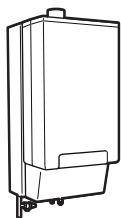




Installer reference guide

# Daikin Altherma R Hybrid



CHYHBH05AF  
CHYHBH08AF

EHYKOMB33AA

# Table of contents

<b>1</b>	<b>About the product</b>	<b>6</b>
<b>2</b>	<b>About this document</b>	<b>8</b>
2.1	Meaning of warnings and symbols .....	9
2.2	Installer reference guide at a glance.....	10
<b>3</b>	<b>General safety precautions</b>	<b>12</b>
3.1	For the installer .....	12
3.1.1	General.....	12
3.1.2	Installation site.....	13
3.1.3	Refrigerant — in case of R410A or R32.....	14
3.1.4	Water .....	15
3.1.5	Electrical.....	16
3.1.6	Gas.....	17
3.1.7	Gas exhaust.....	18
3.1.8	Local legislation.....	18
<b>4</b>	<b>Specific installer safety instructions</b>	<b>20</b>
<b>5</b>	<b>About the box</b>	<b>27</b>
5.1	Indoor unit.....	27
5.1.1	To unpack the indoor unit .....	27
5.1.2	To remove the accessories from the indoor unit.....	28
5.2	Gas boiler.....	29
5.2.1	To unpack the gas boiler.....	29
5.2.2	To remove the accessories from the gas boiler.....	30
<b>6</b>	<b>About the units and options</b>	<b>31</b>
6.1	Identification .....	31
6.1.1	Identification label: Indoor unit.....	31
6.1.2	Identification label: Gas boiler.....	32
6.2	Combining units and options .....	33
6.2.1	Possible options for the indoor unit.....	33
6.2.2	Possible options for the gas boiler .....	35
6.2.3	Possible combinations of indoor unit and outdoor unit.....	41
6.2.4	Possible combinations of indoor unit and domestic hot water tank.....	41
<b>7</b>	<b>Unit installation</b>	<b>42</b>
7.1	Preparing the installation site .....	42
7.1.1	Installation site requirements of the indoor unit.....	42
7.1.2	Special requirements for R32 units .....	44
7.1.3	Installation patterns.....	44
7.2	Opening and closing the units.....	49
7.2.1	About opening the units .....	49
7.2.2	To open the switch box cover of the indoor unit.....	49
7.2.3	To open the gas boiler .....	50
7.2.4	To open the switch box cover of the gas boiler .....	50
7.2.5	To close the indoor unit.....	51
7.2.6	To close the gas boiler .....	51
7.2.7	To install the gas boiler cover plate.....	52
7.3	Mounting the indoor unit.....	52
7.3.1	About mounting the indoor unit .....	52
7.3.2	Precautions when mounting the indoor unit.....	52
7.3.3	To install the indoor unit .....	52
7.4	Mounting the gas boiler .....	54
7.4.1	To install the gas boiler.....	54
7.4.2	To install the condensate trap.....	55
7.5	Connecting the boiler to the flue gas system.....	57
7.5.1	To change the gas boiler to 80/125 concentric connection.....	58
7.5.2	To change the 60/100 concentric connection to a dual pipe connection .....	58
7.5.3	Calculate the total piping length .....	59
7.5.4	Appliance categories and pipe lengths .....	60
7.5.5	Applicable materials .....	64
7.5.6	Flue pipe position .....	65
7.5.7	Insulation of the gas exhaust and air intake .....	67
7.5.8	Fitting a horizontal flue system .....	67

7.5.9	Fitting a vertical flue system.....	67
7.5.10	Plume management kit.....	67
7.5.11	Flues in voids.....	68
7.5.12	About securing the flue system.....	69
7.5.13	Placing brackets on the flue gas piping.....	69
7.6	Condensate pipe work .....	74
7.6.1	Internal connections.....	75
7.6.2	External connections .....	76
<b>8</b>	<b>Piping installation</b>	<b>77</b>
8.1	Preparing refrigerant piping.....	77
8.1.1	Refrigerant piping requirements.....	77
8.1.2	Refrigerant piping insulation .....	78
8.2	Connecting the refrigerant piping.....	79
8.2.1	About connecting the refrigerant piping .....	79
8.2.2	Precautions when connecting the refrigerant piping .....	79
8.2.3	Guidelines when connecting the refrigerant piping .....	80
8.2.4	Pipe bending guidelines.....	81
8.2.5	To flare the pipe end .....	81
8.2.6	To braze the pipe end.....	82
8.2.7	Using the stop valve and service port .....	82
8.2.8	Usage of reducers to connect the piping to the outdoor unit .....	84
8.2.9	To connect the refrigerant piping to the indoor unit .....	84
8.3	Checking the refrigerant piping .....	85
8.3.1	About checking the refrigerant piping .....	85
8.3.2	Precautions when checking the refrigerant piping.....	85
8.3.3	To check for leaks .....	85
8.3.4	To perform vacuum drying .....	86
8.3.5	To insulate the refrigerant piping.....	87
8.4	Charging refrigerant.....	87
8.4.1	About charging refrigerant .....	87
8.4.2	About the refrigerant.....	88
8.4.3	Precautions when charging refrigerant.....	89
8.4.4	To determine the additional refrigerant amount .....	89
8.4.5	To determine the complete recharge amount .....	89
8.4.6	To charge additional refrigerant.....	89
8.4.7	To fix the fluorinated greenhouse gases label .....	90
8.5	Preparing water piping.....	90
8.5.1	Water circuit requirements .....	90
8.5.2	Formula to calculate the expansion vessel pre-pressure .....	94
8.5.3	To check the water volume and flow rate .....	94
8.5.4	Changing the pre-pressure of the expansion vessel .....	96
8.5.5	To check the water volume: Examples.....	97
8.6	Connecting water piping .....	97
8.6.1	About connecting the water piping.....	97
8.6.2	Precautions when connecting the water piping .....	98
8.6.3	Connecting the water piping of the indoor unit .....	98
8.6.4	Connecting the water piping of the gas boiler.....	99
8.6.5	To fill the space heating circuit.....	101
8.6.6	To fill the domestic water circuit of the gas boiler .....	101
8.6.7	To fill the domestic hot water tank.....	101
8.6.8	To insulate the water piping.....	101
8.7	Connecting the gas piping.....	102
8.7.1	To connect the gas pipe.....	102
8.7.2	To perform an air purge on the gas supply .....	102
<b>9</b>	<b>Electrical installation</b>	<b>103</b>
9.1	About connecting the electrical wiring.....	103
9.1.1	Precautions when connecting the electrical wiring .....	103
9.1.2	Guidelines when connecting the electrical wiring .....	104
9.1.3	Overview of electrical connections except external actuators .....	105
9.1.4	Overview of electrical connections for external and internal actuators .....	105
9.2	Connections to the indoor unit.....	107
9.2.1	To connect the electrical wiring to the indoor unit .....	107
9.2.2	To connect the main power supply of the indoor unit .....	108
9.2.3	To connect the main power supply of the gas boiler .....	109
9.2.4	To connect the communication cable between gas boiler and indoor unit .....	109
9.2.5	To connect the user interface .....	111
9.2.6	To connect the shut-off valve.....	112
9.2.7	To connect the domestic hot water pump .....	113

9.2.8	To connect the alarm output.....	113
9.2.9	To connect the space heating ON/OFF output .....	114
9.2.10	To connect the safety thermostat.....	114
<b>10</b>	<b>Configuration</b>	<b>116</b>
10.1	Indoor unit.....	116
10.1.1	Overview: Configuration.....	116
10.1.2	Basic configuration .....	121
10.1.3	Advanced configuration/optimisation .....	135
10.1.4	Menu structure: Overview user settings.....	152
10.1.5	Menu structure: Overview installer settings.....	153
10.2	Gas boiler.....	155
10.2.1	Overview: Configuration.....	155
10.2.2	Basic configuration .....	155
<b>11</b>	<b>Operation</b>	<b>165</b>
11.1	Overview: Operation .....	165
11.2	Heating .....	165
11.3	Domestic hot water .....	165
11.3.1	Flow resistance graph for appliance domestic hot water circuit .....	166
11.4	Operation modes.....	166
<b>12</b>	<b>Commissioning</b>	<b>168</b>
12.1	Overview: Commissioning.....	168
12.2	Precautions when commissioning .....	169
12.3	Checklist before commissioning .....	169
12.4	Checklist during commissioning.....	170
12.4.1	To perform a wiring error check.....	170
12.4.2	To check the minimum flow rate .....	171
12.4.3	Air purge function.....	171
12.4.4	To perform a test run .....	173
12.4.5	To perform an actuator test run .....	174
12.4.6	Underfloor heating screed dryout.....	175
12.4.7	To perform a gas pressure test .....	178
12.4.8	To perform a test run on the gas boiler .....	178
<b>13</b>	<b>Hand-over to the user</b>	<b>180</b>
<b>14</b>	<b>Maintenance and service</b>	<b>181</b>
14.1	Maintenance safety precautions .....	181
14.1.1	Opening the indoor unit .....	181
14.2	Checklist for yearly maintenance of the indoor unit.....	181
14.3	To disassemble the gas boiler.....	183
14.4	To clean the inside of the gas boiler .....	186
14.5	To assemble the gas boiler.....	186
<b>15</b>	<b>Troubleshooting</b>	<b>189</b>
15.1	Overview: Troubleshooting.....	189
15.2	Precautions when troubleshooting.....	189
15.3	Solving problems based on symptoms .....	190
15.3.1	Symptom: The unit is NOT heating or cooling as expected.....	190
15.3.2	Symptom: The compressor does NOT start (space heating) .....	191
15.3.3	Symptom: The system is making gurgling noises after commissioning .....	191
15.3.4	Symptom: The pump is making noise (cavitation).....	192
15.3.5	Symptom: The pressure relief valve opens .....	192
15.3.6	Symptom: The water pressure relief valve leaks .....	192
15.3.7	Symptom: The space is NOT sufficiently heated at low outdoor temperatures.....	193
15.3.8	Symptom: The pressure at the tapping point is temporarily unusually high .....	193
15.3.9	Symptom: Tank disinfection function is NOT completed correctly (AH-error) .....	193
15.3.10	Symptom: Boiler abnormality detection (HJ-11 error).....	194
15.3.11	Symptom: Boiler/hydrobox combination abnormality (UA-52 error).....	194
15.3.12	Symptom: The burner does NOT ignite.....	194
15.3.13	Symptom: The burner ignites noisily.....	195
15.3.14	Symptom: The burner resonates.....	195
15.3.15	Symptom: No space heating by the gas boiler.....	195
15.3.16	Symptom: The power is reduced .....	196
15.3.17	Symptom: Space heating does NOT reach the temperature.....	196
15.3.18	Symptom: Hot water does NOT reach the temperature (no tank installed).....	196
15.3.19	Symptom: Hot water does NOT reach the temperature (tank installed).....	197
15.4	Solving problems based on error codes .....	197
15.4.1	Error codes: Overview .....	197



<b>16 Disposal</b>	<b>203</b>
16.1 Overview: Disposal .....	203
16.2 To pump down .....	203
16.3 To start and stop forced cooling .....	204
<b>17 Technical data</b>	<b>206</b>
17.1 Piping diagram: Indoor unit .....	206
17.2 Wiring diagram: Indoor unit .....	207
17.3 Wiring diagram: Gas boiler .....	212
17.4 Table 1 – Maximum refrigerant charge allowed in a room: indoor unit .....	213
17.5 Table 2 – Minimum floor area: indoor unit .....	215
17.6 Table 3 – Minimum bottom opening area for natural ventilation: indoor unit .....	216
17.7 ESP curve: Indoor unit .....	219
17.8 Technical specifications: Gas boiler .....	220
17.8.1 General .....	220
17.8.2 Energy-related products specifications .....	222
17.8.3 Appliance category and supply pressure .....	223
<b>18 Glossary</b>	<b>227</b>
<b>19 Field settings table</b>	<b>228</b>

# 1 About the product



## Especially for UK:

The Benchmark Scheme

Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturer's instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out installation, commissioning and servicing work in accordance with the Benchmark Code of Practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit <http://www.centralheating.co.uk> for more information.

Approvals

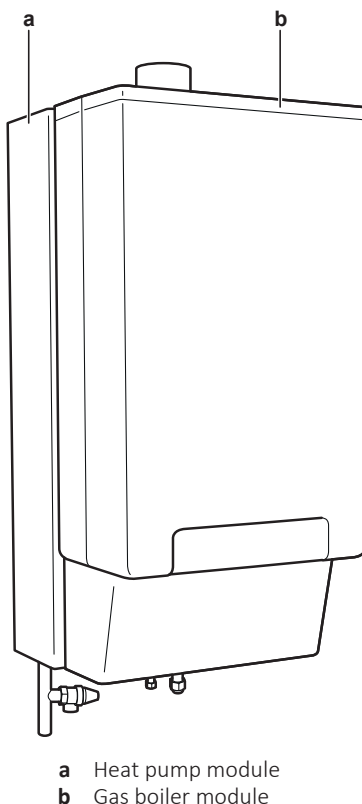
British Gas Service listing:

EHYKOMB33AA\*: G.C.N. 47-464-01

The product (hybrid system) is composed of two modules:

- heat pump module,
- gas boiler module.

These modules **MUST** always be installed and used together.





#### INFORMATION

This product is intended for domestic use only.

## 2 About this document

### Target audience

Authorised installers

### Documentation set

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

- **General safety precautions:**

- Safety instructions that you must read before installing
- Format: Paper (in the box of the indoor unit)

- **Operation manual:**

- Quick guide for basic usage
- Format: Paper (in the box of the indoor unit)

- **User reference guide:**

- Detailed step-by-step instructions and background information for basic and advanced usage
- Format: Digital files on <https://www.daikin.eu>. Use the search function 🔍 to find your model.

- **Installation manual – heat pump module:**

- Installation instructions
- Format: Paper (in the box of the indoor unit)

- **Installation and operation manual – gas boiler module:**

- Installation and operation instructions
- Format: Paper (in the box of the gas boiler)

- **Installation manual – outdoor unit:**

- Installation instructions
- Format: Paper (in the box of the outdoor unit)

- **Installer reference guide:**

- Preparation of the installation, reference data, ...
- Format: Digital files on <https://www.daikin.eu>. Use the search function 🔍 to find your model.

- **Addendum book for optional equipment:**

- Additional info about how to install optional equipment
- Format: Paper (in the box of the indoor unit) + Digital files on <https://www.daikin.eu>. Use the search function 🔍 to find your model.

The latest revision of the supplied documentation is published on the regional Daikin website and is available via your dealer.

The original instructions are written in English. All other languages are translations of the original instructions.

### Technical engineering data

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

## 2.1 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/SCALDING**

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



### **DANGER: RISK OF EXPLOSION**

Indicates a situation that could result in explosion.



### **DANGER: RISK OF POISONING**

Indicates a situation that could result in poisoning.



### **WARNING**

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



### **WARNING: PROTECT AGAINST FROST**

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



### **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.

Symbols used on the unit:

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.

Symbol	Explanation
	The unit contains rotating parts. Be careful when servicing or inspecting the unit.

Symbols used in the documentation:

Symbol	Explanation
	Indicates a figure title or a reference to it. <b>Example:</b> "▲ 1–3 Figure title" means "Figure 3 in chapter 1".
	Indicates a table title or a reference to it. <b>Example:</b> "■ 1–3 Table title" means "Table 3 in chapter 1".

## 2.2 Installer reference guide at a glance

Chapter	Description
About the product	Required combination of heat pump module and gas boiler module
About the documentation	What documentation exists for the installer
General safety precautions	Safety instructions that you must read before installing
Specific installer safety instructions	
About the box	How to unpack the units and remove their accessories
About the units and options	<ul style="list-style-type: none"> <li>How to identify the units</li> <li>Possible combinations of units and options</li> </ul>
Unit installation	What to do and know to install the system, including information on how to prepare for an installation
Piping installation	What to do and know to install the piping of the system, including information on how to prepare for an installation
Electrical installation	What to do and know to install the electrical components of the system, including information on how to prepare for an installation
Configuration	What to do and know to configure the system after it is installed
Operation	Operation modes of the gas boiler module
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

Chapter	Description
Glossary	Definition of terms
Field settings table	<p>Table to be filled in by the installer, and kept for future reference</p> <p><b>Note:</b> 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.</p>

## 3 General safety precautions

### In this chapter

3.1	For the installer.....	12
3.1.1	General.....	12
3.1.2	Installation site.....	13
3.1.3	Refrigerant — in case of R410A or R32.....	14
3.1.4	Water.....	15
3.1.5	Electrical.....	16
3.1.6	Gas.....	17
3.1.7	Gas exhaust.....	18
3.1.8	Local legislation.....	18

### 3.1 For the installer

#### 3.1.1 General

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



#### **DANGER: RISK OF BURNING/SCALDING**

- 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**

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



#### **WARNING**

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



#### **WARNING**

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



#### **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**

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



#### **CAUTION**

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



**CAUTION**

- 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.

For Swiss market, domestic hot water operation should only be prepared in combination with a tank. Instant domestic hot water by the gas boiler is **NOT** allowed. Make the correct settings as described in this manual.

Please follow following Swiss regulations and directives:

- SVGW-gas principles G1 for gas installations,
- SVGW-gas principles L1 for liquid gas installations,
- cautional instances regulations (e.g., fire regulation).

### 3.1.2 Installation site

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

Module	Weight
Hybrid module	30 kg
Gas module	36 kg
Indoor part (Hybrid module + gas module)	Total weight: 66 kg

- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- Make sure the unit is level.
- If the wall on which the unit is mounted is flammable, a non-flammable material must be placed between the wall and the unit. Do the same for all locations through which the flue piping passes.
- ONLY** operate the gas boiler if a sufficient supply of combustion air is ensured. In case of a concentric air/flue gas system dimensioned according to the specifications of this manual, this is fulfilled automatically and there are no other conditions for the equipment installation room. This method of operation applies exclusively.
- Store flammable fluids and materials at least 1 meter away from the gas boiler.
- This gas boiler is **NOT** designed for room air dependent operation.

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.
- In bathrooms.
- In places where frost is possible. The ambient temperature around the gas boiler should be  $>5^{\circ}\text{C}$ .

#### 3.1.3 Refrigerant — in case of R410A or R32

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



#### **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**

During tests, NEVER pressurise 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 might be produced if refrigerant gas comes into contact with fire.



#### **WARNING**

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



#### **WARNING**

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

**Possible consequence:** Self-combustion and explosion of the compressor because of oxygen going into the operating compressor.

**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.

**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.

**NOTICE**

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

- In case recharge is required, see the nameplate or the refrigerant charge label of the unit. It states the type of refrigerant and necessary amount.
- Whether the unit is factory charged with refrigerant or non-charged, in both cases you might need to charge additional refrigerant, depending on the pipe sizes and pipe lengths of the system.
- 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.

## 3.1.4 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 2020/2184.

Avoid damages caused by deposits and corrosion. To prevent corrosion products and deposits, observe the applicable regulations of technology.

Measures for desalination, softening or hardness stabilization are necessary if the filling and top-up water have a high total hardness ( $>3$  mmol/l—sum of the calcium and magnesium concentrations, calculated as calcium carbonate).

Using filling water and top-up water which does NOT meet the stated quality requirements can cause a considerably reduced service life of the equipment. The responsibility for this is entirely that of the user.

#### 3.1.5 Electrical



#### DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 10 minutes, 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 national wiring regulations.
- 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 electrical 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.



#### WARNING

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

**CAUTION**

- When connecting the power supply: connect the earth cable first, before making the current-carrying connections.
- When disconnecting the power supply: disconnect the current-carrying cables first, before separating the earth connection.
- The length of the conductors between the power supply stress relief and the terminal block itself **MUST** be as such that the current-carrying wires are tautened before the earth wire is in case the power supply is pulled loose from the stress relief.

**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 meter away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 meter may NOT be sufficient.

**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.

### 3.1.6 Gas

The gas boiler is factory-set to:

- the type of gas quoted on the type identification plate or on the setting type identification plate,
- the gas pressure quoted on the type identification plate.

Operate the unit **ONLY** with the gas type and gas pressure indicated on these type identification plates.

Installation and adaptation of the gas system **MUST** be conducted by:

- personnel qualified for this work,
- in compliance with valid gas installation related guidelines,
- in accordance with applicable regulations of the gas supply company,
- In accordance with local and national regulations.

Boilers that use natural gas **MUST** be connected to a governed meter.

Boilers that use liquid petroleum gas (LPG) **MUST** be connected to a regulator.

The size of the gas supply pipe should under no circumstance be less than 22 mm.

The meter or regulator and pipe work to the meter **MUST** be checked preferably by the gas supplier. This is to ensure that the equipment works good and meets the gas flow and pressure requirements.



#### **DANGER**

If you smell gas:

- call immediately your local gas supplier and your installer,
- call the suppliers's number on the side of the LPG tank (if applicable),
- turn off the emergency control valve at the meter/regulator,
- do NOT turn electrical switches ON or OFF,
- do NOT strike matches or smoke,
- put out naked flames,
- open doors and windows immediately,
- keep people away from the affected area.

#### 3.1.7 Gas exhaust

Flue systems must **NOT** be modified or installed in any way other than as described in the fitting instructions. Any misuses or unauthorized modifications to the appliance, flue or associated components and systems could invalidate the warranty. The manufacturer accepts no liability arising from any such actions, excluding statutory rights.

It is **NOT** allowed to combine flue system parts purchased from different suppliers.

#### 3.1.8 Local legislation

See the local and national regulations.

##### **Local regulations for UK**

It is law that all gas appliances are installed by a gas safe registered competent engineer and in accordance with the following recommendations:

- Current Gas Safety (Installation and Use) Regulations
- All current building regulations
- Building Standards (Scotland) Consolidated
- This appliance **MUST** be installed in accordance with the Gas (Safety and Use) Regulations, current Building Regulations, Building Standards (Scotland), I.S.813 Installation of Gas Appliances (Ireland), IEE Wiring Regulations (BS 7671), Health and Safety Document No. 635 (Electricity at Work Regulations) and Local Water Authority Bye Laws
- UK Water Regulations and Bye Laws
- Health & Safety

The installation **MUST** comply with the following British Standards codes of practice:

- BS 5440-1: 2008 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases)
- BS 5440-2: 2009 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases)
- BS 5546: 2010 Specification for installation and maintenance of gas-fired water-heating appliances of rated input not exceeding 70 kW net
- BS 5549: 1990 Forced circulation hot water systems.

- BS 6700: 2006 + A1: 2009 Design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages - Specification
- BS 6798: 2014 Specification for selection, installation, inspection, commissioning, servicing and maintenance of gas-fired boilers of rated input not exceeding 70 kW net
- BS 6891: 2015 Specification for the installation and maintenance of low pressure gas installation pipework of up to 35 mm (R1¼) on premises
- BS 7593: 2006 Code of practice for treatment of water in domestic hot water space heating systems
- BS 7671: 2018 Requirements for electrical installations. IET wiring regulations
- BS 7074: 1 Code of practice for domestic and hot water supply
- EN12828: 2014 Space heating for domestic premises

Potable water: all seals, joints and compounds (including flux and solder) and components used as part of the secondary domestic water system MUST be approved by WRAS.

## 4 Specific installer safety instructions

Always observe the following safety instructions and regulations.

**About the box (see "5 About the box" [▶ 27])**



### WARNING

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

**Installation site (see "7.1 Preparing the installation site" [▶ 42])**



### WARNING

Follow the service space dimensions in this manual to install the unit correctly. See "7.1.1 Installation site requirements of the indoor unit" [▶ 42].



### WARNING

Make sure installation, servicing, maintenance and repair comply with instructions from Daikin and with applicable legislation (for example national gas regulation) and are executed ONLY by authorised persons.



### WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use means to accelerate the defrosting process or to clean the equipment, other than those recommended by the manufacturer.
- Be aware that R32 refrigerant does NOT contain an odour.



### WARNING

The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) and have a room size as specified below.



### WARNING

For units using the R32 refrigerant it is necessary to keep any required ventilation openings clear of obstructions.

**Opening and closing the units (see "7.2 Opening and closing the units" [▶ 49])**



### DANGER: RISK OF ELECTROCUTION

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

**Mounting the indoor unit (see "7.3 Mounting the indoor unit" [▶ 52])**



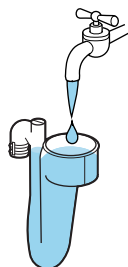
### WARNING

Fixing method of the indoor unit MUST be in accordance with the instructions from this manual. See "7.3 Mounting the indoor unit" [▶ 52].



**Mounting the gas boiler (see "7.4 Mounting the gas boiler" [► 54])****WARNING**

- ALWAYS fill the condensate trap with water and place it on the boiler before powering up the boiler. See illustration below.
- NOT placing or filling up the condensate trap may cause flue gases to come into the installation room and can lead to dangerous situations!
- In order to place the condensate trap, the front cover MUST be pulled forward or removed entirely.

**Connecting the boiler to the flue gas system (see "7.5 Connecting the boiler to the flue gas system" [► 57])****WARNING**

- Make sure that the socket connections of the flue and air supply duct materials are correctly sealed. Improper fastening of the flue and air supply duct can lead to hazardous situations or result in personal injury.
- Check all flue components for tightness.
- Secure the flue system to a rigid structure using appropriate clips. Refer to the instructions included in the box for more details about the concentric flue material. See "7.5.13 Placing brackets on the flue gas piping" [► 69] for more details about the dual pipe 80 mm flue and air intake connections.
- Do NOT use screws or parkers to mount the flue system as leakage can occur.
- Sealing rubbers can be negatively affected when grease is applied, use water instead.
- Do NOT mix any components, materials or ways of coupling from different manufacturers.

**CAUTION**

Read the installation manuals of the field supplied parts.

**CAUTION**

- Sealing rings should ONLY be moisturized with water before use. Do NOT use soap or other detergents.
- When installing flues in voids, make sure that they are connected and fixed correctly. If in an existing situation a visual inspection is NOT possible, the boiler must NOT be commissioned and remain disconnected from the gas supply until suitable access has been realised.
- Make sure to follow the manufacturer's instructions regarding maximum length of the flue system, the appropriate flue material, correct jointing methods and the maximum distance between flue support.
- Make sure that all joints and seams are gastight and watertight.
- Make sure that the flue system has a uniform gradient back to the boiler.



### WARNING

Failure to properly secure the flue gas pipes may cause the pipes to separate from the boiler module, causing the flue gas to enter the installation location. This could lead to CO poisoning of the residents.

### Piping installation (see "8 Piping installation" [▶ 77])



### WARNING

Field piping **MUST** be in accordance with the instructions from this manual. See "8 Piping installation" [▶ 77].



### DANGER: RISK OF BURNING/SCALDING



### NOTICE

- Use the flare nut fixed to the main unit.
- To prevent gas leakage, apply refrigeration oil only to the inside of the flare. Use refrigeration oil for R32 (**Example:** FW68DA, SUNISO Oil).
- Do NOT reuse joints.



### NOTICE

- Do NOT use mineral oil on flared part.
- Do NOT reuse piping from previous installations.
- NEVER install a drier to this R32 unit to guarantee its lifetime. The drying material may dissolve and damage the system.



### WARNING

Connect the refrigerant piping securely before running the compressor. If the refrigerant piping is NOT connected and the stop valve is open when the compressor is run, air will be sucked in. This will cause abnormal pressure in the refrigeration cycle, which may result in equipment damage and even injury.



### CAUTION

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



### WARNING: FLAMMABLE MATERIAL

The refrigerant inside this unit is mildly flammable.



### WARNING

- The refrigerant inside the unit is mildly flammable, but normally does NOT leak. If the refrigerant leaks in the room and comes in contact with fire from a burner, a heater, or a cooker, this may result in fire, or the formation of a harmful gas.
- Turn OFF any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.
- Do NOT use the unit until a service person confirms that the part from which the refrigerant leaked has been repaired.

**WARNING**

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use cleaning materials or means to accelerate the defrosting process other than those recommended by the manufacturer.
- Be aware that the refrigerant inside the system is odourless.

**WARNING**

- Only use R32 as refrigerant. Other substances may cause explosions and accidents.
- R32 contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 675. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, ALWAYS use protective gloves and safety glasses.

**NOTICE**

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

**DANGER: RISK OF BURNING/SCALDING**

In case of high leaving water setpoints for space heating (either a high fixed setpoint or a high weather-dependent setpoint at low ambient temperatures), the heat exchanger of the boiler can be heated up to temperatures higher than 60°C.

In case of a tapping demand, it is possible that a small volume of water tapping (<0.3 l) has a temperature higher than 60°C.

**Electrical installation (see "9 Electrical installation" [▶ 103])**
**DANGER: RISK OF ELECTROCUTION****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 shocks.
- 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, extension cords, or connections from a star system. They can cause overheating, electrical shocks 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 national wiring regulation.
- Make electrical connections to the fixed wiring.
- All components procured on-site and all electrical construction MUST comply with the applicable legislation.



### WARNING

ALWAYS use multicore cable for power supply cables.



### CAUTION

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



### CAUTION

For installation in damp rooms, a fixed connection is obligatory. When working on the electrical circuit ALWAYS isolate the electric supply.



### DANGER: RISK OF ELECTROCUTION

A fused spur or an unswitched socket MUST be located no more than 1 m from the appliance.

## Configuration (see "10 Configuration" [▶ 116])



### CAUTION

Make sure to activate the disinfection function when a third-party tank is installed.



### CAUTION

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



### CAUTION

Make 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.



### 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

Work on gas carrying parts may ONLY be carried out by a qualified competent person. ALWAYS comply with local and national regulations. The gas valve is sealed. In Belgium, any modifications to the gas valve MUST be performed by a certified representative of the manufacturer. For more information, contact your dealer.



### CAUTION

It is NOT possible to adjust the CO<sub>2</sub> percentage when test program H is running. When the CO<sub>2</sub> percentage deviates from the values in the table above, please contact your local service department.



### CAUTION

Work on gas carrying parts may ONLY be carried out by a qualified competent person.

**Commissioning (see "12 Commissioning" [▶ 168])****WARNING**

Commissioning **MUST** be in accordance with the instructions from this manual. See "12 Commissioning" [▶ 168].

**WARNING**

NEVER allow operation of a boiler if the flue gas pipe is NOT installed correctly. See "7.5.12 About securing the flue system" [▶ 69] and "7.5.13 Placing brackets on the flue gas piping" [▶ 69] for more details.

- Do NOT start up the boiler on a promise that it will be corrected later. Start it up only when the flue gas pipe is installed correctly.
- Check on already installed units if the piping is secured correctly. Adjust if required.

**Maintenance and service (see "14 Maintenance and service" [▶ 181])****DANGER: RISK OF ELECTROCUTION****DANGER: RISK OF BURNING/SCALDING****CAUTION**

Water coming out of the valve may be very hot.

**WARNING**

If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

**CAUTION**

- During maintenance, the front plate seal **MUST** be replaced.
- When assembling, check the other seals for damage, such as hardening, (hairline) fracture and discoloration.
- If necessary, place a new seal and check the correct positioning.
- If retarders are NOT or incorrectly fitted, it may lead to serious damage.

**Troubleshooting (see "15 Troubleshooting" [▶ 189])****DANGER: RISK OF ELECTROCUTION****DANGER: RISK OF BURNING/SCALDING****WARNING**

Prevent hazards due to inadvertent resetting of the thermal cut-out: power to 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.



### 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 shunt 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.



### WARNING

**Air purging heat emitters or collectors.** Before you purge air from heat emitters or collectors, check if an error or ⓘ is displayed on the home pages of the user interface.

- If not, you can purge air immediately.
- If yes, make sure that the room where you want to purge air is sufficiently ventilated. **Reason:** Refrigerant might leak into the water circuit, and subsequently into the room when you purge air from the heat emitters or collectors.

**Disposal** (see "16 Disposal" [▶ 203])



### 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.

## 5 About the box

Keep the following in mind:

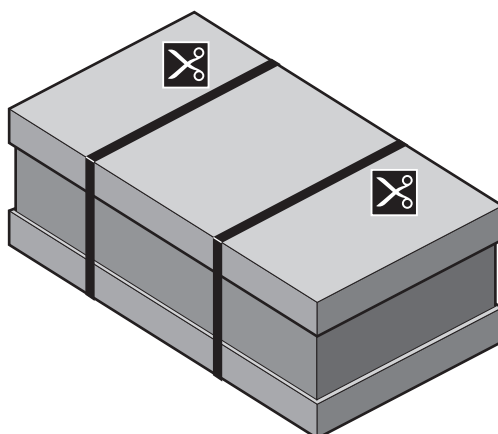
- At delivery, the unit **MUST** be checked for damage and completeness. Any damage or missing parts **MUST** be reported immediately to the claims agent of the carrier.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
- Prepare in advance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

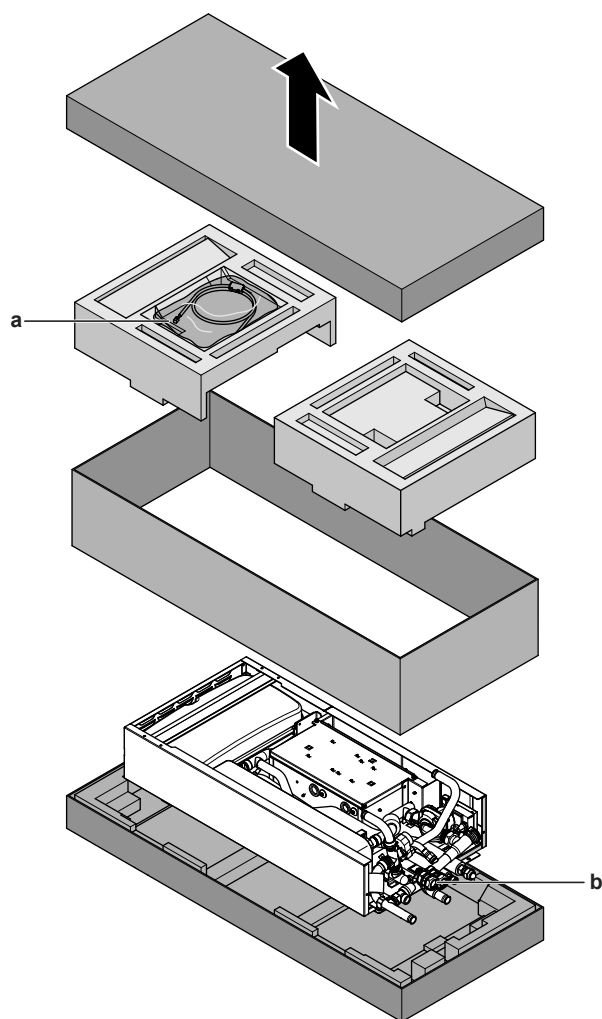
### In this chapter

5.1	Indoor unit .....	27
5.1.1	To unpack the indoor unit .....	27
5.1.2	To remove the accessories from the indoor unit .....	28
5.2	Gas boiler .....	29
5.2.1	To unpack the gas boiler .....	29
5.2.2	To remove the accessories from the gas boiler .....	30

### 5.1 Indoor unit

#### 5.1.1 To unpack the indoor unit





- a** Installation manual, operation manual, addendum book for optional equipment, quick installation guide, general safety precautions, boiler communication cable, reducer accessory set.
- b** Connection pieces for the gas boiler



#### INFORMATION

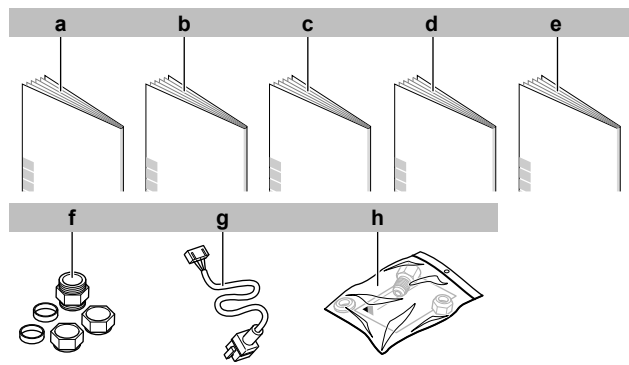
Do NOT throw away the upper cardboard cover. On the outside of the cardboard cover, the installation pattern is printed.

### 5.1.2 To remove the accessories from the indoor unit

- 1** Remove the accessories as described in ["5.1.1 To unpack the indoor unit"](#) [▶ 27].

The installation manual, operation manual, addendum book for optional equipment, general safety precautions, quick installation guide, boiler communication cable and reducer accessory set are located in the upper part of the box. The connection pieces for the gas boiler are attached to the water piping.



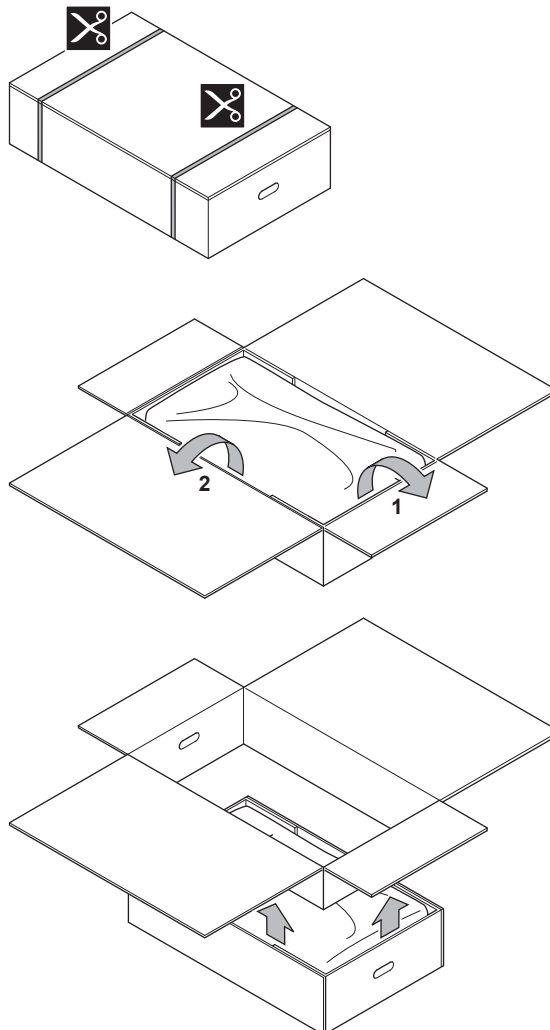


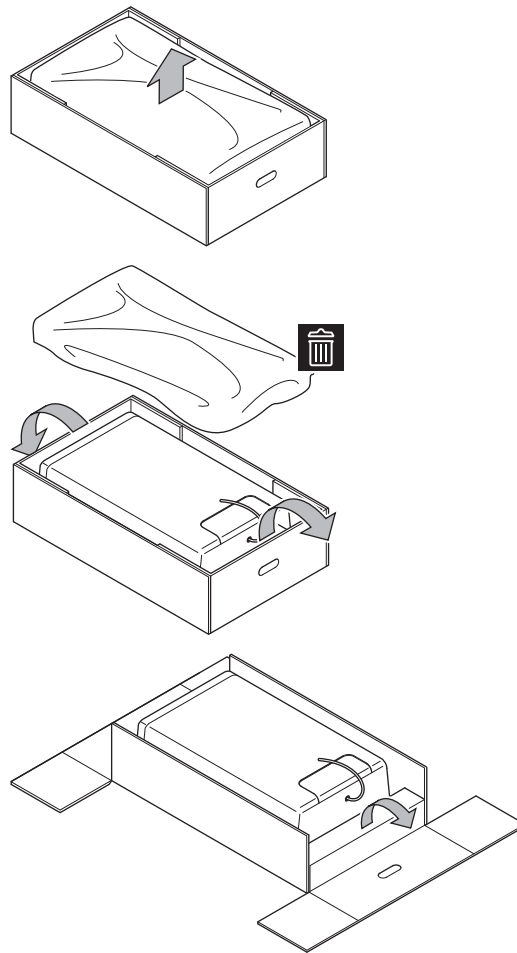
- a** General safety precautions
- b** Addendum book for optional equipment
- c** Indoor unit installation manual
- d** Operation manual
- e** Quick installation guide
- f** Connection pieces for gas boiler
- g** Boiler communication cable
- h** Reducer accessory set

## 5.2 Gas boiler

### 5.2.1 To unpack the gas boiler

Before unpacking, move the gas boiler as close as possible to its installation position.



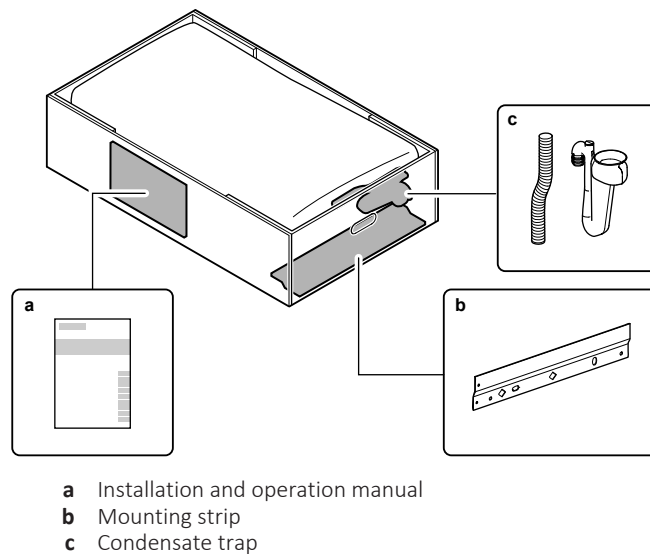


#### WARNING

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

### 5.2.2 To remove the accessories from the gas boiler

- 1 Remove the accessories.



## 6 About the units and options

### In this chapter

6.1	Identification.....	31
6.1.1	Identification label: Indoor unit .....	31
6.1.2	Identification label: Gas boiler .....	32
6.2	Combining units and options .....	33
6.2.1	Possible options for the indoor unit .....	33
6.2.2	Possible options for the gas boiler.....	35
6.2.3	Possible combinations of indoor unit and outdoor unit .....	41
6.2.4	Possible combinations of indoor unit and domestic hot water tank.....	41

### 6.1 Identification

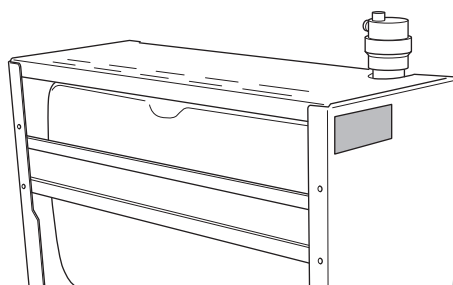


#### NOTICE

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

#### 6.1.1 Identification label: Indoor unit

##### Location



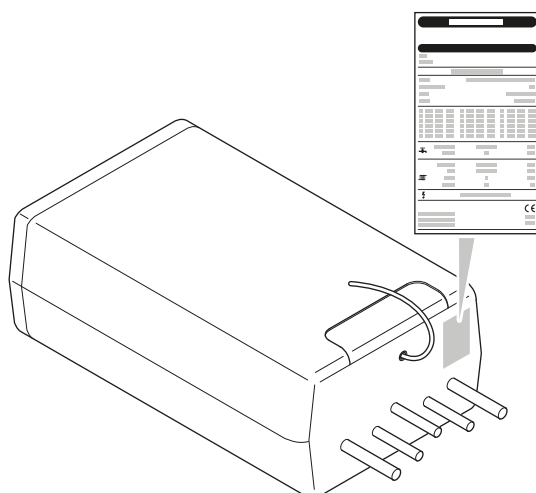
##### Model identification

**Example:** C HY HBH 05 AF V3

Code	Description
C	Residential multi compatible model
HY	Hybrid indoor unit
HBH	Hydrobox heating only
05	Capacity class
AF	Model series
V3	Power supply

### 6.1.2 Identification label: Gas boiler

#### Location



#### Model identification

	a	
b	No:	
c	Anno:	
	<b>Condensing boiler</b>	
d	Type:	
e	NOx classe:	
f	PIN:	
r	G.C.:	
s	SVGW:	
h		
g		
k	Q <sub>nw</sub> (net)	kW
l	PMW	bar
m	Q <sub>n</sub> (net)	kW
n	P <sub>n</sub>	kW
o	PMS	bar
p	T <sub>max</sub>	°C
q		
	CE	
	0063	
	2013	

- a Model
- b Serial number
- c Production year
- d Appliance type
- e NOx class
- f PIN number: notified body reference
- g Destination country
- h Gas type
- i Gas supply pressure (mbar)
- j Appliance category
- k Domestic hot water heat output (kW)
- l Maximum domestic hot water pressure (bar)
- m Heat output (space heating) (kW)
- n Nominal power (kW)
- o Maximum space heating pressure (bar)
- p Maximum flow temperature (°C)
- q Electrical supply
- r GCN gas council number
- s SVGW number

## 6.2 Combining units and options



### INFORMATION

Certain options may NOT be available in your country.

### 6.2.1 Possible options for the indoor unit

#### User interface (EKRUCBL\*)

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

The additional user interface can be connected:

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

Following user interfaces are available:

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

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

For installation instructions, see ["9.2.5 To connect the user interface"](#) [► 111].

#### 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, EKTR1, RTRNETA)

You can connect an optional room thermostat to the indoor unit. This thermostat can either be wired (EKRTWA) or wireless (EKTR1 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 the remote indoor temperature sensor (EKRTETS) only in combination with the wireless thermostat (EKTR1).

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

### Digital I/O PCB (EGRP1HBAA)

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

- Alarm output
- Space heating/cooling On/OFF output

For installation instructions, see the installation manual of the digital I/O PCB and the addendum book for optional equipment.

### Remote indoor sensor (KRCS01-1)

By default the internal user interface sensor will be used as room temperature sensor.

As an option the remote indoor sensor can be installed to measure the room temperature on another location.

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



#### INFORMATION

- The remote indoor sensor can only be used in case the user interface is configured with room thermostat functionality.
- You can only connect either the remote indoor sensor or the remote outdoor sensor.

### Remote outdoor sensor (EKRSOA1)

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.

### PC configurator (EKPCCAB4)

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

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

For installation instructions, see the installation manual of the PC cable and "10 Configuration" [► 116].

### Heat pump convector (FWXV)

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

### Solar kit (EKSRRPS3)

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

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

#### Domestic hot water tank

The domestic hot water tank can be connected to the indoor unit for providing domestic hot water. The polypropylene tank is available in 2 types:

- EKHWP300B: 300 l.
- EKHWP500B: 500 l.

Use the appropriate connection kit for the tank (EKEPHT3H), as described in the addendum book for optional equipment.

#### Connection kit for the tank (EKEPHT3H)

Use the connection kit to connect the domestic hot water tank to the indoor unit.

For installation instructions, see the installation manual of the connection kit.

#### Mounting kit (EKHYMNT1A, EKHYMNT2A, EKHYMNT3A)

Mounting fixture for easy installation of the hybrid system (heat pump module + gas boiler module). For the selection of the correct kit, see the combination table.

For installation instructions, see the installation manual of the mounting kit.

#### Filling loop kit (EKFL1A)

Filling loop for easy filling of the water circuit. This kit can only be used in combination with mounting kit EKHYMNT1A.

