backup heater option
Control box	Control box
DHW option	Domestic hot water option
DHW pump	Domestic hot water pump
Dual set point application (refer to installation manual)	Dual set point application (refer to installation manual)
Heat pump convector	Heat pump convector
Hydro switch box	Hydro switch box
NO valve	Normal open valve
Only for ***	Only for ***
Only for ext. sensor (floor or ambient)	Only for external sensor (floor or ambient)
Only for wired On/OFF thermostat	Only for wired On/OFF thermostat

English		Translation
Only for wireless On/OFF thermostat		Only for wireless On/OFF thermostat
Option box		Option box
Preferential kWh rate power supply contact: 5 V DC detection (voltage supplied by PCB)		Preferential kWh rate power supply contact: 5 V DC detection (voltage supplied by PCB)
A3P	*	On/OFF thermostat (PC=power circuit)
A4P	*	Extension PCB (control, optional)
A5P		User interface PCB
A7P	*	Receiver PCB (wireless On/OFF thermostat)
DS1 (A4P)	*	DIP switch
E4H	*	Booster heater (3 kW)
F1U		Fuse T 5 A 500 V
F1U (A4P)		Fuse T 2 A 250 V
F2B	*	Overcurrent fuse booster heater
F2U (A4P)		Fuse T 2 A 250 V for 3-way valve
K1A		Relay for heating
K1	*	Terminal strip
K2A		Relay for cooling
K2	*	Booster heater
K3M	*	Contactor booster heater
M2P	#	Domestic hot water pump
M2S	#	Shut-off valve
M3S		3-way valve for domestic hot water
M4S	*	Valve kit
PC (A7P)		Power circuit
Q2L	*	Thermal protector booster heater
Q5DI, Q6DI		Earth leakage circuit breaker
R1H (A3P)	*	Humidity sensor
R1T (A3P)	*	Ambient sensor On/OFF thermostat
R1T (A5P)		Ambient sensor user interface
R2T	*	External indoor floor/ambient thermistor
R5T	*	Domestic hot water thermistor
S1S	#	Preferential kWh rate power supply contact
STB	*	Thermal protector booster heater
X*A (A4P)		Connector
X*M		Terminal strip

*: Optional
#: Field supply

Control box option: backup heater

English		Translation
BUH option		Backup heater option
Control box		Control box
Only for ***		Only for ***
E1H		Backup heater element (1 kW)
E2H		Backup heater element (2 kW)
E3H		Backup heater element
F1B	*	Overcurrent fuse backup heater
F1T, F2T	*	Thermal fuse backup heater

English		Translation
F1U		Fuse T 5 A 500 V backup heater option
K1M	*	Contactor backup heater (step 1)
K1R	*	Relay backup heater (step 1)
K2M	*	Contactor backup heater (step 2) (only for *9W)
K2R	*	Relay backup heater (step 2) (only for *9W)
K5M	*	Safety contactor backup heater (only for *9W)
Q1DI	#	Earth leakage circuit breaker
Q1L	*	Thermal protector backup heater
R2T	*	Outlet backup heater thermistor
X*M		Terminal strip

*: Optional
#: Field supply

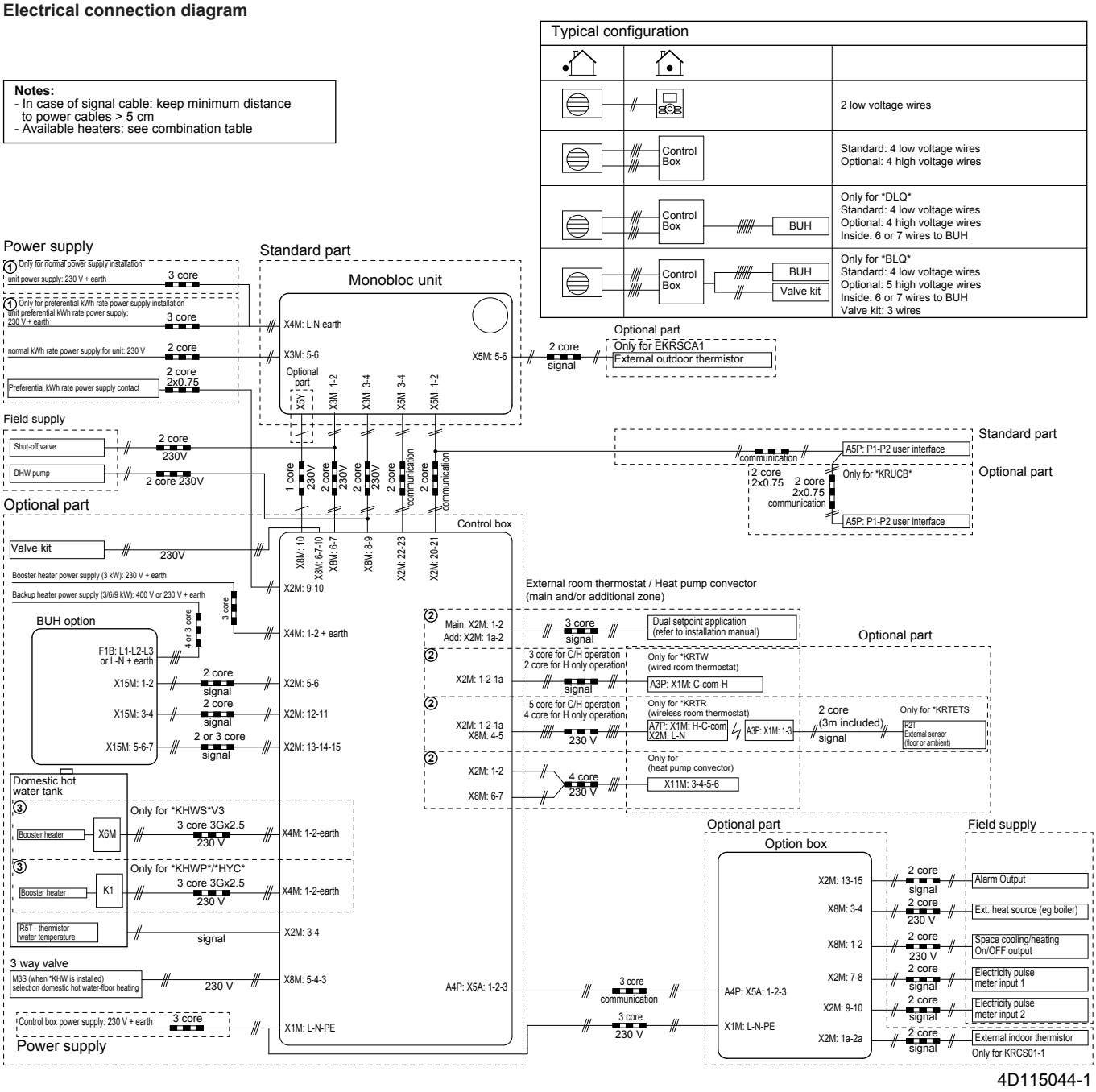
Control box option: option box

English	Translation
Alarm output	Alarm output
Control box	Control box
Electric pulse meter inputs: 5 V DC pulse detection (voltage supplied by PCB)	Electric pulse meter inputs: 5 V DC pulse detection (voltage supplied by PCB)

English		Translation
Ext. heat source		External heat source
External indoor ambient sensor option		External indoor ambient sensor option
Indoor		Indoor
Max. load		Maximum load
Max. voltage		Maximum voltage
Min. load		Minimum load
Option box		Option box
ON		ON
OFF		OFF
A4P		Extension PCB (control, optional)
DS1 (A4P)		DIP switch
F1U (A4P)		Fuse T 2 A 250 V
F2U (A4P)		Fuse T 2 A 250 V for 3-way valve
R6T	*	External indoor ambient sensor option
S5P-S6P	#	Electrical meters
X*A (A4P)		Connector
X*M		Terminal strip

*: Optional
#: Field supply

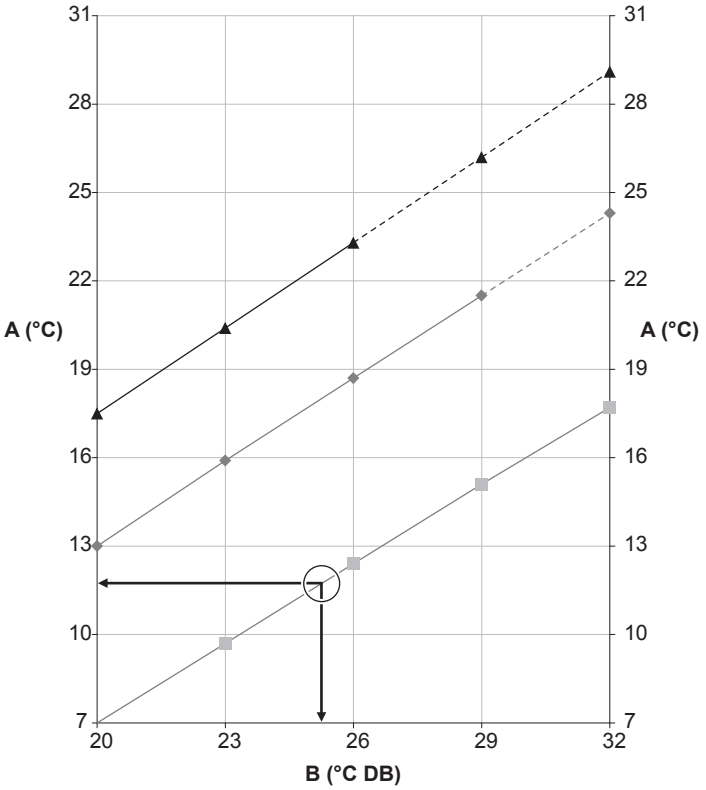
Electrical connection diagram



4D115044-1

14.4 Valve kit necessity

For reversible systems (heating+cooling) in which a backup heater is installed, the installation of valve kit EKMBHBP1 is required if condensation is expected inside the backup heater.



A Leaving water evaporator temperature
B Dry-bulb temperature
Relative humidity 40%
Relative humidity 60%
Relative humidity 80%

Example: Given are an ambient temperature of 25°C and a relative humidity of 40%. If the leaving water evaporator temperature is <12°C, condensation will occur.

Note: See the psychrometric chart for more information.