For installation instructions, see the installation manual of the filling loop kit.

#### Valve kit (EKVK1A, EKVK2A, EKVK3A)

A set of valves for the easy connection of the field piping. For the connection of the correct kit, see the combination table.

For installation instructions, see the installation manual of the valve kit.

#### Recirculation thermistor (EKTH2)

Kit for recirculating the water on the gas boiler. Only use this kit when there is no domestic hot water tank installed.

#### 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.

### 6.2.2 Possible options for the gas boiler

#### Main options

##### Boiler cover plate (EKHY093467)

Cover plate to protect the piping and valves of the gas boiler.

For installation instructions, see the installation manual of the cover plate.

##### Gas conversion kit G25 (EKPS076227)

Kit for the conversion of the gas boiler for use with gas type G25.

##### Gas conversion kit G31 (EKHY075787)

Kit for the conversion of the gas boiler for use with gas type G31 (propane).

**Dual pipe conversion kit (EKHY090707)**

Kit for the conversion of a concentric flue gas system to a dual pipe system.

For installation instructions, see the installation manual of the dual pipe conversion kit.

**80/125 concentric connection kit (EKHY090717)**














Kit for the conversion of 60/100 concentric flue gas connections to 80/125 concentric flue gas connections.

For installation instructions, see the installation manual of the concentric connection kit.












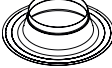
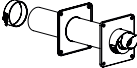





**Flue gas flap valve (EKFGF1A)**



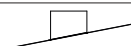
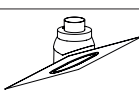
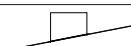




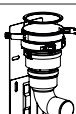
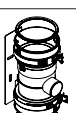
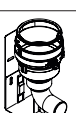
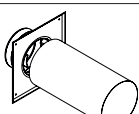

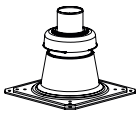

Non-return flap valve for use in multi-boiler flue gas systems. This valve can only be used in systems using natural gas (G20, G25), and CANNOT be used in systems using propane (G31).

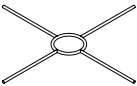






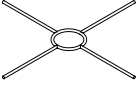



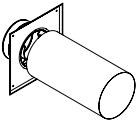

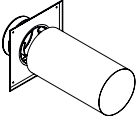
**Other options**








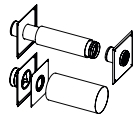
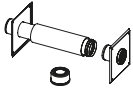







Accessories	Part number	Description
	EKFGP6837	Roof terminal PP/GLV 60/100 AR460
	EKFGS0518	Weather slate steep Pb/GLV 60/100 18°-22°
	EKFGS0519	Weather slate steep Pb/GLV 60/100 23°-17°
	EKFGP7910	Weather slate steep PF 60/100 25°-45°
	EKFGS0523	Weather slate steep Pb/GLV 60/100 43°-47°
	EKFGS0524	Weather slate steep Pb/GLV 60/100 48°-52°
	EKFGS0525	Weather slate steep Pb/GLV 60/100 53°-57°
	EKFGP1296	Weather slate flat Aluminium 60/100 0°-15°
	EKFGP6940	Weather slate flat Aluminium 60/100
	EKFGP2978	Wall terminal kit PP/GLV 60/100
	EKFGP2977	Wall terminal kit low profile PP/GLV 60/100
	EKFGP4651	Extension PP/GLV 60/100x500 mm
	EKFGP4652	Extension PP/GLV 60/100x1000 mm
	EKFGP4664	Elbow PP/GLV 60/100 30°



Accessories	Part number	Description
	EKFGP4661	Elbow PP/GLV 60/100 45°
	EKFGP4660	Elbow PP/GLV 60/100 90°
	EKFGP4667	Meas. tee with inspection panel PP/GLV 60/100
	EKFGP4631	Wall bracket Ø100
	EKFGP1292	Wall terminal Kit PP/GLV 60/100
	EKFGP1293	Wall terminal kit low profile PP/GLV 60/100
	EKFGP1294	Plume management kit 60 (UK only)
	EKFGP1295	Flue deflector 60 (UK only)
	EKFGP1284	PMK elbow 60 90 (UK only)
	EKFGP1285	PMK elbow 60 45° (2 pieces) (UK only)
	EKFGP1286	PMK extension 60 L=1000 includes bracket (UK only)
	EKFGW5333	Weather slate flat aluminium 80/125
	EKFGW6359	Wall terminal kit PP/GLV 80/125
	EKFGP4801	Extension PP/GLV 80/125×500 mm
	EKFGP4802	Extension PP/GLV 80/125×1000 mm
	EKFGP4814	Elbow PP/GLV 80/125 30°
	EKFGP4811	Elbow PP/ALU 80/125 45°
	EKFGP4810	Elbow PP/ALU 80/125 90°
	EKFGP4820	Inspection elbow Plus PP/ALU 80/125 90° EPDM

Accessories	Part number	Description
	EKFGP6864	Roof Terminal PP/GLV 80/125 AR300 RAL 9011
	EKFGT6300	Weather slate steep Pb/GLV 80/125 18°-22°
	EKFGT6301	Weather slate steep Pb/GLV 80/125 23°-27°
	EKFGP7909	Weather slate steep PF 80/125 25°-45° RAL 9011
	EKFGT6305	Weather slate steep Pb/GLV 80/125 43°-47°
	EKFGT6306	Weather slate steep Pb/GLV 80/125 48°-52°
	EKFGT6307	Weather slate steep Pb/GLV 80/125 53°-57°
	EKFGP1297	Weather slate flat aluminium 80/125 0°-15°
	EKFGP6368	Tee flex 100 boiler connection set 1
	EKFGP6354	Flex 100-60 + support elbow
	EKFGP6215	Tee flex 130 boiler connection set 1
	EKFGS0257	Flex 130-60 + support elbow
	EKFGP4678	Chimney connection 60/100
	EKFGP5461	Extension PP 60x500
	EKFGP5497	Chimney top PP 100 with included flue pipe
	EKFGP6316	Adapter flex-fixed PP 100

Accessories	Part number	Description
	EKFGP6337	Support bracket top inox Ø100
	EKFGP6346	Extension flex PP 100 L=10 m
	EKFGP6349	Extension flex PP 100 L=15 m
	EKFGP6347	Extension flex PP 100 L=25 m
	EKFGP6325	Connector flex-flex PP 100
	EKFGP5197	Chimney top PP 130 with included flue pipe
	EKFGS0252	Adapter flex-fixed PP 130
	EKFGP6353	Support bracket top inox Ø130
	EKFGS0250	Extension flex PP 130 L=130 m
	EKFGP6366	Connector flex-flex PP 130
	EKFGP1856	Flex kit PP Ø60-80
	EKFGP4678	Chimney connection 60/100
	EKFGP2520	Flex kit PP Ø80
	EKFGP4828	Chimney connection 80/125

Accessories	Part number	Description
	EKFGP6340	Extension Flex PP 80 L=10 m
	EKFGP6344	Extension Flex PP 80 L=15 m
	EKFGP6341	Extension Flex PP 80 L=25 m
	EKFGP6342	Extension Flex PP 80 L=50 m
	EKFGP6324	Connector-flex-flex PP 80
	EKFGP6333	Spacer PP 80-100
	EKFGP4481	Fixation Ø100
	EKFGV1101	Chimney connection 60/10 air intake Dn.80 C83
	EKFGV1102	Connection set 60/10-60 Flue/Air intake Dn.80 C53
	EKFGW4001	Extension P BM-Air 80×500
	EKFGW4002	Extension P BM-Air 80×1000
	EKFGW4004	Extension P BM-Air 80×2000
	EKFGW4085	Elbow PP BM-Air 80 90°
	EKFGW4086	Elbow PP BM-Air 80 45°
	EKGFP1289	Elbow PP/GALV 60/100 50°
	EKGFP1299	Kit horizontal low profile PP/GLV 60/100 (UK only)

**INFORMATION**

For extra configuration options regarding the flue gas system, visit <http://fluegas.daikin.eu/>.

**INFORMATION**

For the installation of the flue and air supply duct material, see the manual included with the materials. Contact the manufacturer of the relevant flue and air supply duct materials for extensive technical information and specific assembly instructions.

### 6.2.3 Possible combinations of indoor unit and outdoor unit

See the combination table in the technical engineering data.

### 6.2.4 Possible combinations of indoor unit and domestic hot water tank

Indoor unit	Domestic hot water tank
	EKHWP300B + EKHWP500B
CHYHBH05	O
CHYHBH08	O

# 7 Unit installation

## In this chapter

7.1	Preparing the installation site .....	42
7.1.1	Installation site requirements of the indoor unit .....	42
7.1.2	Special requirements for R32 units .....	44
7.1.3	Installation patterns .....	44
7.2	Opening and closing the units .....	49
7.2.1	About opening the units .....	49
7.2.2	To open the switch box cover of the indoor unit .....	49
7.2.3	To open the gas boiler .....	50
7.2.4	To open the switch box cover of the gas boiler .....	50
7.2.5	To close the indoor unit .....	51
7.2.6	To close the gas boiler .....	51
7.2.7	To install the gas boiler cover plate .....	52
7.3	Mounting the indoor unit .....	52
7.3.1	About mounting the indoor unit .....	52
7.3.2	Precautions when mounting the indoor unit .....	52
7.3.3	To install the indoor unit .....	52
7.4	Mounting the gas boiler .....	54
7.4.1	To install the gas boiler .....	54
7.4.2	To install the condensate trap .....	55
7.5	Connecting the boiler to the flue gas system .....	57
7.5.1	To change the gas boiler to 80/125 concentric connection .....	58
7.5.2	To change the 60/100 concentric connection to a dual pipe connection .....	58
7.5.3	Calculate the total piping length .....	59
7.5.4	Appliance categories and pipe lengths .....	60
7.5.5	Applicable materials .....	64
7.5.6	Flue pipe position .....	65
7.5.7	Insulation of the gas exhaust and air intake .....	67
7.5.8	Fitting a horizontal flue system .....	67
7.5.9	Fitting a vertical flue system .....	67
7.5.10	Plume management kit .....	67
7.5.11	Flues in voids .....	68
7.5.12	About securing the flue system .....	69
7.5.13	Placing brackets on the flue gas piping .....	69
7.6	Condensate pipe work .....	74
7.6.1	Internal connections .....	75
7.6.2	External connections .....	76

## 7.1 Preparing the installation site

Choose an installation location with sufficient space to transport the unit in and out of the 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.

### 7.1.1 Installation site requirements of the indoor unit



#### INFORMATION

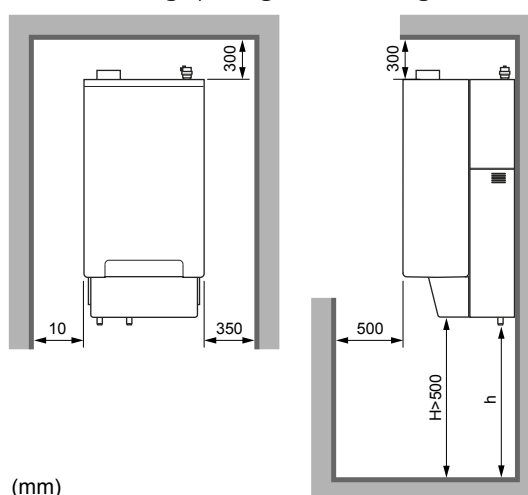
Also read the precautions and requirements in the "3 General safety precautions" [▶ 12].

- The indoor unit is designed for indoor installation only (in a technical room or similar) and for ambient temperatures ranging 5~30°C in heating mode.
- Mind the measurement guidelines:

Maximum refrigerant piping length between indoor unit and outdoor unit	25 m
Minimum refrigerant piping length between indoor unit and outdoor unit	3 m
Maximum height difference between indoor unit and outdoor unit	15 m
Maximum equivalent piping length between the 3-way valve and the indoor unit (for installations with domestic hot water tank)	3 m <sup>(a)</sup>
Maximum equivalent piping length between the domestic hot water tank and the indoor unit (for installations with domestic hot water tank)	10 m <sup>(a)</sup>

<sup>(a)</sup> Piping diameter 0.75".

- Mind the following spacing installation guidelines:



(mm)

- H** Distance measured from the floor to the bottom of the casing of the gas boiler (minimum 500 mm, and in case of a valve mounting kit: 800 mm).
- h** Distance measured from the floor to the flare nut of the refrigerant piping.

Additionally to the spacing guidelines: The room where you install the indoor unit must also comply with the conditions described in ["7.1.3 Installation patterns"](#) [▶ 44].

- Make sure the installation site withstands the total weight and vibration of the installation.

Module	Weight
Hybrid module	30 kg
Gas module	36 kg
Indoor part (Hybrid module + gas module)	Total weight: 66 kg

Do NOT install the unit in places such as:

- In places where a mineral oil mist, spray or vapour may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.
- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.
- In places with high humidity (max. RH=85%), for example a bathroom.
- In places where frost is possible. Ambient temperature around the indoor unit must be >5°C.

### 7.1.2 Special requirements for R32 units

Additionally to the spacing guidelines: The room where you install the indoor unit must also comply with the conditions described in ["7.1.3 Installation patterns"](#) [▶ 44].



#### WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use means to accelerate the defrosting process or to clean the equipment, other than those recommended by the manufacturer.
- Be aware that R32 refrigerant does NOT contain an odour.



#### WARNING

The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) and have a room size as specified below.



#### NOTICE

- Do NOT re-use joints and copper gaskets which have been used already.
- Joints made in the installation between parts of the refrigerant system shall be accessible for maintenance purposes.



#### WARNING

Make sure installation, servicing, maintenance and repair comply with instructions from Daikin and with applicable legislation (for example national gas regulation) and are executed ONLY by authorised persons.



#### NOTICE

- The pipework shall be securely mounted and guarded protected from physical damage.
- Keep the pipework installation to a minimum.

### 7.1.3 Installation patterns



#### WARNING

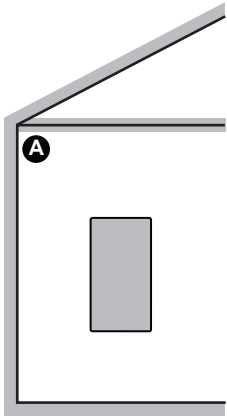
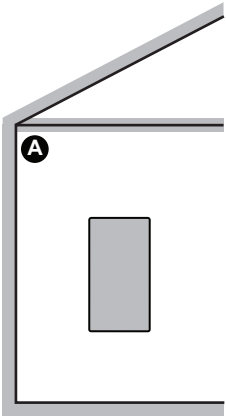
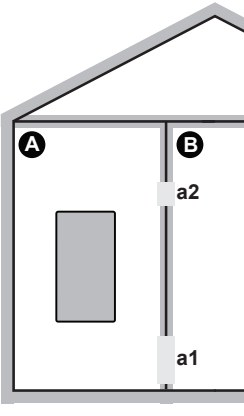
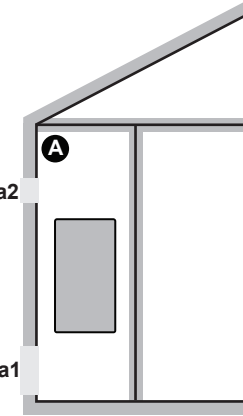
For units using the R32 refrigerant it is necessary to keep any required ventilation openings clear of obstructions.

Depending on the total refrigerant charge in the system and the type of room in which you install the indoor unit, different installation patterns are allowed:

If...		Then...
Total refrigerant charge in the system	Room type	Allowed patterns
<1.84 kg	All	1 (2, 3 and 4 are superfluous. There is no need to check the minimum floor area or to provide ventilation openings.)



If...		Then...
Total refrigerant charge in the system	Room type	Allowed patterns
≥1.84 kg	Living room, kitchen, garage, attic, basement, storage room	2, 3
	Technical room (i.e. room that is NEVER occupied by persons)	2, 3, 4

	PATTERN 1	PATTERN 2	PATTERN 3	PATTERN 4
				
Ventilation openings	N/A	N/A	Between room A and B	Between room A and outside
Minimum floor area	N/A	Room A	Room A + Room B	N/A
Restrictions	See "PATTERN 1" [▶ 45]	See "PATTERN 2 and 3" [▶ 45]		See "PATTERN 4" [▶ 47]

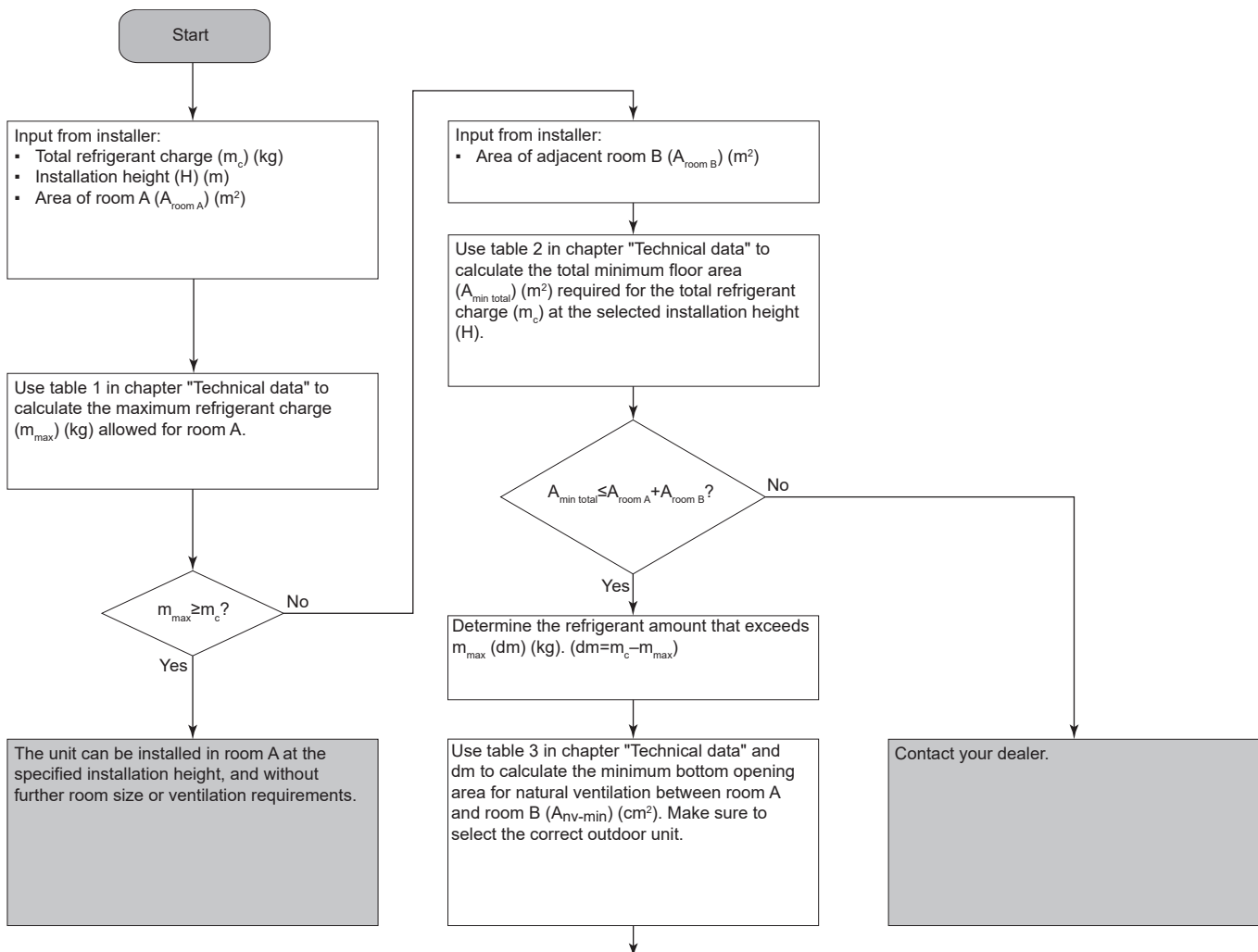
<b>A</b>	Room A (= room where indoor unit is installed)
<b>B</b>	Room B (= adjacent room)
<b>a1</b>	Bottom opening for natural ventilation
<b>a2</b>	Top opening for natural ventilation

### PATTERN 1

For PATTERN 1 you only need to comply with the spacing guidelines described in "7.1.1 Installation site requirements of the indoor unit" [▶ 42].

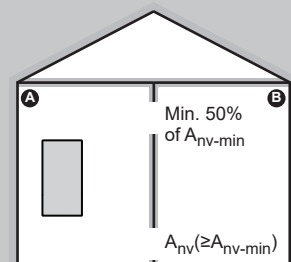
### PATTERN 2 and 3

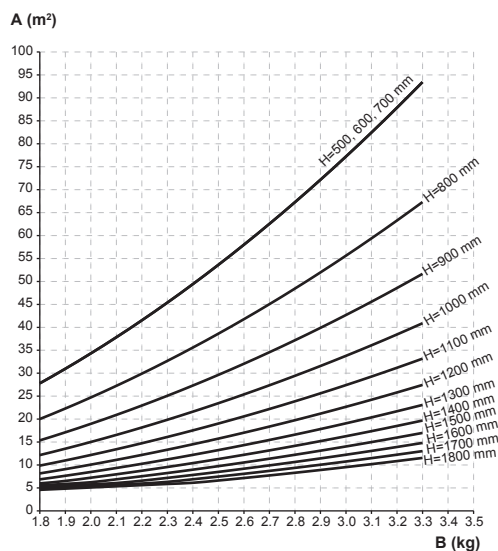
For PATTERN 2 and 3, additionally to the spacing guidelines described in "7.1.1 Installation site requirements of the indoor unit" [▶ 42], you also need to comply with the minimum floor area requirements as described in the following flow chart. The flow chart uses the following tables: "17.4 Table 1 – Maximum refrigerant charge allowed in a room: indoor unit" [▶ 213], "17.5 Table 2 – Minimum floor area: indoor unit" [▶ 215] and "17.6 Table 3 – Minimum bottom opening area for natural ventilation: indoor unit" [▶ 216].



Unit can be installed in **room A** if you provide 2 openings (one at the bottom, one at the top) between room A and B to ensure natural ventilation. The openings must comply with the following conditions:

- **Bottom opening (A<sub>nv</sub>):**
  - Must be a permanent opening that cannot be closed.
  - Must be completely located between 0 and 300 mm from the floor.
  - Must be ≥ A<sub>nv-min</sub> (minimum bottom opening area).
  - ≥ 50% of the required opening area A<sub>nv-min</sub> must be ≤ 200 mm from the floor.
  - The bottom of the opening must be ≤ 100 mm from the floor.
  - If the opening starts from the floor, the height of the opening must be ≥ 20 mm.
- **Top opening:**
  - Must be a permanent opening that cannot be closed.
  - Must be ≥ 50% of A<sub>nv-min</sub> (minimum bottom opening area).
  - Must be ≥ 1.5 m from the floor.

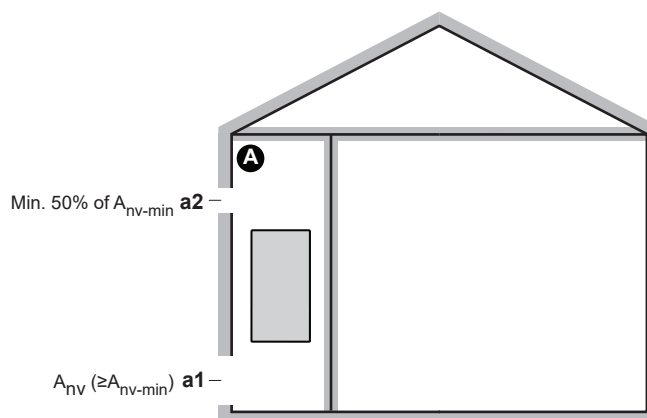




- A** Minimum floor area for hybrid unit ( $m^2$ )  
**B** Total refrigerant charge in the system ( $kg$ )  
**H** The height measured from the floor to the bottom of the casing. The graph is based on the height measured from the floor to the flare nut.

#### PATTERN 4

PATTERN 4 is only allowed for installations in technical rooms (i.e. room that is NEVER occupied by persons). For this pattern there are no requirements to the minimum floor area if you provide 2 openings (one at the bottom, one at the top) between the room and the outside to ensure natural ventilation. The room must be protected from frost.



- |          |  |
|----------|--|
| <b>A</b> | Unoccupied room where the indoor unit is installed.<br>Must be protected from frost. |
|----------|--|

<b>a1</b>	<p><math>A_{nv}</math>: <b>Bottom opening</b> for natural ventilation between the unoccupied room and the outside.</p> <ul style="list-style-type: none"> <li>▪ Must be a permanent opening that cannot be closed.</li> <li>▪ Must be above ground level.</li> <li>▪ Must be completely located between 0 and 300 mm from the floor of the unoccupied room.</li> <li>▪ Must be <math>\geq A_{nv-min}</math> (minimum bottom opening area as specified in the table below).</li> <li>▪ <math>\geq 50\%</math> of the required opening area <math>A_{nv-min}</math> must be <math>\leq 200</math> mm from the floor of the unoccupied room.</li> <li>▪ The bottom of the opening must be <math>\leq 100</math> mm from the floor of the unoccupied room.</li> <li>▪ If the opening starts from the floor, the height of the opening must be <math>\geq 20</math> mm.</li> </ul>
<b>a2</b>	<p><b>Top opening</b> for natural ventilation between room A and the outside.</p> <ul style="list-style-type: none"> <li>▪ Must be a permanent opening that cannot be closed.</li> <li>▪ Must be <math>\geq 50\%</math> of <math>A_{nv-min}</math> (minimum bottom opening area as specified in the table below).</li> <li>▪ Must be <math>\geq 1.5</math> m from the floor of the unoccupied room.</li> </ul>

#### $A_{nv-min}$ (minimum bottom opening area for natural ventilation)

The minimum bottom opening area for natural ventilation between the unoccupied room and the outside depends on the total refrigerant in the system. For intermediate refrigerant charges, use the row with the higher value. **Example:** If the refrigerant charge is 4.3 kg, use the row of 4.4 kg.

Total refrigerant charge (kg)	$A_{nv-min}$ (dm <sup>2</sup> )
2	7.2
2.2	7.5
2.4	7.8
2.6	8.2
2.8	8.5
3	8.8
3.2	9.1
3.4	9.3
3.6	9.6
3.8	9.9
4	10.1
4.2	10.4
4.4	10.6
4.6	10.9
4.8	11.1
5	11.3
5.2	11.5
5.4	11.8

Total refrigerant charge (kg)	A <sub>nv-min</sub> (dm <sup>2</sup> )
5.6	12.0
5.8	12.2

## 7.2 Opening and closing 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

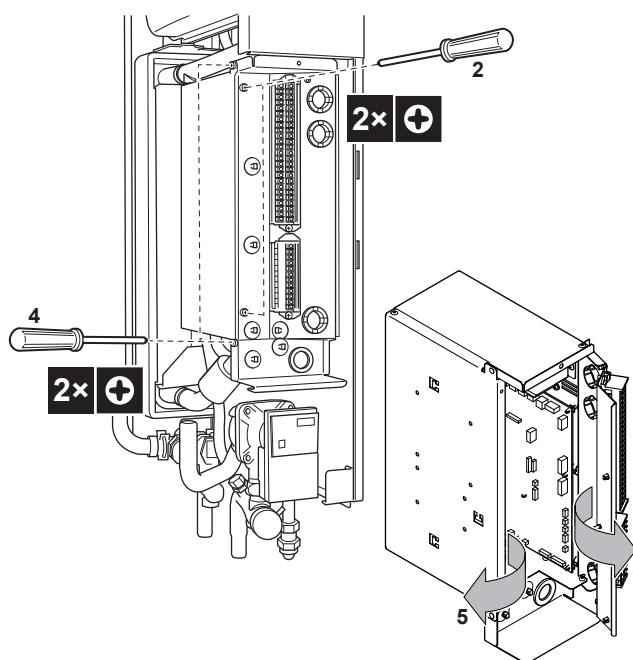


#### **DANGER: RISK OF ELECTROCUTION**

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

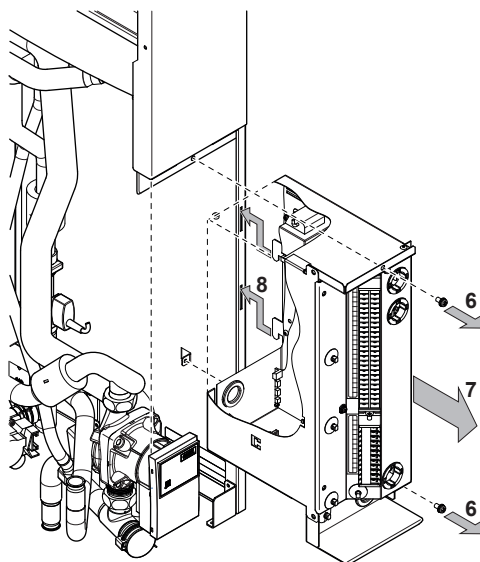
### 7.2.2 To open the switch box cover of the indoor unit

- 1 Remove the side panel at the right side of the indoor unit. The side panel is fixed at the bottom with 1 screw.
- 2 Remove the upper and lower screw on the side panel of the switch box.
- 3 The right panel of the switch box will open.
- 4 Remove the upper and lower screw on the front panel of the switch box.
- 5 The front panel of the switch box will open.

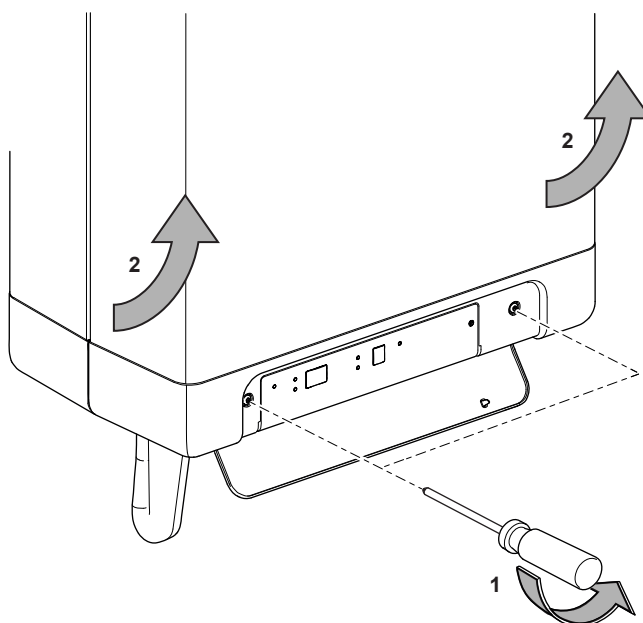


When the boiler is installed and access to the switch box is required, please follow the steps below.

- 6 Remove the upper and lower screw on the side panel of the switch box.
- 7 Remove the switch box from the unit.
- 8 Hook the switch box to the side of the unit with the hooks foreseen on the switch box.



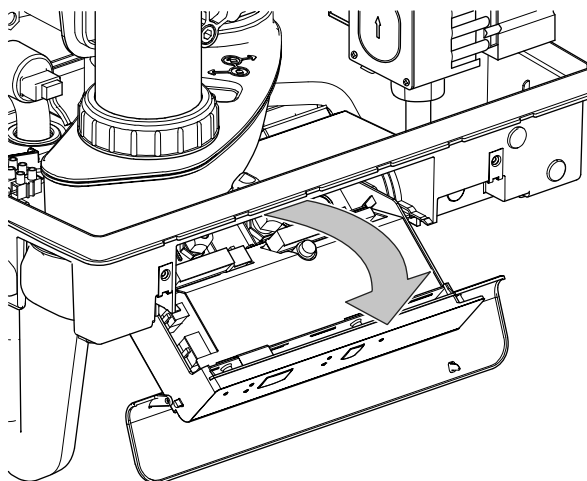
### 7.2.3 To open the gas boiler



- 1 Open the display cover.
- 2 Unscrew both screws.
- 3 Tilt the front panel towards you and remove the front panel.

### 7.2.4 To open the switch box cover of the gas boiler

- 1 Open the gas boiler, see "[7.2.3 To open the gas boiler](#)" [[▶ 50](#)].
- 2 Pull the boiler controller unit forwards. The boiler controller will tip downwards to provide access.



### 7.2.5 To close the indoor unit

- 1 Close the switch box.
- 2 Mount the side plate to the unit.
- 3 Mount the top plate.



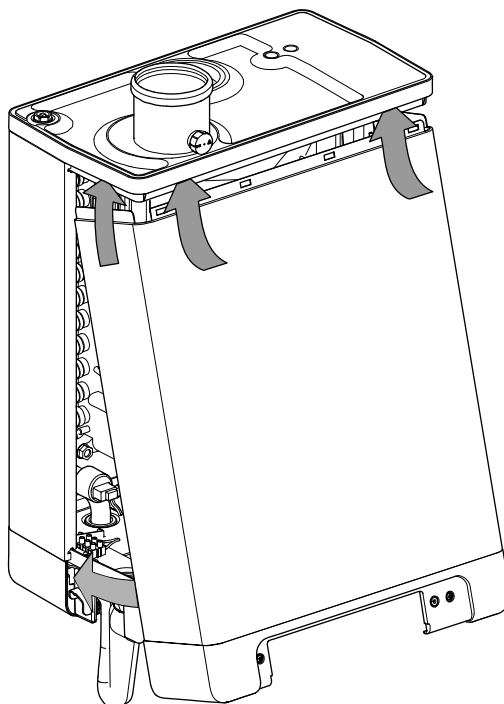
#### NOTICE

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

Before doing the configuration of the heat pump module, make sure that the hybrid module and gas boiler are installed correctly.

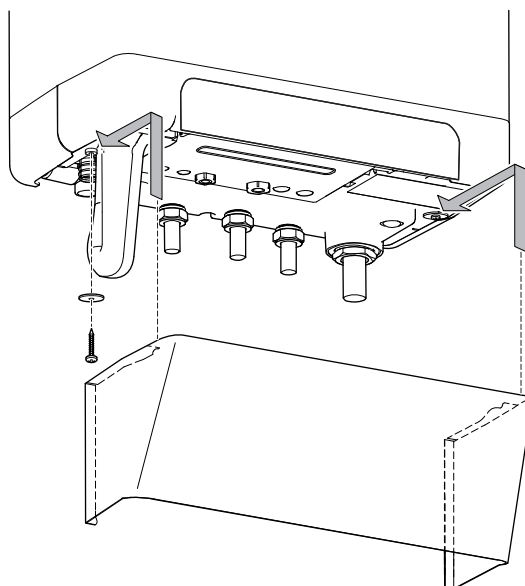
### 7.2.6 To close the gas boiler

- 1 Hook the top of the front panel into the top of the gas boiler.



- 2 Tilt the bottom side of the front panel towards the gas boiler.
- 3 Screw both screws of the cover.
- 4 Close the display cover.

### 7.2.7 To install the gas boiler cover plate



The boiler cover plate is an optional product.

## 7.3 Mounting the indoor unit

### 7.3.1 About mounting the indoor unit

#### When

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

#### Typical workflow

Mounting the indoor unit typically consists of the following stages:

- 1 Installing the indoor unit.

### 7.3.2 Precautions when mounting the indoor unit



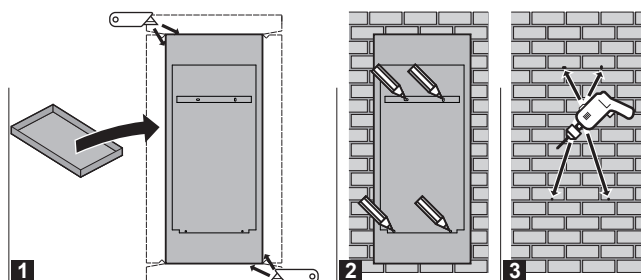
#### INFORMATION

Also read the precautions and requirements in the following chapters:

- "3 General safety precautions" [▶ 12]
- "7.1 Preparing the installation site" [▶ 42]

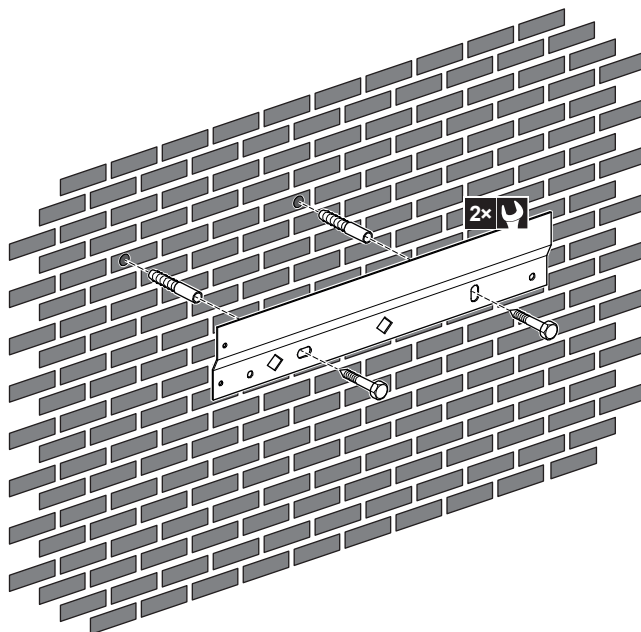
### 7.3.3 To install the indoor unit

- 1 Put the installation pattern (see box) on the wall and follow the steps as shown below.

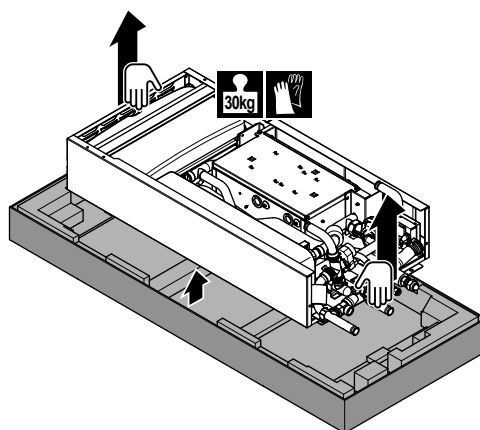


- 2 Fix the wall bracket to the wall with 2 M8 bolts.

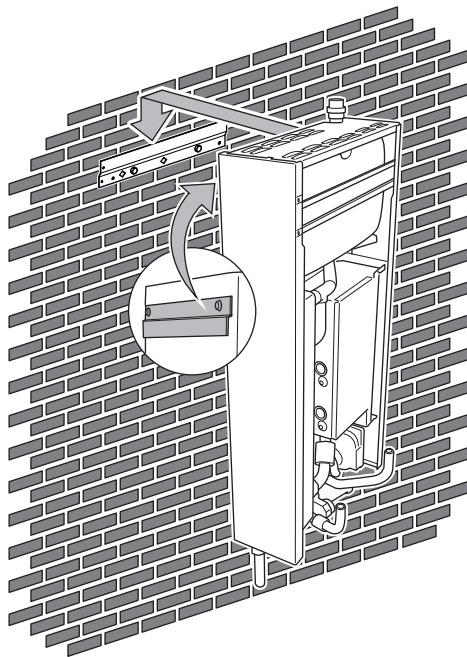




**3** Lift the unit.



- 4** Tilt the top of the unit against the wall at the position of the wall bracket.
- 5** Slide the bracket on the back of the unit over the wall bracket. Make sure the unit is fixed properly. It is strongly recommended to fix the bottom side of the unit with 2 M8 bolts and use spacers.
- 6** The unit is mounted to the wall.



## 7.4 Mounting the gas boiler

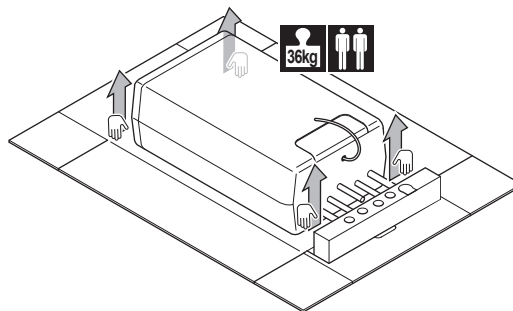


### INFORMATION

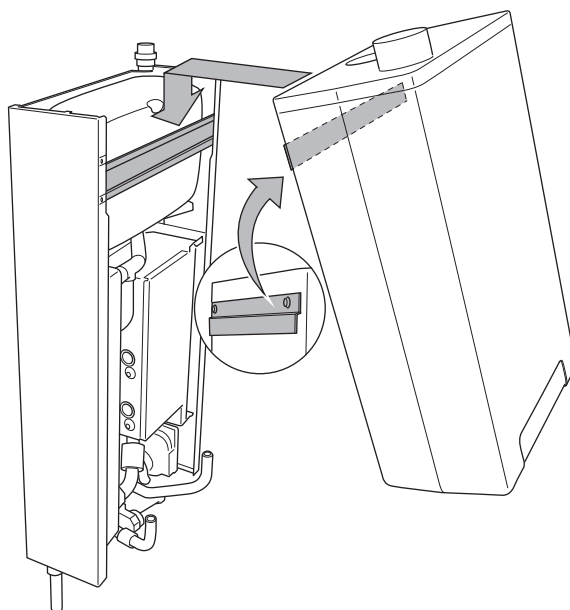
Removing the top plate of the indoor unit makes it easier to install the gas boiler.

#### 7.4.1 To install the gas boiler

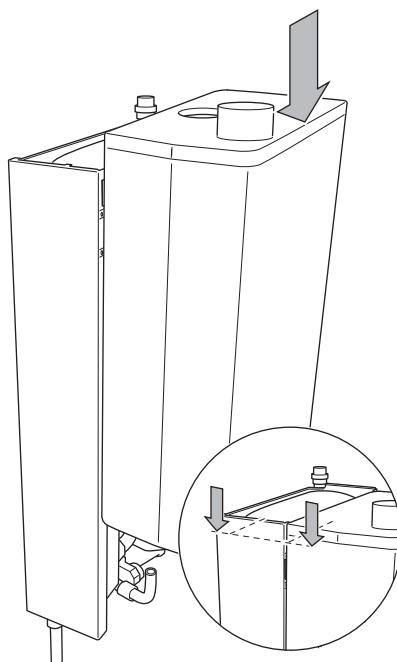
- 1 Lift the unit from the package.



- 2 Remove the top plate from the indoor unit.
- 3 The bracket to mount the boiler on the heat pump module is already mounted to the backside of the gas boiler.
- 4 Lift the boiler. One person lifts the gas boiler on the left side (left hand on the top and right hand on the bottom) and another person lifts the gas boiler on the right side (left hand on the bottom and right hand on the top).
- 5 Tilt the top of the unit at the position of the indoor unit mounting bracket.



- 6 Slide the boiler downwards to fix the boiler bracket onto the indoor unit mounting bracket.



- 7 Make sure the gas boiler is fixed properly and well aligned with the indoor unit.

#### 7.4.2 To install the condensate trap

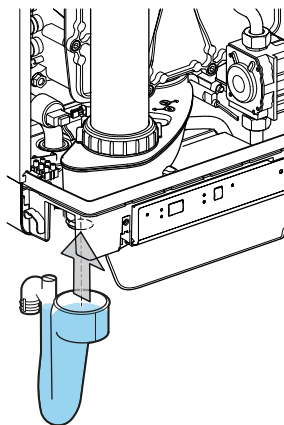


#### INFORMATION

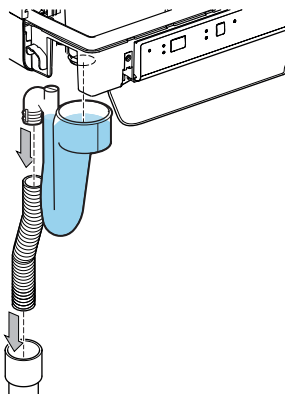
The boiler is provided with a Ø25 mm flexible pipe on the condensate trap.

**Prerequisite:** The boiler MUST be opened before installing the condensate trap.

- 1 Fit the flexible tube (accessory) to the condensate trap outlet.
- 2 Fill the condensate trap with water.
- 3 Slide the condensate trap as far as possible upwards onto the condensate drain connector below the gas boiler.

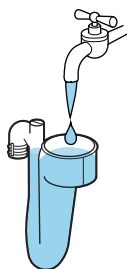


- 4** Connect the flexible tube (where applicable with the overflow pipe from the pressure relief valve) to the drain via an open connection.



### WARNING

- ALWAYS fill the condensate trap with water and place it on the boiler before powering up the boiler. See illustration below.
- NOT placing or filling up the condensate trap may cause flue gases to come into the installation room and can lead to dangerous situations!
- In order to place the condensate trap, the front cover MUST be pulled forward or removed entirely.



### NOTICE

It is recommended that any external condensate pipe is insulated and increased to Ø32 mm in order to prevent the condensate from freezing.

## 7.5 Connecting the boiler to the flue gas system



### WARNING

- Make sure that the socket connections of the flue and air supply duct materials are correctly sealed. Improper fastening of the flue and air supply duct can lead to hazardous situations or result in personal injury.
- Check all flue components for tightness.
- Secure the flue system to a rigid structure using appropriate clips. Refer to the instructions included in the box for more details about the concentric flue material. See "7.5.13 Placing brackets on the flue gas piping" [▶ 69] for more details about the dual pipe 80 mm flue and air intake connections.
- Do NOT use screws or parkers to mount the flue system as leakage can occur.
- Sealing rubbers can be negatively affected when grease is applied, use water instead.
- Do NOT mix any components, materials or ways of coupling from different manufacturers.

The gas boiler is designed ONLY for operation independent of room air.

The gas boiler is delivered with a 60/100 concentric flue gas/air intake connection. Fit the concentric pipe carefully in the adapter. The built-in gaskets ensure there is an air tight seal.

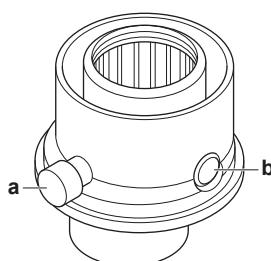
An adapter piece 80/125 concentric connection is also available. Fit the concentric pipe carefully in the adapter. The built-in gaskets ensure there is an air tight seal.



### INFORMATION

Carefully follow the instructions as described in the adapter set.

The concentric adapter piece is equipped with a measuring point for the gas exhaust and one for the air intake.



- a** Gas exhaust measuring point
- b** Air intake measuring point

The air supply and the flue pipe can also be connected separately as a dual pipe connection. An option to change the gas boiler from a concentric to a dual pipe connection is available.



### NOTICE

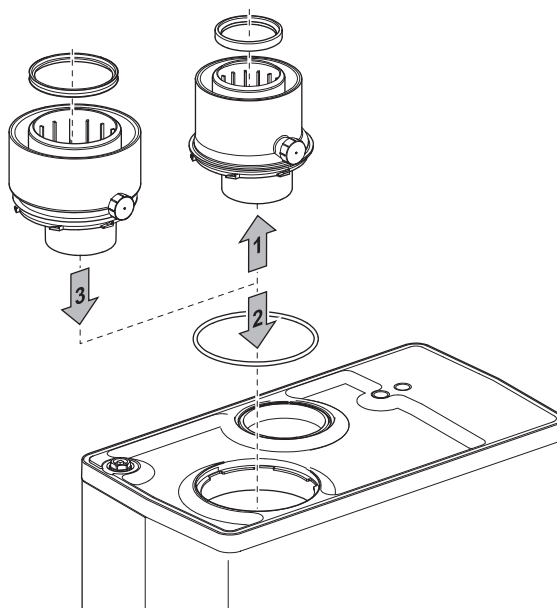
When installing the gas exhaust take the installation of the outdoor unit into account. Make sure the exhaust gases are not sucked into the evaporator.