14.5 ESP curve: Outdoor unit

Note: A flow error will occur when the minimum water flow rate is not reached.

4D115246

A External static pressure
B Water flow rate
C Operation range
D Minimum flow during normal operation.
E Minimum flow during defrost operation in case the system contains a backup heater / DHW tank with recirculation pump / glycol.
F Minimum flow during defrost operation in case does NOT contain a backup heater / DHW tank with recirculation pump[(a)] / glycol

(a) If an EKHWP tank is installed, no recirculation pump is required.

Notes:

- About the dashed lines: The operation area is extended to lower flow rates only in case the unit operates with heat pump only, and the temperature of the flow medium is sufficiently high. (This does not apply to start-up operation, defrost operation, and backup heater operation in case a backup heater is installed.)
- The upper operation range is only valid if the flow medium is water. If glycol is added to the system, the operation range limit is lower.
- Selecting a flow outside the operating area can damage the unit or cause the unit to malfunction.

15 Glossary

Dealer

Sales distributor for the product.

Authorized installer

Technical skilled person who is qualified to install the product.

User

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

Applicable legislation

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

Service company

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

Installation manual

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

Operation manual

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

Maintenance instructions

Instruction manual specified for a certain product or application, which explains (if relevant) how to install, configure, operate and/or maintain the product or application.

Accessories

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

Optional equipment

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

Field supply

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

Field settings table

[6.8.2] = ... **ID8281**

Applicable units

EDLQ011CAV3
EDLQ014CAV3
EDLQ016CAV3
EBLQ011CAV3
EBLQ014CAV3
EBLQ016CAV3
EDLQ011CAW1
EDLQ014CAW1
EDLQ016CAW1
EBLQ011CAW1
EBLQ014CAW1
EBLQ016CAW1

Notes

(*1) *B*
(*2) *D*

Field settings table						Installer setting at variance with default value	
Breadcrumb	Field code	Setting name			Range, step **Default value**	Date	Value
User settings							
└ Preset values							
└ Room temperature							
7.4.1.1		Comfort (heating)		R/W	[3-07]~[3-06], step: A.3.2.4 **21°C**		
7.4.1.2		Eco (heating)		R/W	[3-07]~[3-06], step: A.3.2.4 **19°C**		
7.4.1.3		Comfort (cooling)		R/W	[3-08]~[3-09], step: A.3.2.4 **24°C**		
7.4.1.4		Eco (cooling)		R/W	[3-08]~[3-09], step: A.3.2.4 **26°C**		
└ LWT main							
7.4.2.1	[8-09]	Comfort (heating)		R/W	[9-01]~[9-00], step: 1°C **45°C**		
7.4.2.2	[8-0A]	Eco (heating)		R/W	[9-01]~[9-00], step: 1°C **40°C**		
7.4.2.3	[8-07]	Comfort (cooling)		R/W	[9-03]~[9-02], step: 1°C **18°C**		
7.4.2.4	[8-08]	Eco (cooling)		R/W	[9-03]~[9-02], step: 1°C **20°C**		
7.4.2.5		Comfort (heating)		R/W	-10~10°C, step: 1°C **0°C**		
7.4.2.6		Eco (heating)		R/W	-10~10°C, step: 1°C **-2°C**		
7.4.2.7		Comfort (cooling)		R/W	-10~10°C, step: 1°C **0°C**		
7.4.2.8		Eco (cooling)		R/W	-10~10°C, step: 1°C **2°C**		
└ Tank temperature							
7.4.3.1	[6-0A]	Storage comfort		R/W	30~[6-0E]ºC, step: 1ºC **55ºC**		
7.4.3.2	[6-0B]	Storage eco		R/W	30~min(50, [6-0E])ºC, step: 1ºC **45ºC**		
7.4.3.3	[6-0C]	Reheat		R/W	30~min(50, [6-0E])ºC, step: 1ºC **45ºC**		
└ Quiet level							
7.4.4				R/W	0: Level 1 **1: Level 2** 2: Level 3		
└ Electricity price							
7.4.5.1	[C-0C] [D-0C]	High		R/W	0,00~990/kWh **0/kWh**		
7.4.5.2	[C-0D] [D-0D]	Medium		R/W	0,00~990/kWh **0/kWh**		
7.4.5.3	[C-0E] [D-0E]	Low		R/W	0,00~990/kWh **0/kWh**		
└ Fuel price							
7.4.6				R/W	0,00~990/kWh 0,00~290/MBtu **8,0/kWh**		
└ Set weather dependent							
└ Main							
└ Set weather-dependent heating							
7.7.1.1	[1-00]	Set weather-dependent heating	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
7.7.1.1	[1-01]	Set weather-dependent heating	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
7.7.1.1	[1-02]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00]°C, step: 1°C **45°C**		
7.7.1.1	[1-03]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C **35°C**		
└ Set weather-dependent cooling							
7.7.1.2	[1-06]	Set weather-dependent cooling	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
7.7.1.2	[1-07]	Set weather-dependent cooling	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
7.7.1.2	[1-08]	Set weather-dependent cooling	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C**		
7.7.1.2	[1-09]	Set weather-dependent cooling	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **18°C**		
└ Additional							
└ Set weather-dependent heating							
7.7.2.1	[0-00]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45, [9-06])°C, step: 1°C **35°C**		
7.7.2.1	[0-01]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **45°C**		
7.7.2.1	[0-02]	Set weather-dependent heating	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
7.7.2.1	[0-03]	Set weather-dependent heating	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C , step: 1°C **-10°C**		
└ Set weather-dependent cooling							
7.7.2.2	[0-04]	Set weather-dependent cooling	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **8°C**		
7.7.2.2	[0-05]	Set weather-dependent cooling	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **12°C**		
7.7.2.2	[0-06]	Set weather-dependent cooling	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
7.7.2.2	[0-07]	Set weather-dependent cooling	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C , step: 1°C **20°C**		
Installer settings							
└ System layout							
└ Standard							
A.2.1.1	[E-00]	Unit type		R/O	0~5 **2: Monobloc**		
A.2.1.2	[E-01]	Compressor type		R/O	0~1 **1: 16**		
A.2.1.3	[E-02]	Indoor software type		R/O	**0: Type 1 (*1)** **1: Type 2 (*2)**		
A.2.1.7	[C-07]	Unit control method		R/W	0: LWT control 1: Ext RT control **2: RT control**		