When installing the gas exhaust and the air intake, take into account the serviceability of the indoor unit. When the gas exhaust/air intake goes backwards over the indoor unit, the expansion vessel cannot be accessed and, if necessary, will have to be replaced outside the unit.

### 7.5.1 To change the gas boiler to 80/125 concentric connection

The concentric connection can be changed from Ø60/100 to Ø80/125 by an adapter set.

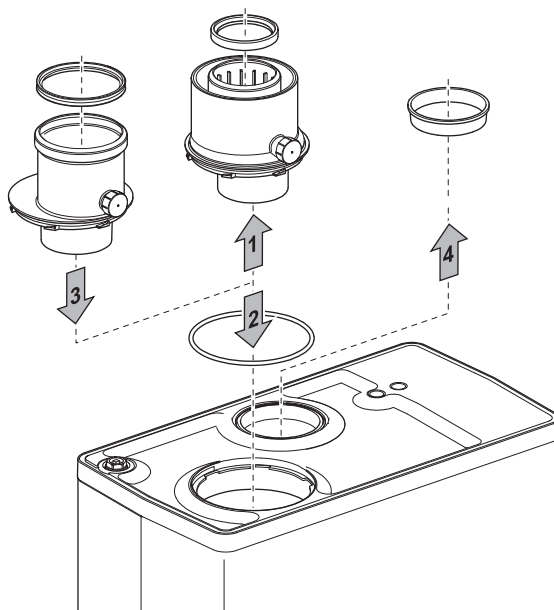
- 1** Remove the concentric pipe from the air supply and combustion gas pipe at the top of the gas boiler by turning counterclockwise.
- 2** Remove the O-ring from the concentric pipe and fit it around the flange of the concentric adapter Ø80/125.
- 3** Place the concentric adapter in the top of the appliance and turn it clockwise so that the measurement nipple points straight forward.
- 4** Fit the concentric pipe for the air supply and combustion gas flue into the adapter. The integral sealing ring ensures an airtight connection.
- 5** Check the connection of the internal flue pipe and the condensate collector. Make sure it is properly connected.



### 7.5.2 To change the 60/100 concentric connection to a dual pipe connection

The concentric connection can be changed from Ø60/100 to a dual pipe connection 2x Ø80 by an adapter set.

- 1** Remove the concentric pipe from the air supply and combustion gas pipe at the top of the gas boiler by turning counterclockwise.
- 2** Remove the O-ring from the concentric pipe and fit it around the flange of the dual pipe adapter Ø80.
- 3** Place the combustion gas connection (Ø80) in the top of the appliance and turn it clockwise so that the measurement nipple points straight forward. The integral sealing ring ensures an airtight connection.
- 4** Remove the lid from the air supply connection. Make sure to properly connect the air intake.
- 5** Fit the pipes for the air supply and flue gas carefully in the air inlet opening and flue gas adapter of the unit. The built-in gaskets ensure there is an air tight seal. Make sure that the connections are not mixed.
- 6** Check the connection of the internal flue pipe and the condensate collector. Make sure it is properly connected.

**INFORMATION**

Carefully follow the instructions as described in the adapter set.

### 7.5.3 Calculate the total piping length

When the resistance of the flue pipe and air supply pipe increase, the appliance power will decrease. The maximum permitted reduction in power is 5%.

The resistance of the air supply pipe and combustion gas flue depends on:

- the length,
- the diameter,
- all components (bends, elbows,...).

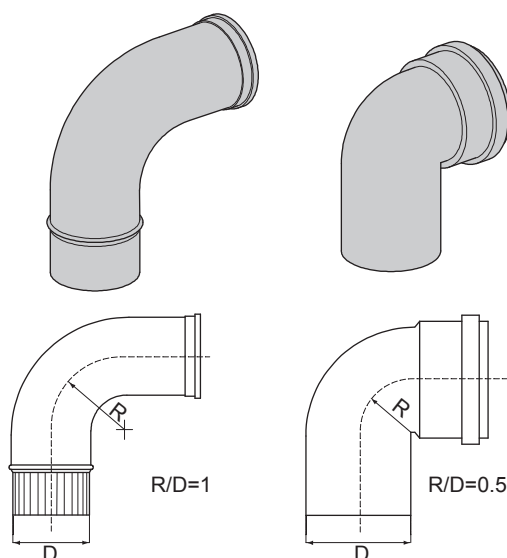
The total permitted pipe length of the air supply and the combustion gas flue is indicated for each appliance category.

#### Equivalent length for concentric installation (60/100)

	Length (m)
Bend 90°	1.5
Bend 45°	1

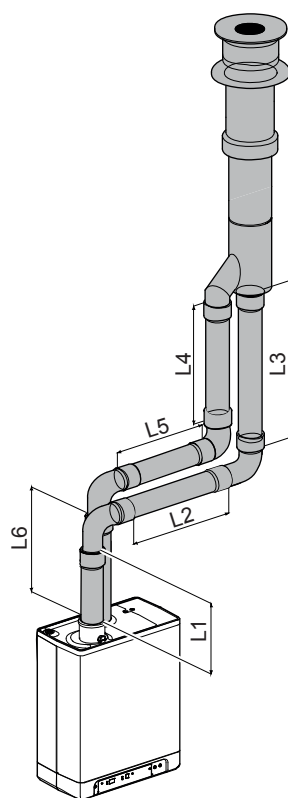
#### Equivalent length for dual pipe installation

		Length (m)
R/D=1	Bend 90°	2 m
	Bend 45°	1 m
R/D=0.5	Elbow 90°	4 m
	Elbow 45°	2 m



For a dual pipe connection, all defined lengths assume a diameter of 80 mm.

#### Sample calculation for dual pipe application



Pipe	Pipe length	Total pipe length
Flue pipe	$L1+L2+L3+(2 \times 2)$ m	13 m
Air supply	$L4+L5+L6+(2 \times 2)$ m	12 m

Total piping length = sum of the straight pipe lengths + sum of the equivalent pipe length of bends/elbows.

#### 7.5.4 Appliance categories and pipe lengths

Following installation methods are supported by the manufacturer.



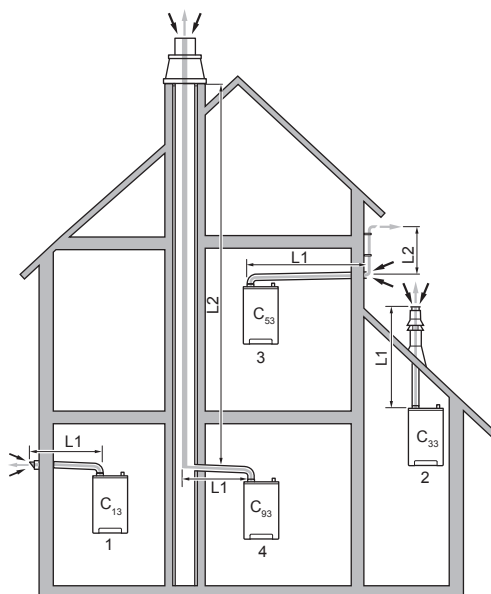
### Single boiler installation

Please note that NOT all flue gas configurations as described below are allowed in all countries. Please follow the local and national regulations.



#### INFORMATION

All piping lengths in the tables below are maximum equivalent piping lengths.



#### INFORMATION

The above installation examples are just examples and can differ on some details.

### Explanation of the flue systems

#### Category in accordance with CE

C <sub>13</sub>	Horizontal flue system. Discharge in the outside wall. Inlet opening for the air supply is in the same pressure zone as the discharge.	For example: a wall terminal through the façade.
C <sub>33</sub>	Vertical flue system. Flue gas discharge via the roof. Inlet opening for the air supply is in the same pressure zone as the discharge.	For example: a vertical roof terminal.
C <sub>43</sub>	Joint air supply and flue gas discharge duct (CLV system). Twin pipe or concentric.	—
C <sub>53</sub>	Separate air supply and separate flue gas discharge duct. Discharge into different pressure zones.	—
C <sub>63</sub>	Free in the market available flue material with CE approval.	Do NOT mix flue materials from different suppliers.
C <sub>83</sub>	Joint air supply and flue gas discharge duct (CLV system). Discharging into different pressure zones.	Only as twin pipe system.
C <sub>93</sub>	Air supply and flue gas discharge duct in shaft or ducted: concentric. Air supply from existing duct. Flue gas discharge via the roof. Air supply and flue gas discharge are in the same pressure zone.	Concentric flue system between the gas boiler and the duct.

**INFORMATION**

- In case of a C<sub>43</sub> or C<sub>83</sub> type flue gas system, a flue gas flap valve (EKFGF1A) MUST be installed.
- In case of installations which include wall terminals and/or flue pipes longer than 2 m, a flue gas flap valve (EKFGF1A) is recommended.

The horizontal flue MUST be installed under a 3° fall towards the boiler (50 mm per metre) and MUST be supported with a minimum of 1 bracket at each meter length. Best recommended position of the bracket is just before the joint.

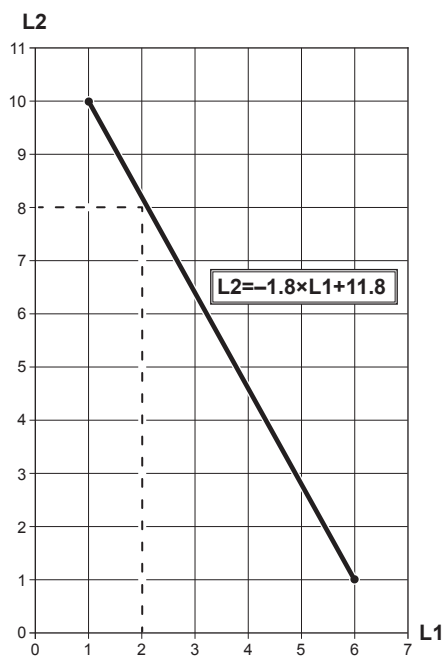
**INFORMATION**

Flexible flue gas lines may NOT be used in horizontal connection sections.

C <sub>13</sub> (1)	C <sub>33</sub> (2)	C <sub>13</sub> (1)	C <sub>33</sub> (2)
60/100	60/100	Twin-80	Twin-80
L1 (m)	L1 (m)	L1 (m)	L1 (m)
10	10	80	21

C <sub>13</sub> (1)	C <sub>33</sub> (2)	C <sub>93</sub> (4)		C <sub>53</sub> (3)	
80/125	80/125	80/125	80	60/100	60
L1 (m)	L1 (m)	L1 (m)	L2 (m)	L1 (m)	L2 (m)
29	29	10	25	6	1
				1	10

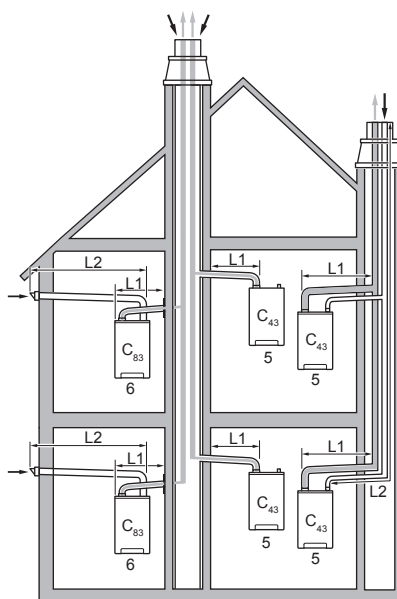
**Special remark regarding C<sub>53</sub>:** The maximum lengths for L1 and L2 are related to each other. First determine the length of L1; then make use of the graph below to determine the maximum length of L2. For example: if the length of L1 is 2 m, L2 can maximally be 8 m long.



## Multi-boiler installation

**INFORMATION**

All piping lengths in the tables below are maximum equivalent piping lengths.



The horizontal flue **MUST** be installed under a 3° fall towards the boiler (50 mm per metre) and **MUST** be supported with a minimum of 1 bracket at each meter length. Best recommended position of the bracket is just before the joint.

**INFORMATION**

Flexible flue gas lines may **NOT** be used in horizontal connection sections.

**INFORMATION**

The maximum lengths in the table below apply to each gas boiler separately.

<b>C<sub>83</sub> (6)</b>	<b>C<sub>43</sub> (5)</b>		
<b>Twin-80</b>	<b>60/100</b>	<b>80/125</b>	<b>Twin-80</b>
<b>L1+L2 (m)</b>	<b>L1 (m)</b>	<b>L1 (m)</b>	<b>L1+L2 (m)</b>
80	10	29	80

**Special remark regarding C<sub>83</sub>:** See the table below for the minimum diameters of the combined gas exhaust system.

<b>Number of units</b>	<b>Minimum Ø</b>
2	130
3	150
4	180
5	200
6	220
7	230
8	250
9	270

Number of units	Minimum Ø
10	280
11	290
12	300

**Special remark regarding C<sub>43</sub>:** See the table below for the minimum diameters of the combined gas exhaust/air intake system.

Number of units	Concentric		Dual pipe	
	Gas exhaust	Air intake	Gas exhaust	Air intake
2	161	302	161	255
3	172	322	172	272
4	183	343	183	290
5	195	366	195	309
6	206	386	206	326
7	217	407	217	344
8	229	429	229	363
9	240	449	240	380
10	251	470	251	398
11	263	493	263	416
12	274	513	274	434
13	286	536	286	453
14	297	556	297	470
15	308	577	308	488
16	320	599	320	507
17	331	620	331	524
18	342	641	342	541
19	354	663	354	560
20	365	683	365	578

**Special remark regarding C<sub>93</sub>:** The minimum inner dimensions of the chimney have to be 200×200 mm.



#### INFORMATION

In case of a C<sub>13</sub> type flue gas system, a flue gas flap valve (EKFGF1A) is recommended.

### 7.5.5 Applicable materials

Materials for the installation of the gas exhaust and/or air intake **MUST** be bought according to the table below.

	D	BG	BA	IT	HR	HU	SK	CZ	SI	ES	PT	PL	GR	CY	IE	TR	CH	AT	MT	LT	LV	UK	FR	B
C <sub>13</sub>	Daikin																							
C <sub>33</sub>	Daikin																							
C <sub>43</sub>	Daikin																							
C <sub>53</sub>	Daikin																							
C <sub>63</sub>	(a)											(b)	(a)	(b)							(a)	(b)		
C <sub>83</sub>	Daikin																							
C <sub>93</sub>	Daikin																							

- a** Gas exhaust/air intake parts can be bought from a third party. All parts purchased from an external supplier MUST comply with EN14471.
- b** NOT allowed.

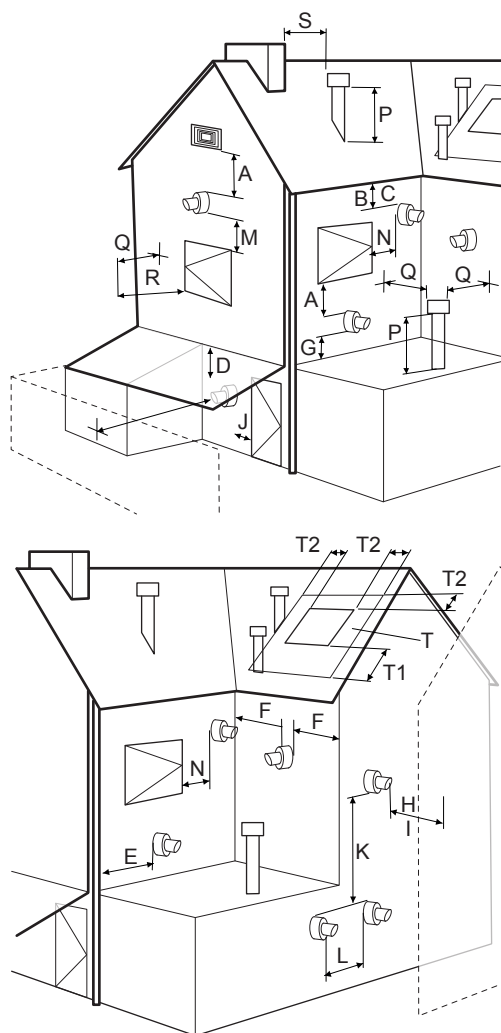
### 7.5.6 Flue pipe position

See the local and national regulations.

#### Especially for UK:

Only use flue products approved by the boiler manufacturer, which can be bought from the supplier of your boiler.

See "6.2 Combining units and options" [► 33].



	Terminal position	Minimum distance (mm)
A	Directly below an open able window or other opening (e.g. air brick)	300
B	Below gutters, soil pipes or drain pipes	75
C	Below eaves	200
D	Below balconies or car front roofs	
E	From vertical drain pipes and soil pipe	150
F	From internal or external corners	300
G	Above ground, roof or balcony level	
H	From a surface facing a terminal	600
I	From a terminal discharging towards another terminal	1200
J	From an opening in a car port (e.g. door, window) into a dwelling	
K	Vertically from a terminal on the same wall	1500
L	Horizontally from a terminal on the same wall	300
M	Above an opening, air brick, opening windows, etc.	
N	Horizontally to an opening, air brick, opening windows, etc.	
P	Above roof level (to base terminal)	
Q	From an adjacent wall to flue	
R	From an adjacent opening window	1000
S	From another roof terminal	600
-	From an external boundary. Note: If the terminal is facing a boundary, it is recommended that an anti-plume kit be fitted.	
T	Terminals adjacent to windows or openings on pitched and flat roofs: The flue should NOT penetrate this area.	2000
T1		600
T2		

**NOTICE**

The boiler manufacturer cannot be held responsible for atmospheric conditions when siting flue terminals.

**CAUTION**

Once the flue system has been installed and the appliance commissioned, the installer should observe the plume direction. Particular attention should be drawn to plume vapour reentering the gas boiler via the air intake. If this occurs, it is highly possible the flue is fitted with a negative pressure area and therefore a plume management kit MUST be fitted.

### 7.5.7 Insulation of the gas exhaust and air intake

Condensation may occur on the outside of the pipe material when the material temperature is low and the environment temperature is high with a high humidity. Use 10 mm damp-proof insulation material when there is a risk of condensation.

### 7.5.8 Fitting a horizontal flue system

The 60/100 mm horizontal flue system may be extended up to a maximum length as specified in the table indicating the maximum pipe lengths. Calculate the equivalent length according to the specifications in this manual.



#### CAUTION

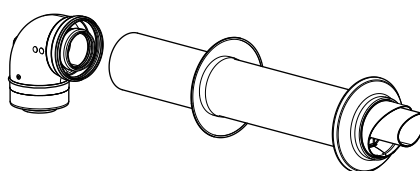
Read the installation manuals of the field supplied parts.

The horizontal flue **MUST** be installed under a 3° fall towards the boiler (50 mm per metre) and **MUST** be supported with a minimum of 1 bracket at each meter length. Best recommended position of the bracket is just before the joint.



#### INFORMATION

Flexible flue gas lines may **NOT** be used in horizontal connection sections.



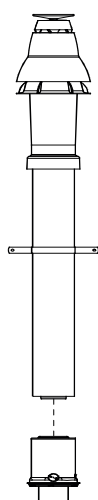
### 7.5.9 Fitting a vertical flue system

A vertical 60/100 mm flue kit is also available. By using additional components available from your boiler supplier, the kit can be extended up to a maximum length as specified in the table indicating the maximum pipe lengths (excluding the initial boiler connection).



#### CAUTION

Read the installation manuals of the field supplied parts.



### 7.5.10 Plume management kit

See the local and national regulations.

### Especially for UK:

The plume management kit comprises of a 710 mm horizontal section elbow to connect the 500 mm vertical condensing tube, which has a horizontal or vertical terminal dependant on your requirements. The maximum length of the horizontal flue including the terminal but excluding the initial elbow from the boiler and 500 mm vertical condensing tube is 7 m.



#### NOTICE

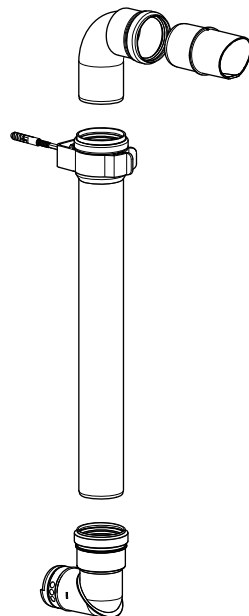
For each additional 90° elbow used the maximum flue length **MUST** be reduced by 1.5 m whilst the use of 2× 45° bends warrants a reduction of 2 m.

The horizontal part of the flue **MUST** be installed under a 3° fall towards the boiler (5 mm per m) and **MUST** be supported with a minimum of 1 bracket at each 1 m length. Best recommended position of the bracket is just before the joint.



#### CAUTION

- Sealing rings should **ONLY** be moisturized with water before use. Do **NOT** use soap or other detergents.
- When installing flues in voids, make sure that they are connected and fixed correctly. If in an existing situation a visual inspection is **NOT** possible, the boiler must **NOT** be commissioned and remain disconnected from the gas supply until suitable access has been realised.
- Make sure to follow the manufacturer's instructions regarding maximum length of the flue system, the appropriate flue material, correct jointing methods and the maximum distance between flue support.
- Make sure that all joints and seams are gastight and watertight.
- Make sure that the flue system has a uniform gradient back to the boiler.



### 7.5.11 Flues in voids

### Especially for UK:

The flue system must be connected in accordance with the manufacturer instructions before firing the boiler.

The term void includes ceiling voids, floor voids, purpose built enclosures, service risers, roof spaces or any other enclosure that will restrict access to inspect the flue.



To allow visual inspection, without reliance on devices such as endoscopes, cameras and mirrors, inspection hatches must be provided along the entire length of the flue.

Hatches must be a minimum of 300 mm×300 mm and positioned with the edge of the inspection hatch to 1.5 m of any joint and at changes of direction. Bends should be viewable from both directions where the inspection hatch cannot be positioned at the bend.

Where suitable access is not provided the appliance must NOT be commissioned and must be disconnected from the gas supply.

Additionally the entire flue and all flue seals must be installed in accordance with the requirements of BS5440:

- Check if the condensate trap is filled with water and correctly connected to the boiler.
- All flue joints are correctly made, unstressed and adequately supported.
- All parts of the flue can be visually inspected. Ensure suitable access where flue is positioned within voids.

### 7.5.12 About securing the flue system

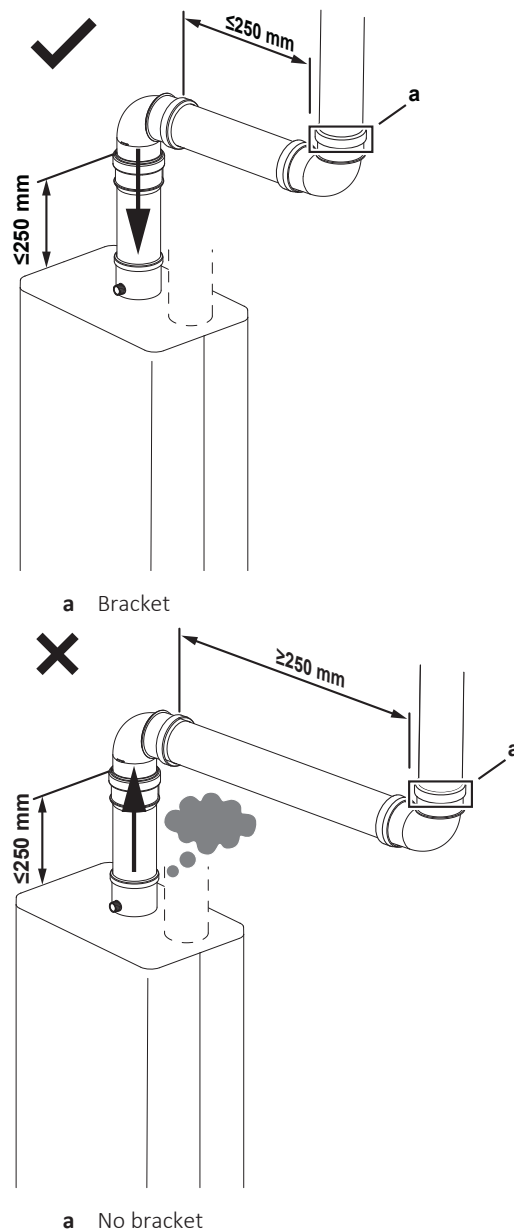


#### CAUTION

- Instructions included with the flue material are superior to the instructions in this manual.
- The flue system MUST be secured to a solid structure.
- The flue system should have a continuous fall back of 3° to the boiler. Wall terminals MUST be installed levelled.
- Only use accompanying brackets.
- Every elbow MUST be secured by using the bracket. Exception at connecting on boiler: if the length of the pipes before and after the first elbow is ≤250 mm, the second element after the first elbow has to contain a bracket. The bracket MUST be positioned on the elbow.
- Every extension MUST be secured per meter with a bracket. This bracket MUST not be clamped around the pipe ensuring free movement of the pipe.
- Make sure that the bracket is locked into the correct position depending on the position of the bracket on the pipe or elbow.
- Do NOT mix flue parts or clamps of different suppliers.

### 7.5.13 Placing brackets on the flue gas piping

The piping MUST be pushed downwards by positioning the bracket correctly.



### WARNING

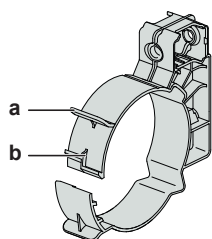
Failure to properly secure the flue gas pipes may cause the pipes to separate from the boiler module, causing the flue gas to enter the installation location. This could lead to CO poisoning of the residents.

When placing the flue gas piping, it is very important to provide an installation which is properly supported and is without tension. This is done by placing brackets on the sleeves and in some cases on the pipe itself.

Based on its location and piping material, the bracket must be placed in a fixing or a non-fixing position:

- **Fixing position:** Movement of the pipe is not possible. This is achieved by tightening the bracket on the pipe.
- **Non-fixing position:** Movement of the pipe must be possible. This is achieved by allowing some clearance between the bracket and the pipe.

### Which fixation position to use



- a** In case of fixation to a pipe
- b** In case of fixation to a sleeve

### Maximum distance between clamps

Vertical position of pipe	Other position of pipe
2000 mm	1000 mm

- Divide the length between the brackets evenly.
- Every system **MUST** contain at least 1 bracket.
- Position the first clamp at a maximum of 500 mm from the gasboiler.

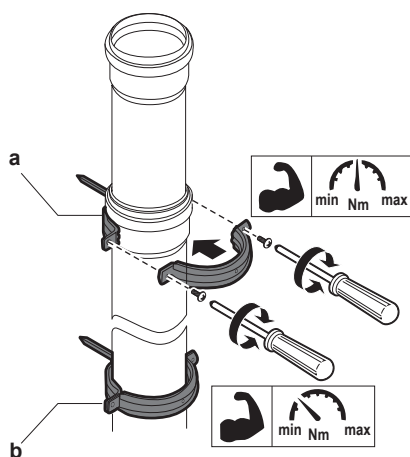
Make sure that the material of the bracket matches the material of the piping (air/flue gas):

- The metal bracket is placed on the metal piping (e.g. concentric metal-plastic piping).
- The plastic bracket is placed on the plastic piping (e.g. single-walled plastic piping).



#### INFORMATION

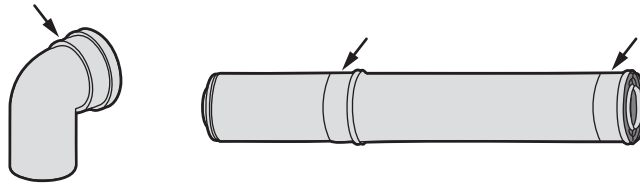
Follow the instructions provided by the manufacturer.



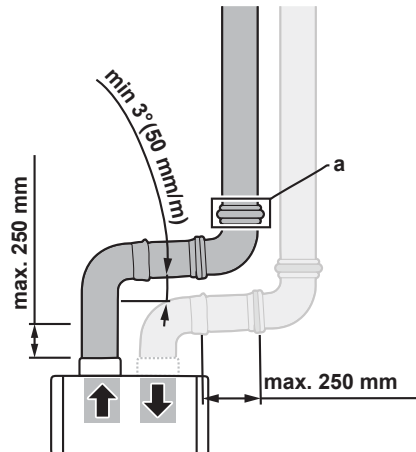
- a** Fixing bracket
- b** Non-fixing bracket

### In case of horizontal, sloping and vertical flue gas piping

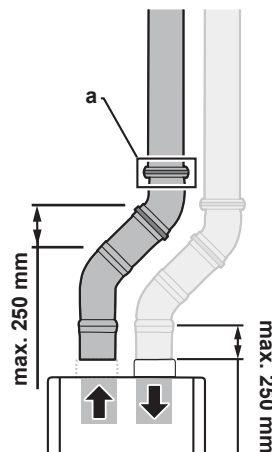
- 1 Place fixing brackets on the sleeve of each bend and extension tube.



- 2 If extension tubes before and after the first bend are shorter than 0.25 m, the second element of the sleeve after the first bend must be fitted with a fixing bracket.



a 2<sup>nd</sup> element after the 1<sup>st</sup> bend

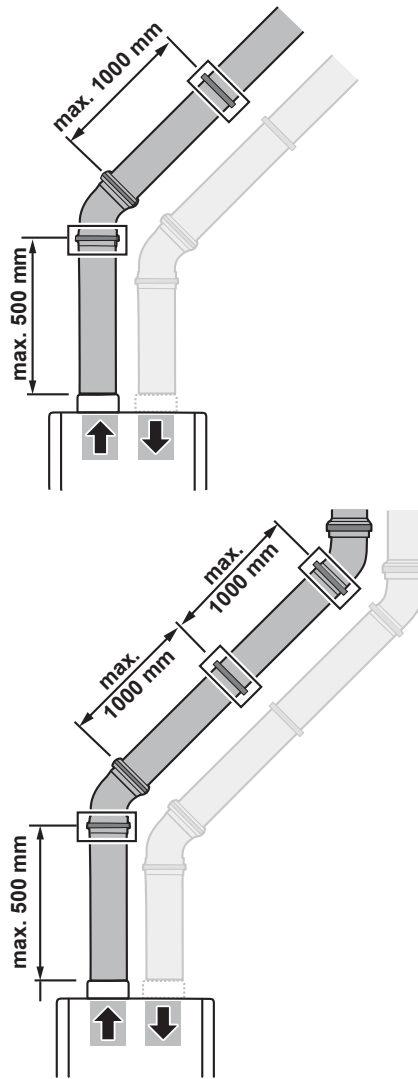


a 2<sup>nd</sup> element after the 1<sup>st</sup> bend

### In case of horizontal and sloping flue gas piping

If the distance between the fixing brackets on sleeves is greater than 1 meter:

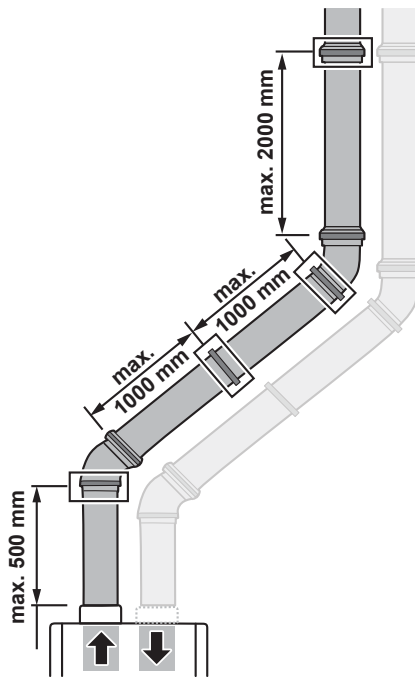
- Place a non-fixing bracket between the fixing brackets in case of the plastic piping.
- Place a fixing bracket between the fixing brackets in case of the metal piping.



### In case of vertical flue gas piping

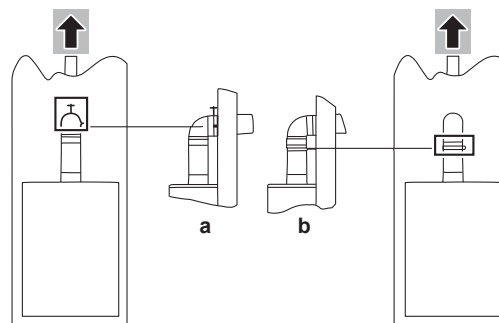
If the distance between the fixing brackets on sleeves is greater than 2 meters:

- Place one or multiple non-fixing brackets between the fixing brackets in case of the plastic piping.
- Place one or multiple fixing brackets between the fixing brackets in case of the metal piping.



### The last element before a passage or a shaft

Bracket the last element of the connecting pipe before a passage or a shaft. If this last element is a bend, the preceding element can also be braced.



a Option 1  
b Option 2

### Additional instructions when the flue system is in a shaft:

- Check that the fall of the pipes coming from the shaft is 3°.
- Check that the pipes are not blocked or damaged.
- Make sure that there is clearance between the flue and the air connection.
- Check that the connections do have an insert length of minimum 50 mm.
- Position a securing bracket on the last element before the wall.
- When this last element is an elbow, the bracket may also be placed on the previous bracket.

## 7.6 Condensate pipe work

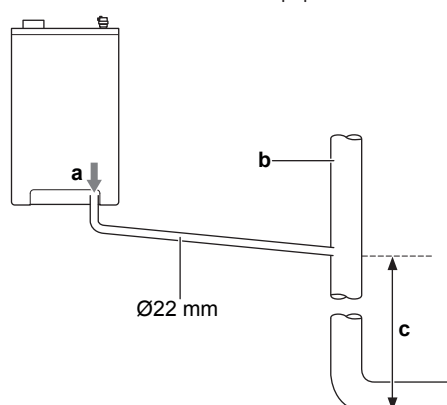


### INFORMATION

The condensate discharge system **MUST** be made of plastic, no other materials may be used. The discharge duct **MUST** have a minimum gradient of 5~20 mm/m. Condensate discharge via the gutter is **NOT** allowed due to risk of frost and the possible damage to the materials.

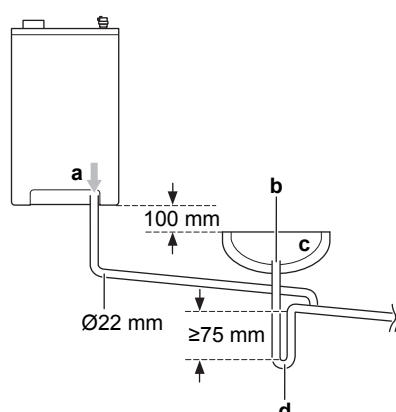
### 7.6.1 Internal connections

If possible, the condensate drain pipe should be routed and terminated so that the condensate drains away from the boiler under gravity to a suitable internal foul water discharge point such as an internal soil and vent stack. A suitable permanent connection to the foul waste pipe should be used.



- a** Condensate discharge from boiler
- b** Soil and vent stack
- c** Minimum 450 mm and up to 3 storeys

If the first option is NOT possible, an internal kitchen or bathroom waste pipe, washing machine pipe can be used. Make sure that the condensate drain pipe is connected downstream of the waste trap.

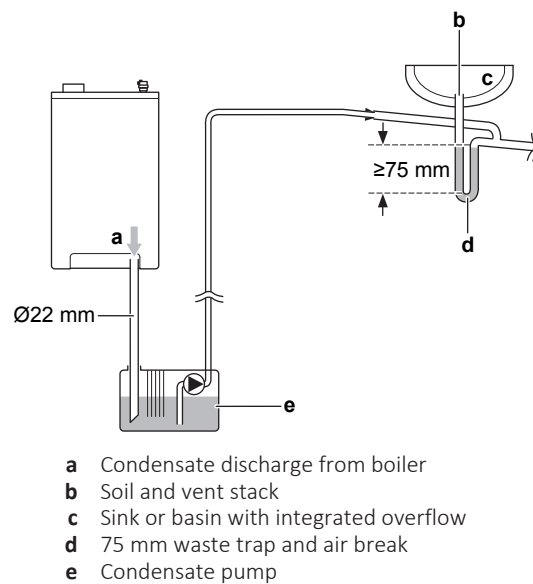


- a** Condensate discharge from boiler
- b** Soil and vent stack
- c** Sink or basin with integrated overflow
- d** 75 mm waste trap and air break

### Condensate pump

Where gravity discharge to an internal termination is NOT physically possible or where very long internal runs of drainage pipe would be required to reach a suitable discharge point, condensate should be removed by using a proprietary condensate pump (field supply).

The pump outlet pipe should discharge to a suitable internal foul water discharge point such as an internal soil and vent stack, internal kitchen, bathroom waste pipe, or washing machine waste pipe. A suitable permanent connection to the foul waste pipe should be used.



### 7.6.2 External connections

If an externally condensate drainage pipe is used, following measures should be made to prevent freezing:

- The pipe should be run internally as far as possible before going to the outside. The pipe diameter should be increased to a minimum inner diameter of 30 mm (typically outer diameter of 32 mm) before it goes through the wall.
- The external run should be kept as short as possible, taking the most vertical route possible to the discharge point. Take into account that there are no horizontal sections in which condensate might collect.
- The external pipe should be insulated. Use a suitable waterproof and weather proof insulation ("Class O" pipe insulation is suitable for this purpose).
- The use of fittings and elbows should be kept to a minimum. Any internal burrs should be removed so that the internal pipe section is as smooth as possible.



# 8 Piping installation



## CAUTION

See "4 Specific installer safety instructions" [▶ 20] to make sure this installation complies with all safety regulations.

## In this chapter

8.1	Preparing refrigerant piping .....	77
8.1.1	Refrigerant piping requirements .....	77
8.1.2	Refrigerant piping insulation .....	78
8.2	Connecting the refrigerant piping .....	79
8.2.1	About connecting the refrigerant piping .....	79
8.2.2	Precautions when connecting the refrigerant piping .....	79
8.2.3	Guidelines when connecting the refrigerant piping .....	80
8.2.4	Pipe bending guidelines .....	81
8.2.5	To flare the pipe end .....	81
8.2.6	To braze the pipe end .....	82
8.2.7	Using the stop valve and service port .....	82
8.2.8	Usage of reducers to connect the piping to the outdoor unit .....	84
8.2.9	To connect the refrigerant piping to the indoor unit .....	84
8.3	Checking the refrigerant piping .....	85
8.3.1	About checking the refrigerant piping .....	85
8.3.2	Precautions when checking the refrigerant piping .....	85
8.3.3	To check for leaks .....	85
8.3.4	To perform vacuum drying .....	86
8.3.5	To insulate the refrigerant piping .....	87
8.4	Charging refrigerant .....	87
8.4.1	About charging refrigerant .....	87
8.4.2	About the refrigerant .....	88
8.4.3	Precautions when charging refrigerant .....	89
8.4.4	To determine the additional refrigerant amount .....	89
8.4.5	To determine the complete recharge amount .....	89
8.4.6	To charge additional refrigerant .....	89
8.4.7	To fix the fluorinated greenhouse gases label .....	90
8.5	Preparing water piping .....	90
8.5.1	Water circuit requirements .....	90
8.5.2	Formula to calculate the expansion vessel pre-pressure .....	94
8.5.3	To check the water volume and flow rate .....	94
8.5.4	Changing the pre-pressure of the expansion vessel .....	96
8.5.5	To check the water volume: Examples .....	97
8.6	Connecting water piping .....	97
8.6.1	About connecting the water piping .....	97
8.6.2	Precautions when connecting the water piping .....	98
8.6.3	Connecting the water piping of the indoor unit .....	98
8.6.4	Connecting the water piping of the gas boiler .....	99
8.6.5	To fill the space heating circuit .....	101
8.6.6	To fill the domestic water circuit of the gas boiler .....	101
8.6.7	To fill the domestic hot water tank .....	101
8.6.8	To insulate the water piping .....	101
8.7	Connecting the gas piping .....	102
8.7.1	To connect the gas pipe .....	102
8.7.2	To perform an air purge on the gas supply .....	102

## 8.1 Preparing refrigerant piping

### 8.1.1 Refrigerant piping requirements



## INFORMATION

Also read the precautions and requirements in the "3 General safety precautions" [▶ 12].


**Piping material**

Phosphoric acid deoxidised seamless copper

▪ **Piping diameter:**

<b>CHYHBH05+08</b>	
Liquid piping	Ø6.4 mm (1/4")
Gas piping	Ø15.9 mm (5/8")

**Piping temper grade and thickness**

Outer diameter (Ø)	Temper grade	Thickness (t) <sup>(a)</sup>	
6.4 mm (1/4")	Annealed (O)	≥0.8 mm	
9.5 mm (3/8")		≥1 mm	
12.7 mm (1/2")		≥0.8 mm	
15.9 mm (5/8")		≥1 mm	

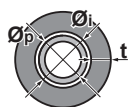
<sup>(a)</sup> Depending on the applicable legislation and the maximum working pressure of the unit (see "PS High" on the unit name plate), larger piping thickness might be required.

Usage of reducers might be required based on the outdoor unit. See ["8.2.8 Usage of reducers to connect the piping to the outdoor unit"](#) [▶ 84] for more information.

## 8.1.2 Refrigerant piping insulation

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

Pipe outer diameter (Ø <sub>p</sub> )	Insulation inner diameter (Ø <sub>i</sub> )	Insulation thickness (t)
6.4 mm (1/4")	8~10 mm	≥10 mm
9.5 mm (3/8")	10~14 mm	≥13 mm
12.7 mm (1/2")	14~16 mm	≥13 mm
15.9 mm (5/8")	16~20 mm	≥13 mm



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

Use separate thermal insulation pipes for the gas and liquid refrigerant piping.

## 8.2 Connecting the refrigerant piping

### 8.2.1 About connecting the refrigerant piping

#### Before connecting the refrigerant piping

Make sure the outdoor and indoor unit are mounted.

#### Typical workflow

Connecting the refrigerant piping involves:

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

### 8.2.2 Precautions when connecting the refrigerant piping



#### INFORMATION

Also read the precautions and requirements in the following chapters:

- "3 General safety precautions" [▶ 12]
- "8.1 Preparing refrigerant piping" [▶ 77]



#### DANGER: RISK OF BURNING/SCALDING



#### NOTICE

- Use the flare nut fixed to the main unit.
- To prevent gas leakage, apply refrigeration oil only to the inside of the flare. Use refrigeration oil for R32 (**Example:** FW68DA, SUNISO Oil).
- Do NOT reuse joints.



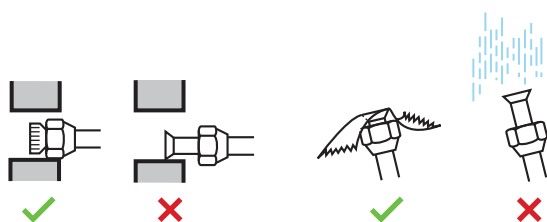
#### NOTICE

- Do NOT use mineral oil on flared part.
- Do NOT reuse piping from previous installations.
- NEVER install a drier to this R32 unit to guarantee its lifetime. The drying material may dissolve and damage the system.

**NOTICE**

Take the following precautions on refrigerant piping into account:

- Avoid anything but the designated refrigerant to get mixed into the refrigerant cycle (e.g. air).
- Only use R32 when adding refrigerant.
- Only use installation tools (e.g. manifold gauge set) that are exclusively used for R32 installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from mixing into the system.
- Install the piping so that the flare is NOT subjected to mechanical stress.
- Do NOT leave pipes unattended at the site. If the installation is NOT done within 1 day, protect the piping as described in the following table to prevent dirt, liquid or dust from entering the piping.
- Use caution when passing copper tubes through walls (see figure below).



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

**NOTICE**

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

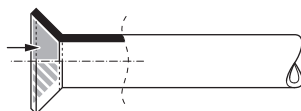
**WARNING**

Connect the refrigerant piping securely before running the compressor. If the refrigerant piping is NOT connected and the stop valve is open when the compressor is run, air will be sucked in. This will cause abnormal pressure in the refrigeration cycle, which may result in equipment damage and even injury.

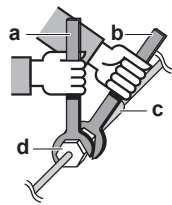
### 8.2.3 Guidelines when connecting the refrigerant piping

Take the following guidelines into account when connecting pipes:

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



- ALWAYS use 2 wrenches together when loosening a flare nut.
- ALWAYS use a spanner and torque wrench together to tighten the flare nut when connecting the piping. This to prevent nut cracking and leaks.



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

Piping size (mm)	Tightening torque (N•m)	Flare dimensions (A) (mm)	Flare shape (mm)
Ø6.4	15~17	8.7~9.1	
Ø9.5	33~39	12.8~13.2	
Ø12.7	50~60	16.2~16.6	
Ø15.9	62~75	19.3~19.7	

### 8.2.4 Pipe bending guidelines

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

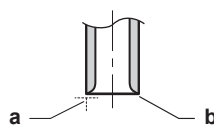
### 8.2.5 To flare the pipe end



#### CAUTION

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

- 1 Cut the pipe end with a pipe cutter.
- 2 Remove burrs with the cut surface facing down so that the chips do NOT enter the pipe.

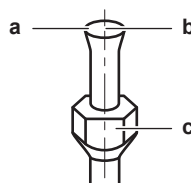


- a Cut exactly at right angles.
- b Remove burrs.

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



- 5 Check that the flaring is properly made.



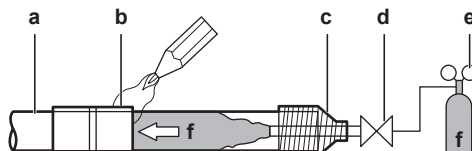
- a Flare's inner surface MUST be flawless.

- b** The pipe end **MUST** be evenly flared in a perfect circle.
- c** Make sure the flare nut is fitted.

### 8.2.6 To braze the pipe end

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

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



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

- Do NOT use anti-oxidants when brazing pipe joints. Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does NOT require flux.

Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.

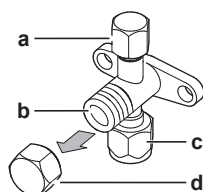
- ALWAYS protect the surrounding surfaces (e.g. insulation foam) from heat when brazing.

### 8.2.7 Using the stop valve and service port

#### To handle the stop valve

Take the following guidelines into account:

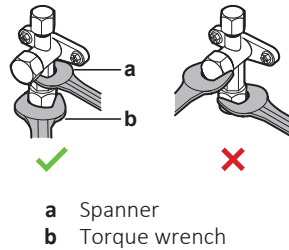
- The stop valves are factory closed.
- The following figure shows the stop valve parts required when handling the valve.



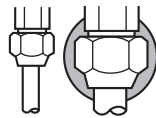
- a** Service port and service port cap
- b** Valve stem
- c** Field piping connection
- d** Stem cap

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

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



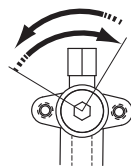
- When it is expected that the operating pressure will be low (e.g. when cooling will be performed while the outside air temperature is low), sufficiently seal the flare nut in the stop valve on the gas line with silicon sealant to prevent freezing.