Field settings table						Installer setting at variance with default value	
Breadcrumb	Field code	Setting name			Range, step **Default value**	Date	Value
A.2.1.8	[7-02]	Number of LWT zones		R/W	**0: 1 LWT zone** 1: 2 LWT zones		
A.2.1.9	[F-0D]	Pump operation mode		R/W	0: Continuous 1: Sample **2: Request**		
A.2.1.A	[E-04]	Power saving possible		R/O	**0~1** **0: No**		
A.2.1.B		User interface location		R/W	0: At unit **1: In room**		
A.2.1.C	[E-0D]	Glycol present		R/W	**0: No** 1: Yes		
└ Options							
A.2.2.A	[D-02]	DHW pump		R/W	**0: No** 1: Secondary rtrn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.2.2.B	[C-08]	External sensor		R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
└ Control box							
A.2.2.E.1	[E-03]	Backup heater steps		R/W	**0: No BUH** 1: 1 step 2: 2 steps		
A.2.2.E.2	[5-0D]	BUH type		R/W	0~5 **1: 1P,(1/1+2)** 4: 3PN,(1/2) 5: 3PN,(1/1+2)		
A.2.2.E.3	[D-01]	Preferential kWh rate		R/W	**0: No** 1: Open tariff 2: Closed tariff		
A.2.2.E.4	[E-05]	DHW operation		R/W	**0: No** 1: Yes		
A.2.2.E.5	[C-05]	Contact type main		R/W	**1: Thermo ON/OFF** 2: C/H request		
A.2.2.E.6	[C-06]	Contact type add.		R/W	0~2 **1: Thermo ON/OFF**		
└ Option box							
A.2.2.F.1	[C-02]	Ext. backup heat src		R/W	**0: No** 1: Bivalent 2: - 3: -		
A.2.2.F.2	[C-09]	Alarm output		R/W	**0: Normally open** 1: Normally closed		
A.2.2.F.3	[D-08]	External kWh meter 1		R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.2.2.F.4	[D-09]	External kWh meter 2		R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.2.2.F.5	[C-08]	External sensor		R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
A.2.2.F.6	[D-04]	PCC by digital inputs		R/O	**0: No** 1: Yes		
└ Capacities							
A.2.3.1	[6-02]	Booster heater		R/W	0~10kW, step: 0,2kW **3kW**		
A.2.3.2	[6-03]	BUH: step 1		R/W	0~10kW, step: 0,2kW **3kW**		
A.2.3.3	[6-04]	BUH: step 2		R/W	0~10kW, step: 0,2kW **0kW**		
└ Space operation							
└ LWT settings							
└ Main							
A.3.1.1.1		LWT setpoint mode		R/W	0: Fixed **1: Weather dep.** 2: Fixed + scheduled 3: WD + scheduled		
A.3.1.1.2.1	[9-01]	Temperature range	Minimum temp (heating)	R/W	15~37°C, step: 1°C **25°C**		
A.3.1.1.2.2	[9-00]	Temperature range	Maximum temp (heating)	R/W	37~55°C, step: 1°C **55°C**		
A.3.1.1.2.3	[9-03]	Temperature range	Minimum temp (cooling)	R/W	5~18°C, step: 1°C **5°C**		
A.3.1.1.2.4	[9-02]	Temperature range	Maximum temp (cooling)	R/W	18~22°C, step: 1°C **22°C**		
A.3.1.1.5	[8-05]	Modulated LWT		R/W	0: No **1: Yes**		
A.3.1.1.7	[9-0B]	Emitter type		R/W	**0: Quick** 1: Slow		
└ Additional							
A.3.1.2.1		LWT setpoint mode		R/W	0: Fixed **1: Weather dep.** 2: Fixed + scheduled 3: WD + scheduled		
A.3.1.2.2.1	[9-05]	Temperature range	Minimum temp (heating)	R/W	15~37°C, step: 1°C **25°C**		
A.3.1.2.2.2	[9-06]	Temperature range	Maximum temp (heating)	R/W	37~55°C, step: 1°C **55°C**		
A.3.1.2.2.3	[9-07]	Temperature range	Minimum temp (cooling)	R/W	5~18°C, step: 1°C **5°C**		
A.3.1.2.2.4	[9-08]	Temperature range	Maximum temp (cooling)	R/W	18~22°C, step: 1°C **22°C**		

Field settings table

Breadcrumb	Field code	Setting name			Range, step **Default value**	Installer setting at variance with default value Date	 Value
		└ Delta T source					
A.3.1.3.1	[9-09]	Heating		R/W	3~10°C, step: 1°C **5°C**		
A.3.1.3.2	[9-0A]	Cooling		R/W	3~10°C, step: 1°C **5°C**		
		└ Room thermostat					
A.3.2.1.1	[3-07]	Room temp. range	Minimum temp (heating)	R/W	12~18°C, step: A.3.2.4 **16°C**		
A.3.2.1.2	[3-06]	Room temp. range	Maximum temp (heating)	R/W	18~30°C, step: A.3.2.4 **30°C**		
A.3.2.1.3	[3-09]	Room temp. range	Minimum temp (cooling)	R/W	15~25°C, step: A.3.2.4 **15°C**		
A.3.2.1.4	[3-08]	Room temp. range	Maximum temp (cooling)	R/W	25~35°C, step: A.3.2.4 **35°C**		
A.3.2.2	[2-0A]	Room temp. offset		R/W	-5~5°C, step: 0,5°C **0°C**		
A.3.2.3	[2-09]	Ext. room sensor offset		R/W	-5~5°C, step: 0,5°C **0°C**		
A.3.2.4		Room temp. step		R/W	0: 0,5 °C **1: 1 °C**		
		└ Operation range					
A.3.3.1	[4-02]	Space heating OFF temp		R/W	14~35 °C, step: 1°C 3**5°C**		
A.3.3.2	[F-01]	Space cooling On temp		R/W	10~35°C, step: 1°C **20°C**		
└ Domestic hot water (DHW)							
		└ Type					
A.4.1	[6-0D]			R/W	0: Reheat only **1: Reheat + Scheduled** 2: Scheduled only		
		└ Disinfection					
A.4.4.1	[2-01]	Disinfection		R/W	0: No **1: Yes**		
A.4.4.2	[2-00]	Operation day		R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
A.4.4.3	[2-02]	Start time		R/W	0~23 hour, step: 1 hour **23**		
A.4.4.4	[2-03]	Temperature target		R/W	55~75°C, step: 5°C **70°C**		
A.4.4.5	[2-04]	Duration		R/W	5~60 min, step: 5 hour **10**		
		└ Maximum set point					
A.4.5	[6-0E]			R/W	If [E-07]=0 40~75°C, step: 1°C **60°C** If [E-07]=5 40~80°C, step: 1°C **80°C**		
		└ SP mode					
A.4.6	[2-01]			R/W	**0: Fixed** 1: Weather dep.		
		└ Weather dependent curve					
A.4.7	[0-0B]	Weather-dependent curve		R/W	35~[6-0E]°C, step: 1°C **55°C**		
A.4.7	[0-0C]	Weather-dependent curve		R/W	45~[6-0E]°C, step: 1°C **60°C**		
A.4.7	[0-0D]	Weather-dependent curve		R/W	10~25°C, step: 1°C **15°C**		
A.4.7	[0-0E]	Weather-dependent curve		R/W	-40~5°C, step: 1°C **-10°C**		
└ Heat sources							
		└ Backup heater					
A.5.1.1	[4-00]	Operation mode		R/W	0~2 0: Disabled **1: Enabled**		
A.5.1.3	[4-07]	Enable BUH step 2		R/W	0: No **1: Yes**		
A.5.1.4	[5-01]	Equilibrium temp.		R/W	-15~35°C, step: 1°C **-4°C**		
└ System operation							
		└ Auto restart					
A.6.1	[3-00]			R/W	0: No **1: Yes**		
		└ Preferential kWh rate					
A.6.2.1	[D-00]	Allowed heaters		R/W	0~3 **0: None** 1: BSH only 2: BUH only 3: All heaters		
A.6.2.2	[D-05]	Forced pump OFF		R/W	0: Forced off **1: As normal**		
		└ Averaging time					
A.6.4	[1-0A]			R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
		└ Ext amb. sensor offset					
A.6.5	[2-0B]			R/W	-5~5°C, step: 0,5°C **0°C**		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
	└ Boiler efficiency					
A.6.A	[7-05]		R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
	└ Emergency					
A.6.C			R/W	**0: Manual** 1: Automatic		
└ Overview settings						
A.8	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45, [9-06])°C, step: 1°C **35°C**		
A.8	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **45°C**		
A.8	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[0-04]	Leaving water value for high ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **8°C**		
A.8	[0-05]	Leaving water value for low ambient temp. for LWT add zone cooling WD curve.	R/W	[9-07]~[9-08]°C, step: 1°C **12°C**		
A.8	[0-06]	High ambient temp. for LWT add zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
A.8	[0-07]	Low ambient temp. for LWT add zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
A.8	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
A.8	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C**		
A.8	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C **45°C**		
A.8	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C **35°C**		
A.8	[1-04]	Weather dependent cooling of the main leaving water temperature zone.	R/W	0: Disabled **1: Enabled**		