■ Silicon sealant, make sure there is no gap.

### To open/close the stop valve

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



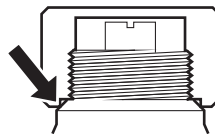
Counterclockwise to open  
Clockwise to close

- 3 When the stop valve CANNOT be turned any further, stop turning.
- 4 Install the stop valve cover.

**Result:** The valve is now open/closed.

### To handle the stem cap

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



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

### To handle the service cap

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

Item	Tightening torque (N·m)
Service port cap	10.8~14.7

### 8.2.8 Usage of reducers to connect the piping to the outdoor unit

For connecting the piping to the outdoor unit, you (possibly) need reducers. Please consult following table to see where you need which reducer.

See the outdoor unit installation manual for more information.

Port	3MXM52 3MXM68	4MXM68	4MXM80	5MXM90
A	X	X	X	X
B	CHYHBH05 <sup>(a)</sup>	X	X	X
C	CHYHBH05 <sup>(a)</sup>	CHYHBH05 <sup>(a)</sup>	CHYHBH05 CHYHBH08	X
D	—	CHYHBH05 <sup>(a)</sup>	CHYHBH05 CHYHBH08	CHYHBH05 CHYHBH08
E	—	—	—	CHYHBH05 CHYHBH08

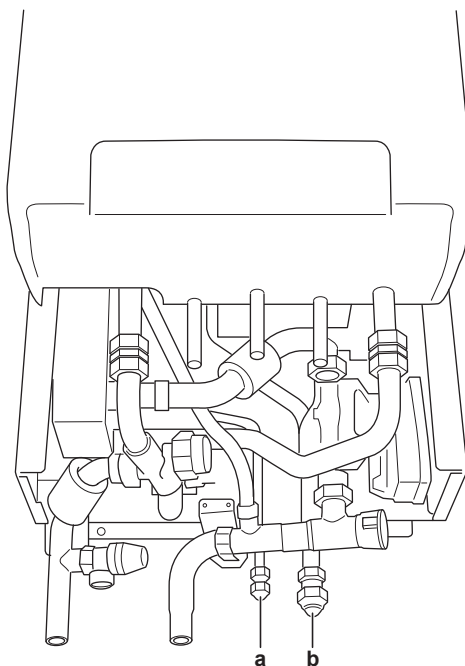
<sup>(a)</sup> Use the reducer accessory set from the accessory bag delivered with the indoor unit.

X Connection of CHYHBH05 or CHYHBH08 is NOT allowed.

— Connection of CHYHBH05 or CHYHBH08 is NOT possible.

### 8.2.9 To connect the refrigerant piping to the indoor unit

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



**a** Refrigerant liquid connection

**b** Refrigerant gas connection

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



#### NOTICE

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



## 8.3 Checking the refrigerant piping

### 8.3.1 About checking the refrigerant piping

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

#### Before checking the refrigerant piping

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

#### Typical workflow

Checking the refrigerant piping typically consists of the following stages:

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

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

### 8.3.2 Precautions when checking the refrigerant piping



#### INFORMATION

Also read the precautions and requirements in the following chapters:

- "3 General safety precautions" [▶ 12]
- "8.1 Preparing refrigerant piping" [▶ 77]



#### NOTICE

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



#### NOTICE

Use this vacuum pump for R32 exclusively. Using the same pump for other refrigerants may damage the pump and the unit.



#### NOTICE

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

### 8.3.3 To check for leaks



#### NOTICE

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



### NOTICE

ALWAYS use a recommended bubble test solution from your wholesaler.

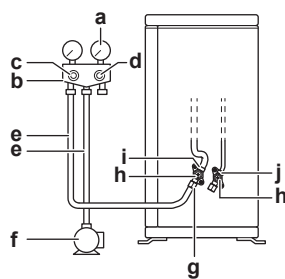
NEVER use soap water:

- Soap water may cause cracking of components, such as flare nuts or stop valve caps.
- Soap water may contain salt, which absorbs moisture that will freeze when the piping gets cold.
- Soap water contains ammonia which may lead to corrosion of flared joints (between the brass flare nut and the copper flare).

- 1 Charge the system with nitrogen gas up to a gauge pressure of at least 200 kPa (2 bar). It is recommended to pressurize to 3000 kPa (30 bar) or higher (depending on local legislation) to detect small leaks.
- 2 Check for leaks by applying the bubble test solution to all connections.
- 3 Discharge all nitrogen gas.

### 8.3.4 To perform vacuum drying

Connect the vacuum pump and manifold as follows:



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

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

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

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

**NOTICE**

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

**INFORMATION**

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

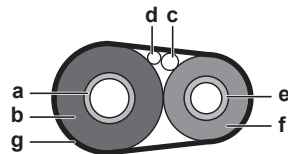
### 8.3.5 To insulate the refrigerant piping

#### Between outdoor and indoor unit

**NOTICE**

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

- 1 Insulate and fix the refrigerant piping and cables as follows:



- a Gas pipe
- b Gas pipe insulation
- c Interconnection cable
- d Field wiring (if applicable)
- e Liquid pipe
- f Liquid pipe insulation
- g Finishing tape

- 2 Install the service cover.

## 8.4 Charging refrigerant

### 8.4.1 About charging refrigerant

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

What	When
Charging additional refrigerant	When the total liquid piping length is more than specified (see later).
Completely recharging refrigerant	<b>Example:</b> <ul style="list-style-type: none"> <li>▪ When relocating the system.</li> <li>▪ After a leak.</li> </ul>

#### Charging additional refrigerant

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

**INFORMATION**

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

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

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

### Completely recharging refrigerant

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

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

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

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

#### 8.4.2 About the refrigerant

This product contains fluorinated greenhouse gases. Do NOT vent gases into the atmosphere.

Refrigerant type: R32

Global warming potential (GWP) value: 675

Periodical inspections for refrigerant leaks may be required depending on the applicable legislation. Contact your installer for more information.

**WARNING: FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.

**WARNING**

- The refrigerant inside the unit is mildly flammable, but normally does NOT leak. If the refrigerant leaks in the room and comes in contact with fire from a burner, a heater, or a cooker, this may result in fire, or the formation of a harmful gas.
- Turn OFF any combustible heating devices, ventilate the room, and contact the dealer where you purchased the unit.
- Do NOT use the unit until a service person confirms that the part from which the refrigerant leaked has been repaired.

**WARNING**

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use cleaning materials or means to accelerate the defrosting process other than those recommended by the manufacturer.
- Be aware that the refrigerant inside the system is odourless.

**NOTICE**

Applicable legislation on **fluorinated greenhouse gases** requires that the refrigerant charge of the unit is indicated both in weight and CO<sub>2</sub> equivalent.

**Formula to calculate the quantity in CO<sub>2</sub> equivalent tonnes:** GWP value of the refrigerant × total refrigerant charge [in kg]/1000

Contact your installer for more information.

## 8.4.3 Precautions when charging refrigerant

**INFORMATION**

Also read the precautions and requirements in the following chapters:

- "3 General safety precautions" [▶ 12]
- "8.1 Preparing refrigerant piping" [▶ 77]

## 8.4.4 To determine the additional refrigerant amount

If the total liquid piping length is...	Then...
≤30 m	Do NOT add additional refrigerant.
>30 m	$R = (\text{total length (m) of liquid piping} - 30 \text{ m}) \times 0.020$ $R = \text{Additional charge (kg) (rounded in units of 0.1 kg)}$

**INFORMATION**

Piping length is the one-way length of liquid piping.

For the maximum allowable refrigerant charge amount, see the outdoor unit installation manual.

## 8.4.5 To determine the complete recharge amount

**INFORMATION**

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

## 8.4.6 To charge additional refrigerant

**WARNING**

- Only use R32 as refrigerant. Other substances may cause explosions and accidents.
- R32 contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 675. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, ALWAYS use protective gloves and safety glasses.

**NOTICE**

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

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

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

If pump down is needed in case of dismantling or relocating the system, see "[16.2 To pump down](#)" [▶ 203] for more details.

#### 8.4.7 To fix the fluorinated greenhouse gases label

- 1 Fill in the label as follows:

The diagram shows a label with the following fields and labels:

- a**: Contains fluorinated greenhouse gases
- b**: ① =  kg
- c**: ② =  kg
- d**: ① + ② =  kg
- e**:  $\frac{\text{GWP} \times \text{kg}}{1000} = \text{tCO}_2\text{eq}$
- f**: Points to the label header area.

- a** If a multilingual fluorinated greenhouse gases label is delivered with the unit (see accessories), peel off the applicable language and stick it on top of **a**.
- b** Factory refrigerant charge: see unit name plate
- c** Additional refrigerant amount charged
- d** Total refrigerant charge
- e** **Quantity of fluorinated greenhouse gases** of the total refrigerant charge expressed as tonnes CO<sub>2</sub> equivalent.
- f** GWP = Global Warming Potential

**NOTICE**

Applicable legislation on **fluorinated greenhouse gases** requires that the refrigerant charge of the unit is indicated both in weight and CO<sub>2</sub> equivalent.

**Formula to calculate the quantity in CO<sub>2</sub> equivalent tonnes:** GWP value of the refrigerant × total refrigerant charge [in kg] / 1000

Use the GWP value mentioned on the refrigerant charge label.

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

## 8.5 Preparing water piping

### 8.5.1 Water circuit requirements

**INFORMATION**

Also read the precautions and requirements in the "[3 General safety precautions](#)" [▶ 12].

**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 from entering the pipe.
  - Use a decent thread sealant to seal connections.
  - When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.
  - Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.
- **Closed circuit.** Use the indoor unit ONLY in a closed water system. Using the system in an open water system will lead to excessive corrosion.
- **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 "[17 Technical data](#)" [► 206] for the external static pressure curves of the indoor unit.

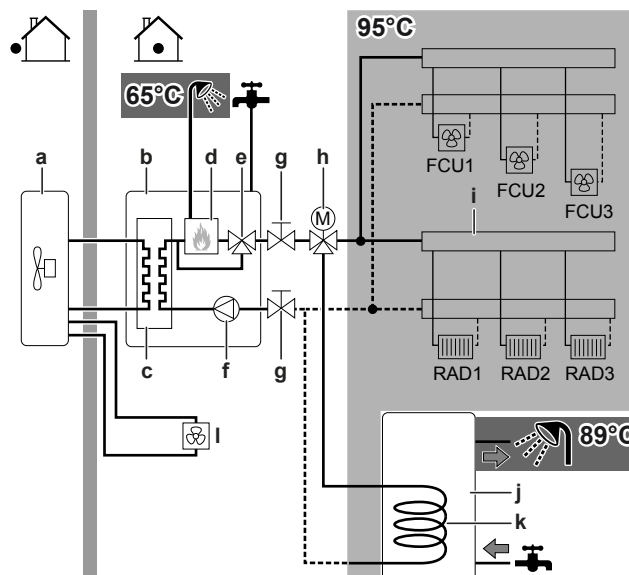
Minimum required flow rate	
05+08 models	9 l/min

- **Field supply components – Water.** Only use materials that are compatible with water used in the system and with the materials used in the indoor unit.
- **Field supply components – Water pressure and temperature.** Check that all components in the field piping can withstand the water pressure and water temperature.
- **Water temperature – Heat pump convectors.** In case heat pump convectors are connected, the temperature of the water in the convectors should NOT exceed 65°C. If necessary, install a thermostatic controlled valve.
- **Water temperature – Underfloor heating loops.** In case underfloor heating loops are connected, install a mixing station to prevent water that is too hot from entering the underfloor heating circuit.
- **Water temperature.** All installed piping and piping accessories (valve, connections,...) MUST withstand the following temperatures:



#### INFORMATION

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



- a Outdoor unit
- b Indoor unit
- c Heat exchanger
- d Boiler
- e Bypass valve
- f Pump
- g Shut-off valve (field supply)
- h Motorised 3-way valve (in option kit)
- i Collector
- j Domestic hot water tank (optional)
- k Heat exchanger coil
- l Direct expansion unit
- FCU1...3 Fan coil unit (optional)
- RAD1...3 Radiator (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.
- **Air vents.** Provide air vents at all high points of the system, which must also be easily accessible for servicing. An automatic air purge is provided in the indoor unit. Check that the air purge is NOT tightened too much, so that automatic release of air in the water circuit is possible.
- **Zn-coated parts.** NEVER use zinc coated parts in the water circuit. Because the internal water circuit of the unit 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 is 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 are fully separated.
- **Valve – Changeover time.** When using a 2-way valve or a 3-way valve in the water circuit, the maximum changeover 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.

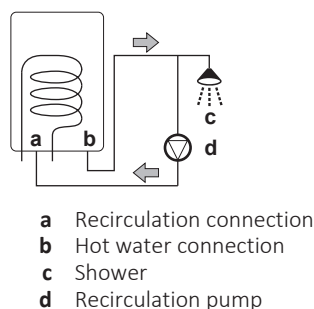


- **Dirt separator – Old heating installations.** In case of old heating installations, it is recommended to use a dirt separator. Dirt or sediment from the heating installation can damage the unit and reduce its lifetime. The domestic hot water circuit can also be protected by a filter to prevent failure during domestic hot water operation.
- **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 "[Domestic hot water control: advanced](#)" [▶ 142].
- **Domestic hot water tank – 3rd party tank installation.** When installing a 3rd party tank, take following requirements into account:
  - coil size should be  $\geq 0.45 \text{ m}^2$ ,
  - water piping is  $\geq 3/4"$  to avoid high pressure drops,
  - a sensor pocket is foreseen at a correct place (above the heating coil). The tank sensor should not be in contact with water.
  - maximum tank set point for a 3rd party tank is  $60^\circ\text{C}$ ,
  - in case of an electrical heater in the tank, make sure it is installed correctly (above the heating coil).

Refer to the installation manual of the domestic hot water tank for more information.

- **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 (i.e. between **c** and **a**).

Requirement for France (Arrêté du 30/11/05): If the water volume between the tank hot water outlet and the tap point (i.e. between **b** and **c**) exceeds 3 litres, the water temperature must be maintained at or above  $50^\circ\text{C}$  throughout the entire distribution system.



### 8.5.2 Formula to calculate the expansion vessel pre-pressure

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

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

### 8.5.3 To check the water volume and flow rate

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

To make sure that the unit operates properly:

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

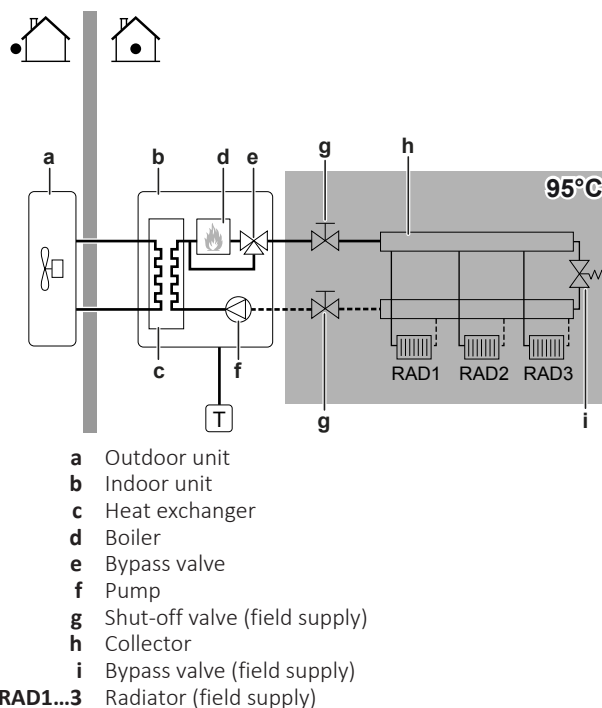
#### Minimum water volume

The installation needs to be made in such a way that a minimum water volume of 13.5 litres is always available in the space heating loop of the unit, even when the available volume towards the unit is reduced because of closure of valves (heat emitters, thermostatic valves, etc.) in the space heating circuit. The internal water volume of the indoor unit is NOT considered for this minimum water volume.



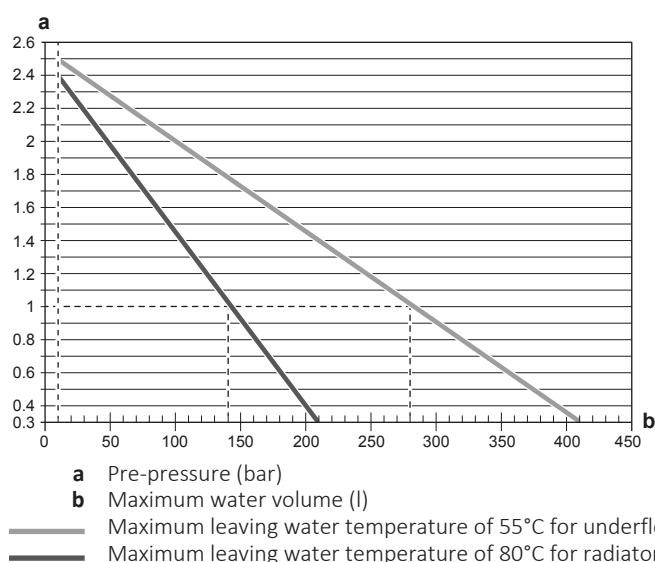
#### INFORMATION

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



#### Maximum water volume

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



**Example in case of an underfloor heating application: Maximum water volume and expansion vessel pre-pressure in case of 55°C**

Installation height difference <sup>(a)</sup>	Water volume	
	≤280 l	>280 l
≤7 m	No pre-pressure adjustment is required.	Do the following: <ul style="list-style-type: none"> <li>Decrease the pre-pressure.</li> <li>Check if the water volume does NOT exceed the maximum allowed water volume.</li> </ul>
>7 m	Do the following: <ul style="list-style-type: none"> <li>Increase the pre-pressure.</li> <li>Check if the water volume does NOT exceed the maximum allowed water volume.</li> </ul>	The expansion vessel of the indoor unit is too small for the installation. In this case, it is recommended to install an extra vessel outside the unit.

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

**Example in case of a radiator application: Maximum water volume and expansion vessel pre-pressure in case of 80°C**

Installation height difference <sup>(a)</sup>	Water volume	
	≤140 l	>140 l
≤7 m	No pre-pressure adjustment is required.	Do the following: <ul style="list-style-type: none"> <li>Decrease the pre-pressure.</li> <li>Check if the water volume does NOT exceed the maximum allowed water volume.</li> </ul>

Installation height difference <sup>(a)</sup>	Water volume	
	≤140 l	>140 l
>7 m	Do the following: <ul style="list-style-type: none"> <li>▪ Increase the pre-pressure.</li> <li>▪ Check if the water volume does NOT exceed the maximum allowed water volume.</li> </ul>	The expansion vessel of the indoor unit is too small for the installation. In this case, it is recommended to install an extra vessel outside the unit.

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

### Minimum flow rate

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

Minimum required flow rate	
05+08 models	9 l/min



#### 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).

See the recommended procedure as described in "12.4 Checklist during commissioning" [► 170].

### 8.5.4 Changing the pre-pressure of the expansion vessel



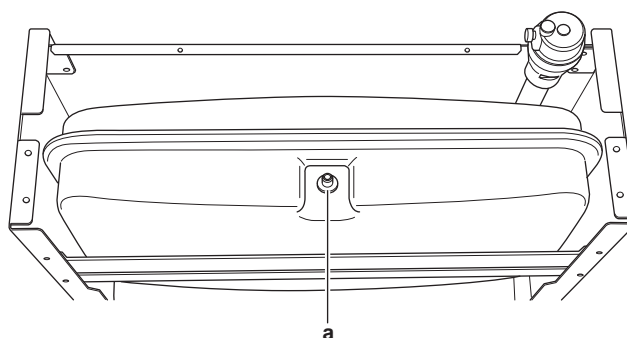
#### NOTICE

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

The default pre-pressure of the expansion vessel is 1 bar. When it is required to change the pre-pressure, 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

### 8.5.5 To check the water volume: Examples

#### Example 1

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

No actions or adjustments are required for either underfloor heating loops or radiators.

#### Example 2

The indoor unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 350 l. Radiators are installed, so use the graph of 80°C.

Actions:

- Because the total water volume (350 l) is more than the default water volume (140 l), the pre-pressure must be decreased.
- The required pre-pressure is:  

$$P_g = (0.3 + (H/10)) \text{ bar} = (0.3 + (0/10)) \text{ bar} = 0.3 \text{ bar}$$
- The corresponding maximum water volume at 0.3 bar is 205 l. (See the graph in the chapter above).
- Because 350 l is more than 205 l, the expansion vessel is too small for the installation. Therefore install an extra vessel outside the installation.

## 8.6 Connecting water piping

### 8.6.1 About connecting the water piping

#### Before connecting the water piping

Make sure the outdoor unit, indoor unit and gas boiler are mounted.

#### Typical workflow

Connecting the water piping typically consists of the following stages:

- 1 Connecting the water piping of the indoor unit.
- 2 Connecting the water piping of the gas boiler.
- 3 If necessary, performing a wiring error check. See "[12.4.1 To perform a wiring error check](#)" [▶ 170].



#### INFORMATION

- You only have to perform a wiring error check if you are not sure that the electrical wiring and piping is connected correctly.
- If you perform a wiring error check, the hybrid for multi indoor unit will not operate by heat pump for 72 hours. During this time, the gas boiler will take over the hybrid operation.

- 4 Filling the space heating circuit.
- 5 Filling the domestic water circuit of the gas boiler.
- 6 Filling the domestic hot water tank.
- 7 Insulating the water piping.

### 8.6.2 Precautions when connecting the water piping



#### INFORMATION

Also read the precautions and requirements in the following chapters:

- "3 General safety precautions" [▶ 12]
- "8.5 Preparing water piping" [▶ 90]

### 8.6.3 Connecting the water piping of the indoor unit

#### To connect the water piping for space heating



#### NOTICE

In case of old heating installations, it is recommended to use a dirt separator. Dirt or sediment from the heating installation can damage the unit and reduce its lifetime.



#### NOTICE

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



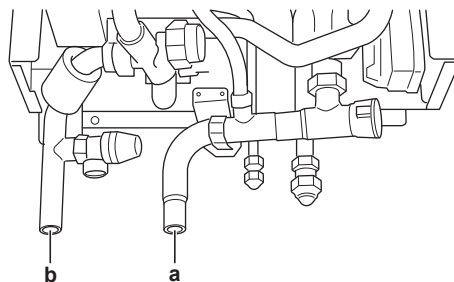
#### NOTICE

- It is recommended to install shut-off valves to space heating in and space heating out connections. Shut-off valves are field supplied. They allow service to the unit without draining the whole system.
- Foresee a drain/fill point to drain or fill the space heating circuit



#### NOTICE

Do NOT install valves to shut down the entire emitter system (radiators, floor heating loops, fan coil units, ...) instantly if this can result in an immediate short circuit of the water flow between the outlet and the inlet of the unit (for example via a bypass valve). This may trigger an error.



- a Water inlet  
b Water outlet

- 1 Connect the water inlet connection (Ø22 mm).
- 2 Connect the water outlet connection (Ø22 mm).
- 3 In case of connection with the optional domestic hot water tank, see the installation manual of the domestic hot water tank.



#### NOTICE

Install air purge valves at all local high points.