A.8	[1-05]	Weather dependent cooling of the additional leaving water temperature zone.	R/W	0: Disabled **1: Enabled**		
A.8	[1-06]	Low ambient temp. for LWT main zone cooling WD curve.	R/W	10~25°C, step: 1°C **20°C**		
A.8	[1-07]	High ambient temp. for LWT main zone cooling WD curve.	R/W	25~43°C, step: 1°C **35°C**		
A.8	[1-08]	Leaving water value for low ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **22°C**		
A.8	[1-09]	Leaving water value for high ambient temp. for LWT main zone cooling WD curve.	R/W	[9-03]~[9-02]°C, step: 1°C **18°C**		
A.8	[1-0A]	What is the averaging time for the outdoor temp?	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
A.8	[2-00]	When should the disinfection function be executed?	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
A.8	[2-01]	Should the disinfection function be executed?	R/W	0: No 1**: Yes**		
A.8	[2-02]	When should the disinfection function start?	R/W	0~23 hour, step: 1 hour **23**		
A.8	[2-03]	What is the disinfection target temperature?	R/W	55~75°C, step: 5°C **70°C**		
A.8	[2-04]	How long must the tank temperature be maintained?	R/W	5~60 min, step: 5 min **10 min**		
A.8	[2-05]	Room antifrost temperature	R/W	4~16°C, step: 1°C **16°C**		
A.8	[2-06]	Room frost protection	R/W	0: Disabled **1: Enabled**		
A.8	[2-09]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
A.8	[3-01]	--		**0**		
A.8	[3-02]	--		**1**		
A.8	[3-03]	--		**4**		
A.8	[3-04]	--		**2**		
A.8	[3-05]	--		**1**		
A.8	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: A.3.2.4 **30°C**		
A.8	[3-07]	What is the mimimum desired room temperature in heating?	R/W	12~18°C, step: A.3.2.4 **16°C**		
A.8	[3-08]	What is the maximum desired room temperature in cooling?	R/W	25~35°C, step: A.3.2.4 **35°C**		
A.8	[3-09]	What is the minimum desired room temperature in cooling?	R/W	15~25°C, step: A.3.2.4 **15°C**		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.8	[4-00]	What is the BUH operation mode?	R/W	0~2 0: Disabled **1: Enabled**		
A.8	[4-01]	Which electric heater has priority?	R/W	0~2 **0: None** 1: BSH 2: BUH		
A.8	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~35°C, step: 1°C **35°C**		
A.8	[4-03]	Operation permission of the booster heater	R/W	0: Limited 1: No limit 2: Most optimum **3: Optimum** 4: Only legionella		
A.8	[4-04]	How to protect the water pipes from freezing	R/W	**0: Continuous pump operation** 1: Intermittent pump operation 2: No protection		
A.8	[4-05]	--		**0**		
A.8	[4-06]	-- (Do not change this value)		**0/1**		
A.8	[4-07]	Enable the second step of the backup heater?	R/W	0: No **1: Yes**		
A.8	[4-08]	--		**0**		
A.8	[4-09]	--		**1**		
A.8	[4-0A]	--		**0**		
A.8	[4-0B]	Automatic cooling/heating changeover hysteresis.	R/W	1~10°C, step: 0,5°C **1°C**		
A.8	[4-0D]	Automatic cooling/heating changeover offset.	R/W	1~10°C, step: 0,5°C **3°C**		
A.8	[4-0E]	Is the installer on site?	R/W	0: No **1: Yes**		
A.8	[5-00]	Is backup heater operation allowed above equilibrium temperature during space heating operation?	R/W	0: Allowed **1: Not allowed**		
A.8	[5-01]	What is the equilibrium temperature for the building?	R/W	-15~35°C, step: 1°C **-4°C**		
A.8	[5-02]	Space heating priority.	R/W	0: Disabled **1: Enabled**		
A.8	[5-03]	Space heating priority temperature.	R/W	-15~35°C, step: 1°C **0°C**		
A.8	[5-04]	Set point correction for domestic hot water temperature	R/W	0~20°C, step: 1°C **10°C**		
A.8	[5-05]	--		**50**		
A.8	[5-06]	--		**50**		
A.8	[5-07]	--		**50**		
A.8	[5-08]	--		**50**		
A.8	[5-09]	--		**20**		
A.8	[5-0A]	--		**20**		
A.8	[5-0B]	--		**20**		
A.8	[5-0C]	--		**20**		
A.8	[5-0D]	What type of backup heater installation is used?	R/W	0~5 **1: 1P,(1/1+2)** 4: 3PN,(1/2) 5: 3PN,(1/1+2)		
A.8	[5-0E]	--		**1**		
A.8	[6-00]	The temperature difference determining the heat pump ON temperature.	R/W	2~20°C, step: 1°C **2°C**		
A.8	[6-01]	The temperature difference determining the heat pump OFF temperature.	R/W	0~10°C, step: 1°C **2°C**		
A.8	[6-02]	What is the capacity of the booster heater?	R/W	0~10 kW, step: 0,2 kW **3 kW**		
A.8	[6-03]	What is the capacity of the backup heater step 1?	R/W	0~10 kW, step: 0,2 kW **3 kW**		
A.8	[6-04]	What is the capacity of the backup heater step 2?	R/W	0~10 kW, step: 0,2 kW **0 kW**		
A.8	[6-05]	--		**0**		
A.8	[6-06]	--		**0**		
A.8	[6-07]	--		**0**		
A.8	[6-08]	What is the hysteresis to be used in reheat mode	R/W	2~20ºC, step: 1ºC **10ºC**		
A.8	[6-09]	--		**0**		
A.8	[6-0A]	What is the desired comfort storage temperature?	R/W	30~[6-0E]ºC, step: 1ºC **55ºC**		
A.8	[6-0B]	What is the desired eco storage temperature?	R/W	30~min(50, [6-0E])ºC, step: 1ºC **45ºC**		
A.8	[6-0C]	What is the desired reheat temperature?	R/W	30~min(50, [6-0E])ºC, step: 1ºC **45ºC**		
A.8	[6-0D]	What is the desired DHW production type?	R/W	0: Reheat only **1: Reheat + Scheduled** 2: Scheduled only		
A.8	[6-0E]	What is the maximum temperature set point?	R/W	If [E-07]=0 40~75°C, step: 1°C **60°C** If [E-07]=5 40~80°C, step: 1°C **80°C**		
A.8	[7-00]	Domestic hot water booster heater overshoot temperature	R/W	0~4ºC, step: 1ºC **0ºC**		
A.8	[7-01]	Domestic hot water booster heater hysteresis	R/W	2~40ºC, step: 1ºC **2ºC**		
A.8	[7-02]	How many leaving water temperature zones are there?	R/O	**0: 1 LWT zone** 1: 2 LWT zones		
A.8	[7-03]	--		**2.5**		
A.8	[7-04]	--		**0**		
A.8	[7-05]	Boiler efficiency	R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
A.8	[8-00]	--		**1 min**		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.8	[8-01]	Maximum running time for domestic hot water operation	R/W	5~95 min, step: 5 min **30 min**		
A.8	[8-02]	Anti-recycling time	R/W	0~10 hour, step: 0,5 hour **3 hour**		
A.8	[8-03]	Booster heater delay timer	R/W	20~95 min, step: 5 min **50 min**		
A.8	[8-04]	Additional running time for the maximum running time.	R/W	0~95 min, step: 5 min **95 min**		
A.8	[8-05]	Allow modulation of the LWT to control the room temp?	R/W	0: No **1: Yes**		
A.8	[8-06]	Leaving water temperature maximum modulation.	R/W	0~10°C, step: 1°C **3°C**		
A.8	[8-07]	What is the desired comfort main LWT in cooling?	R/W	[9-03]~[9-02], step: 1°C **18°C**		
A.8	[8-08]	What is the desired eco main LWT in cooling?	R/W	[9-03]~[9-02], step: 1°C **20°C**		
A.8	[8-09]	What is the desired comfort main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **45°C**		
A.8	[8-0A]	What is the desired eco main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **40°C**		
A.8	[8-0B]	--		**13**		
A.8	[8-0C]	--		**10**		
A.8	[8-0D]	--		**16**		
A.8	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	37~55°C, step: 1°C **55°C**		
A.8	[9-01]	What is the mimimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
A.8	[9-02]	What is the maximum desired LWT for main zone in cooling?	R/W	18~22°C, step: 1°C **22°C**		
A.8	[9-03]	What is the mimimum desired LWT for main zone in cooling?	R/W	5~18°C, step: 1°C **5°C**		
A.8	[9-04]	Leaving water temperature overshoot temperature.	R/W	1~4°C, step: 1°C **1°C**		
A.8	[9-05]	What is the minimum desired LWT for add. zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
A.8	[9-06]	What is the maximum desired LWT for add. zone in heating?	R/W	37~55°C, step: 1°C **55°C**		
A.8	[9-07]	What is the minimum desired LWT for add. zone in cooling?	R/W	5~18°C, step: 1°C **5°C**		
A.8	[9-08]	What is the maximum desired LWT for add. zone in cooling?	R/W	18~22°C, step: 1°C **22°C**		
A.8	[9-09]	What is the desired delta T in heating?	R/W	3~10°C, step: 1°C **5°C**		
A.8	[9-0A]	What is the desired delta T in cooling?	R/W	3~10°C, step: 1°C **5°C**		
A.8	[9-0B]	What emitter type is connected to the main LWT zone?	R/W	**0: Quick** 1: Slow		
A.8	[9-0C]	Room temperature hysteresis.	R/W	1~6°C, step: 0,5°C **1 °C**		
A.8	[9-0D]	Pump speed limitation	R/W	0~8, step:1 0 : 100% 1~4 : 80~50% 5~8 : 80~50% **6**		
A.8	[9-0E]	--		**6**		
A.8	[A-00]	--		**1**		
A.8	[A-01]	--		**3**		
A.8	[A-02]	--		**0**		
A.8	[A-03]	--		**1**		
A.8	[A-04]	--		**0**		
A.8	[B-00]	--		**0**		
A.8	[B-01]	--		**2**		
A.8	[B-02]	--		**0**		
A.8	[B-03]	--		**0**		
A.8	[B-04]	--		**0**		
A.8	[C-00]	--		**0**		
A.8	[C-01]	--		**0**		
A.8	[C-02]	Is an external backup heat source connected?	R/W	**0: No** 1: Bivalent 2: - 3: -		
A.8	[C-03]	Bivalent activation temperature.	R/W	-25~25°C, step: 1°C **0°C**		
A.8	[C-04]	Bivalent hysteresis temperature.	R/W	2~10°C, step: 1°C **3°C**		
A.8	[C-05]	What is the thermo request contact type for the main zone?	R/W	**1: Thermo ON/OFF** 2: C/H request		
A.8	[C-06]	What is the thermo request contact type for the add. zone?		0~2 **1: Thermo ON/OFF**		
A.8	[C-07]	What is the unit control method in space operation?	R/W	0: LWT control 1: Ext RT control **2: RT control**		
A.8	[C-08]	Which type of external sensor is installed?	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
A.8	[C-09]	What is the required alarm output contact type?	R/W	**0: Normally open** 1: Normally closed		
A.8	[C-0A]	--		**0**		
A.8	[C-0C]	High electricity price decimal (Do not use)	R/W	0~7 **0**		
A.8	[C-0D]	Medium electricity price decimal (Do not use)	R/W	0~7 **0**		
A.8	[C-0E]	Low electricity price decimal (Do not use)	R/W	0~7 **0**		
A.8	[D-00]	Which heaters are permitted if prefer. kWh rate PS is cut?	R/W	0~3 **0: None** 1: BSH only 2: BUH only 3: All heaters		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.8	[D-01]	Forced off contact type	R/W	0~3 **0: No** 1: Open tariff 2: Closed tariff		
A.8	[D-02]	What type of DHW pump is installed?	R/W	**0: No** 1: Secondary rtrn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.8	[D-03]	Leaving water temperature compensation around 0°C.	R/W	0: Disabled 1: Enabled, shift 2°C (from -2 to 2°C) **2: Enabled, shift 4°C (from -2 to 2°C)** 3: Enabled, shift 2°C (from -4 to 4°C) 4: Enabled, shift 4°C (from -4 to 4°C)		
A.8	[D-04]	Is the option box used for PCC ?	R/O	**0: No** 1: Yes		
A.8	[D-05]	Is the pump allowed to run if prefer. kWh rate PS is cut?	R/W	0: Forced off **1: As normal**		
A.8	[D-07]	--		**0**		
A.8	[D-08]	Is an external kWh meter used for power measurement?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.8	[D-09]	Is an external kWh meter used for power measurement?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.8	[D-0A]	--		**0**		
A.8	[D-0B]	--		**2**		
A.8	[D-0C]	What is the high electricity price (Do not use)	R/W	0~49 **0**		
A.8	[D-0D]	What is the medium electricity price (Do not use)	R/W	0~49 **0**		
A.8	[D-0E]	What is the low electricity price (Do not use)	R/W	0~49 **0**		
A.8	[E-00]	Which type of unit is installed?	R/O	0~5 **2: Monobloc**		
A.8	[E-01]	Which type of compressor is installed?	R/O	**0~1** **1: 16**		
A.8	[E-02]	What is the indoor unit software type?	R/O	**0: Type 1 (*1)** **1: Type 2 (*2)**		
A.8	[E-03]	What is the number of backup heater steps?	R/W	**0: No BUH** 1: 1 step 2: 2 steps		
A.8	[E-04]	Is the power saving function available on the outdoor unit?	R/O	**0~1** **0: No**		
A.8	[E-05]	Can the system prepare domestic hot water?	R/W	**0: No** 1: Yes		
A.8	[E-06]	--		**1**		
A.8	[E-07]	What kind of DHW tank is installed?		**0: EKHWS** 5: EKHWP		
A.8	[E-08]	Power saving function for outdoor unit.	R/W	**0: Disabled** 1: Enabled		
A.8	[E-09]	--		**0**		
A.8	[E-0A]	--		**0**		
A.8	[E-0B]	--		**0**		
A.8	[E-0C]	--		**0**		
A.8	[E-0D]	Is the system filled with glycol ?	R/W	**0: No** 1: Yes		
A.8	[E-0E]	--		0		
A.8	[F-00]	Pump operation allowed outside range.	R/W	**0: Disabled** 1: Enabled		
A.8	[F-01]	Above which outdoor temperature is cooling allowed?	R/W	10~35°C, step: 1°C **20°C**		
A.8	[F-02]	--		**3**		
A.8	[F-03]	--		**5**		
A.8	[F-04]	--		**0**		
A.8	[F-05]	--		**0**		
A.8	[F-06]	--		**0**		
A.8	[F-09]	Pump operation during flow abnormality.	R/W	**0: Disabled** 1: Enabled		
A.8	[F-0A]	--		**0**		
A.8	[F-0B]	--		**0**		
A.8	[F-0C]	--		**1**		
A.8	[F-0D]	What is the pump operation mode?	R/W	0: Continuous 1: Sample **2: Request**		

EAC

Copyright 2018 Daikin

DAIKIN EUROPE N.V.

Zandvoordestraat 300, B-8400 Oostende, Belgium

4P522034-1 2018.01