**NOTICE**

In case an optional domestic hot water tank is installed: A pressure relief valve (field supply) with an opening pressure of maximum 10 bar (= 1 MPa) 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:

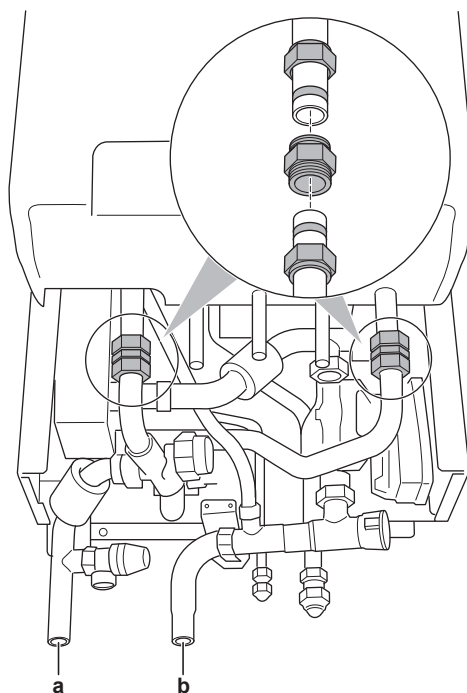
- A drain device and pressure relief device must be installed on the cold water inlet connection of the domestic hot water cylinder.
- To avoid back siphonage, it is recommended to install a non-return valve on the water inlet of the domestic hot water tank in accordance with the applicable legislation. Make sure it is NOT between the pressure relief valve and the DHW tank.
- It is recommended to install a pressure reducing valve on the cold water inlet in accordance with the applicable legislation.
- It is recommended to install an expansion vessel 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.

#### 8.6.4 Connecting the water piping of the gas boiler

##### To connect the water piping for space heating

Use the straight brass fitting connections (accessory of the heat pump unit).

- 1** The space heating piping of the boiler will be connected to the indoor unit.
- 2** Install the straight brass fitting connections so that they perfectly match the connection of both modules.
- 3** Tighten the straight brass fitting connections.



- a** Outlet space heating  
**b** Inlet space heating

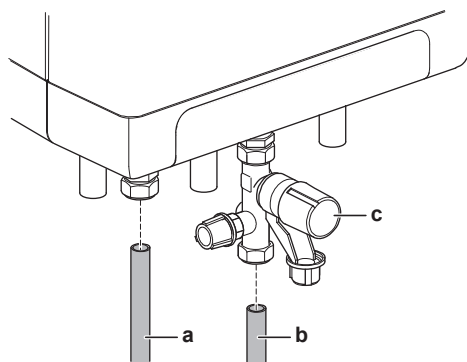


#### NOTICE

Make sure that the straight brass fitting connections are tightened thoroughly to prevent leakage. Maximum torque is 30 N·m.

#### To connect the water piping for domestic hot water (not applicable for Switzerland)

- 1 Flush the installation thoroughly to clean.



- a** Domestic hot water outlet  
**b** Cold water inlet  
**c** Pressure relief valve (field supply)

- 2 Install a pressure relief valve according to local and national regulations (if required).
- 3 Connect the hot water connection (Ø15 mm).
- 4 Connect the main cold water connection (Ø15 mm).



#### DANGER: RISK OF BURNING/SCALDING

In case of high leaving water setpoints for space heating (either a high fixed setpoint or a high weather-dependent setpoint at low ambient temperatures), the heat exchanger of the boiler can be heated up to temperatures higher than 60°C.

In case of a tapping demand, it is possible that a small volume of water tapping (<0.3 l) has a temperature higher than 60°C.



**To connect the water piping for domestic hot water (applicable for Switzerland)**

For Switzerland, domestic hot water should be made by a domestic hot water tank. The domestic hot water tank must be installed with a 3-way valve to the space heating piping. See the manual of the domestic hot water tank for more details.

**8.6.5 To fill the space heating circuit**

Before filling the space heating circuit, the gas boiler MUST be installed.

- 1** Flush the installation thoroughly to clean the circuit.
- 2** Connect the water supply hose to the drain point (field supply).
- 3** Power up the gas boiler to see the pressure indication on the boiler display.
- 4** Make sure that the air purge valves of the gas boiler and the heat pump module are open (at least 2 turns).
- 5** Fill the circuit with water until the boiler display indicates a pressure of  $\pm 2$  bar (with a minimum of 0.5 bar).
- 6** Purge air from the water circuit as much as possible.
- 7** Disconnect the water supply hose from the drain point.

**NOTICE**

The water pressure indicated on the boiler display 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.

**NOTICE**

- Air in the water circuit can cause malfunctioning. During filling, it may not be possible to remove all the air from the circuit. Remaining air will be removed through the automatic air purge valves during the initial operating hours of the system. Additional filling with water afterwards may be required.
- To purge the system, use the special function as described in the chapter "[12 Commissioning](#)" [[▶ 168](#)]. This function should be used to purge the heat exchanger coil of the domestic hot water tank.

**8.6.6 To fill the domestic water circuit of the gas boiler**

- 1** Open the main tap to pressurise the hot water section.
- 2** Vent the exchanger and the pipe system by opening a hot water tap.
- 3** Leave the tap open until all air has disappeared from the system.
- 4** Check all connections for leaks including internal connections.

**8.6.7 To fill the domestic hot water tank**

See the installation manual of the domestic hot water tank.

**8.6.8 To insulate the water piping**

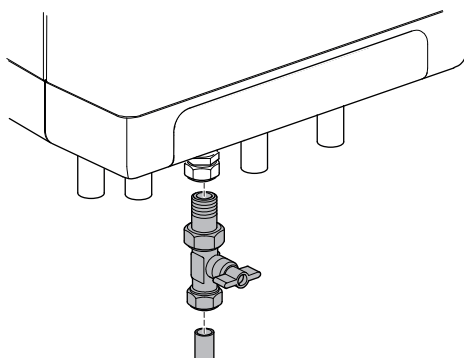
The piping in the complete water circuit MUST be insulated to prevent reduction of the heating capacity.

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

## 8.7 Connecting the gas piping

### 8.7.1 To connect the gas pipe

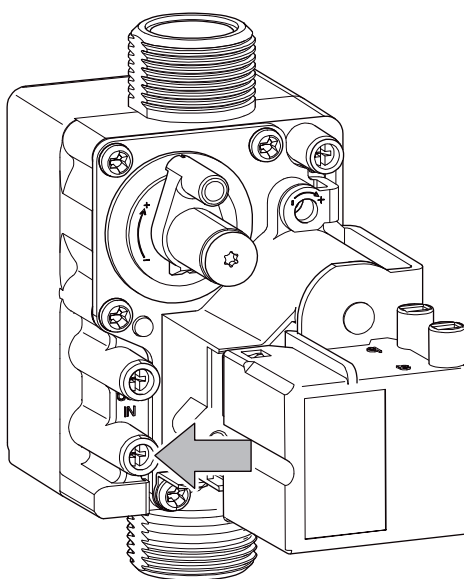
- 1 Connect a gas valve to the 15 mm gas connection of the gas boiler and connect it to the field pipe according to local regulations.



- 2 Install a gas mesh filter in the gas connection if the gas may be contaminated.
- 3 Connect the gas boiler to the gas supply.
- 4 Check all parts for gas leaks on a pressure of maximum 50 mbar (500 mm H<sub>2</sub>O). There may be no stress on the gas supply connection.

### 8.7.2 To perform an air purge on the gas supply

- 1 Turn once the screw counterclockwise.



**Result:** Gas supply will purge air.

- 2 Check all connections for leakage.
- 3 Check the gas supply pressure.



#### INFORMATION

Make sure the working inlet pressure does NOT interfere with other gas appliances installed.

# 9 Electrical installation

## In this chapter

9.1	About connecting the electrical wiring .....	103
9.1.1	Precautions when connecting the electrical wiring .....	103
9.1.2	Guidelines when connecting the electrical wiring .....	104
9.1.3	Overview of electrical connections except external actuators.....	105
9.1.4	Overview of electrical connections for external and internal actuators .....	105
9.2	Connections to the indoor unit .....	107
9.2.1	To connect the electrical wiring to the indoor unit .....	107
9.2.2	To connect the main power supply of the indoor unit .....	108
9.2.3	To connect the main power supply of the gas boiler.....	109
9.2.4	To connect the communication cable between gas boiler and indoor unit.....	109
9.2.5	To connect the user interface.....	111
9.2.6	To connect the shut-off valve .....	112
9.2.7	To connect the domestic hot water pump.....	113
9.2.8	To connect the alarm output.....	113
9.2.9	To connect the space heating ON/OFF output .....	114
9.2.10	To connect the safety thermostat .....	114

## 9.1 About connecting the electrical wiring

### Typical workflow

Connecting the electrical wiring typically consists of the following stages:

- 1 Making sure the power supply system complies with the electrical specifications of the heat pump.
- 2 Connecting the electrical wiring to the outdoor unit.
- 3 Connecting the electrical wiring to the indoor unit.
- 4 Connecting the main power supply of the indoor unit.
- 5 Connecting the main power supply of the gas boiler.
- 6 Connecting the communication cable between the gas boiler and the indoor unit.
- 7 Connecting the user interface.
- 8 Connecting the shut-off valves.
- 9 Connecting the domestic hot water pump.
- 10 Connecting the alarm output.
- 11 Connecting the space heating ON/OFF output.
- 12 Connecting the safety thermostat.

### 9.1.1 Precautions when connecting the electrical wiring



#### **DANGER: RISK OF ELECTROCUTION**



#### **WARNING**

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



### WARNING

ALWAYS use multicore cable for power supply cables.



### INFORMATION

Also read the precautions and requirements in the "[3 General safety precautions](#)" [▶ 12].



### 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 shocks.
- 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, extension cords, or connections from a star system. They can cause overheating, electrical shocks 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.

## 9.1.2 Guidelines when connecting the electrical wiring



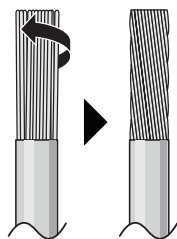
### NOTICE

We recommend using solid (single-core) wires. If stranded wires are used, slightly twist the strands to consolidate the end of the conductor for either direct use in the terminal clamp or insertion in a round crimp-style terminal.

### To prepare stranded conductor wire for installation

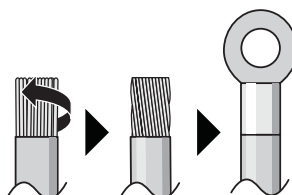
#### Method 1: Twisting conductor

- 1 Strip insulation (20 mm) from the wires.
- 2 Slightly twist the end of the conductor to create a "solid-like" connection.

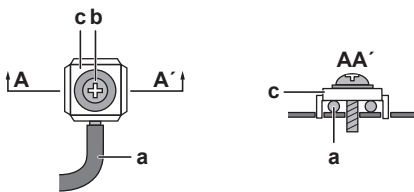
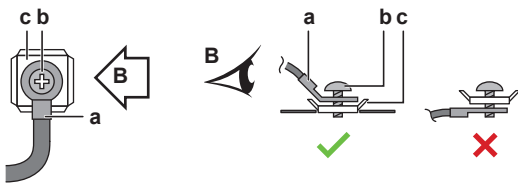


#### Method 2: Using round crimp-style terminal (recommended)

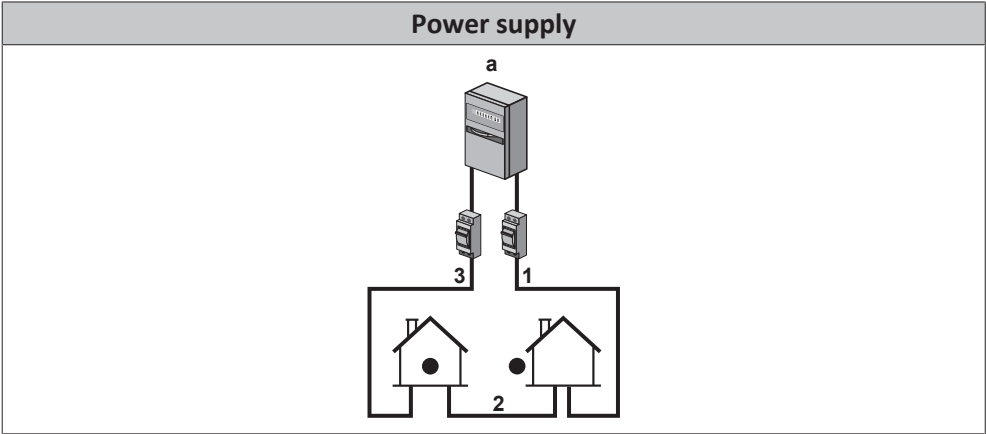
- 1 Strip insulation from wires and slightly twist the end of each wire.
- 2 Install a round crimp-style terminal on the end of the wire. Place the round crimp-style terminal on the wire up to the covered part and fasten the terminal with the appropriate tool.



Use the following methods for installing wires:

Wire type	Installation method
Single-core wire Or Stranded conductor wire twisted to "solid-like" connection	 <b>a</b> Curled wire (single-core or twisted stranded conductor wire) <b>b</b> Screw <b>c</b> Flat washer
Stranded conductor wire with round crimp-style terminal	 <b>a</b> Terminal <b>b</b> Screw <b>c</b> Flat washer ✓ Allowed ✗ NOT allowed


9.1.3 Overview of electrical connections except external actuators



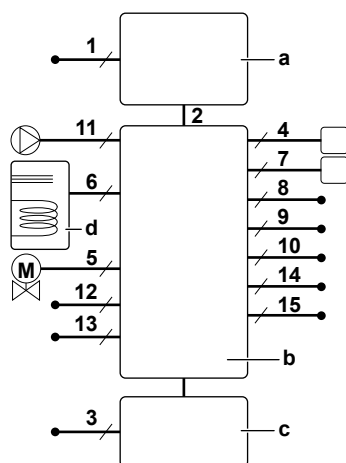
- a** Power supply
- 1** Power supply for outdoor unit
- 2** Power supply and interconnection cable to indoor unit
- 3** Power supply for gas boiler

9.1.4 Overview of electrical connections for external and internal actuators

The following illustration shows the required field wiring.

**INFORMATION**

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



- a** Outdoor unit  
**b** Indoor unit  
**c** Gas boiler  
**d** Domestic hot water tank

Item	Description	Wires	Maximum running current
<b>Outdoor unit and indoor unit power supply</b>			
1	Power supply for outdoor unit	2+GND	(a)
2	Power supply and interconnection cable to indoor unit	3+GND	(b)
3	Power supply gas boiler	2+GND	(c)
<b>User interface</b>			
4	User interface	2	(d)
<b>Optional equipment</b>			
5	3-way valve	3	100 mA <sup>(e)</sup>
6	Domestic hot water tank thermistor	2	(f)
7	Room thermostat/heat pump convector	3 or 4	100 mA <sup>(e)</sup>
8	Outdoor ambient temperature sensor	2	(e)
9	Indoor ambient temperature sensor	2	(e)
<b>Field supplied components</b>			
10	Shut-off valve	2	100 mA <sup>(e)</sup>
11	Domestic hot water pump	2	(e)
12	Alarm output	2	(e)
13	Changeover to external heat source control	2	(e)
14	Space heat operation control	2	(e)

Item	Description	Wires	Maximum running current
15	Safety thermostat	2	(g)

- (a) Refer to the nameplate of the outdoor unit.  
 (b) Cable section 1.5 mm<sup>2</sup>; maximum length: 50 m.  
 (c) Use the cable supplied with the boiler.  
 (d) Cable section 0.75 mm<sup>2</sup> till 1.25 mm<sup>2</sup>; maximum length: 500 m. Applicable for both single user interface and dual user interface connection.  
 (e) Minimum cable section 0.75 mm<sup>2</sup>.  
 (f) The thermistor and connection wire (12 m) are delivered with the domestic hot water tank.  
 (g) Cable section 0.75 mm<sup>2</sup> till 1.25 mm<sup>2</sup>; maximum length: 50 m. Voltage-free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.

**NOTICE**

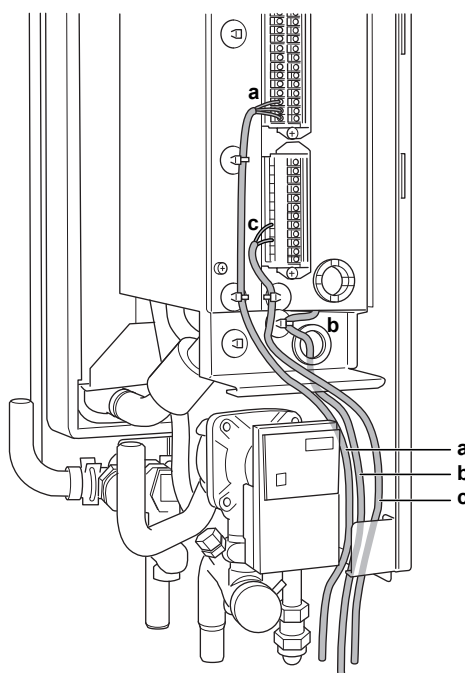
More technical specifications of the different connections are indicated on the inside of the indoor unit.

## 9.2 Connections to the indoor unit

### 9.2.1 To connect the electrical wiring to the indoor unit

It is recommended to install all electrical wiring to the hydro box before installing the boiler.

- 1 Wiring should enter the unit from the bottom.
- 2 Routing of the wiring inside the unit should be as follows:

**INFORMATION**

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

Routing	Possible cables (depending on unit type and installed options)
a	<ul style="list-style-type: none"> <li>Interconnection cable between indoor and outdoor unit</li> <li>Heat pump convector (option)</li> <li>Room thermostat (option)</li> <li>3-way valve (option in case of tank)</li> <li>Shut-off valve (field supply)</li> <li>Domestic hot water pump (field supply)</li> </ul>
b	<ul style="list-style-type: none"> <li>Interconnection cable between indoor unit and gas boiler (see boiler manual for connection instructions)</li> </ul>
c	<ul style="list-style-type: none"> <li>Outdoor ambient temperature sensor (option)</li> <li>User interface</li> <li>Indoor ambient temperature sensor (option)</li> <li>Safety thermostat (field supply)</li> </ul>

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



#### CAUTION

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

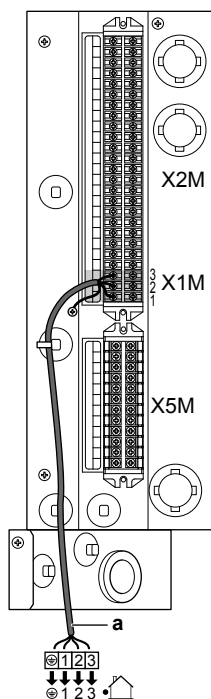


#### NOTICE

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

### 9.2.2 To connect the main power supply of the indoor unit

- 1** Connect the main power supply.



**a** Interconnection cable (=main power supply)

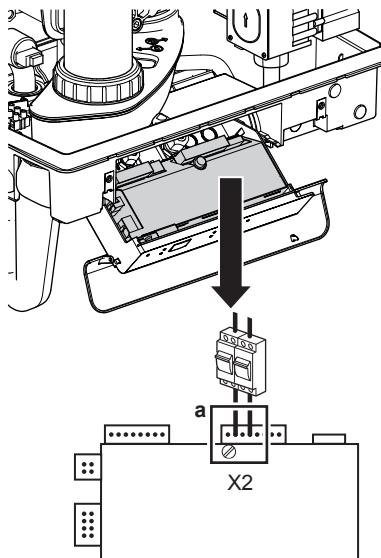
- 2** Fix the cable with cable ties to the cable tie mountings.



## 9.2.3 To connect the main power supply of the gas boiler

- 1 Connect the power supply cable of the gas boiler to a fuse (a) (L: X2-2 (BRN), N: X2-4 (BLU)).
- 2 Connect the earthing of the gas boiler to an earthing terminal.

**Result:** The gas boiler performs a test.  $\Sigma$  appears on the service display. After the test, - appears on the service display (wait mode). The pressure in bar is shown on the main display.

**DANGER: RISK OF ELECTROCUTION**

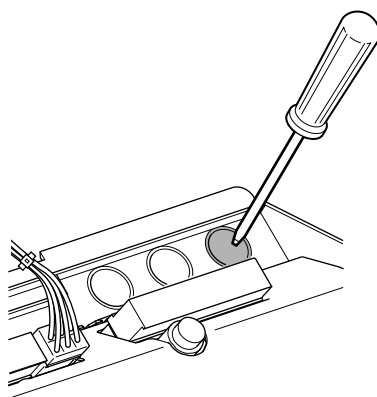
A fused spur or an unswitched socket **MUST** be located no more than 1 m from the appliance.

**CAUTION**

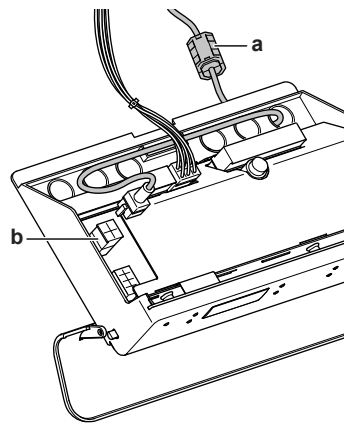
For installation in damp rooms, a fixed connection is obligatory. When working on the electrical circuit **ALWAYS** isolate the electric supply.

## 9.2.4 To connect the communication cable between gas boiler and indoor unit

- 1 Open the gas boiler.
- 2 Open the switch box cover of the gas boiler.
- 3 Remove one of the bigger knockout holes on the right side of the switch box of the gas boiler.

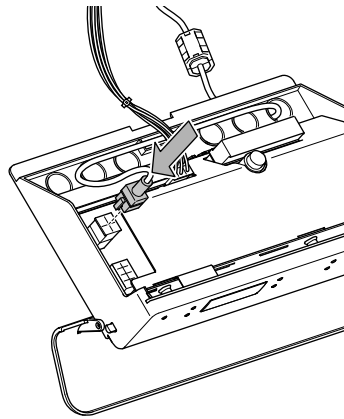


- 4 Put the (larger) boiler connector through the knockout hole. Fix the cable in the switch box by routing it behind the pre-mounted wires.

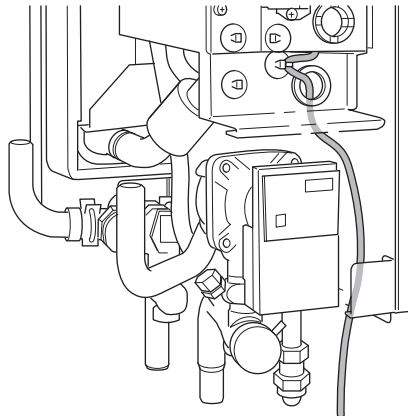


**a** Solenoid coil  
**b** Connector X5

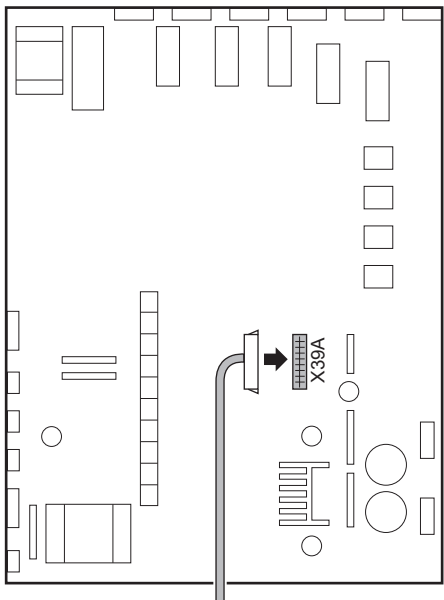
- 5** Plug the gas boiler connector into connector X5 of the gas boiler PCB. Make sure the solenoid coil is outside the gas boiler switch box.



- 6** Route the communication cable from the gas boiler to the indoor unit as in figure below.



- 7** Open the switch box cover of the indoor unit.
- 8** Plug the indoor unit connector into X39A of the indoor unit PCB.

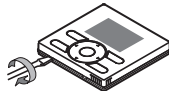


- 9** Close the switch box cover of the indoor unit.
- 10** Close the switch box cover of the gas boiler.
- 11** Close the gas boiler.

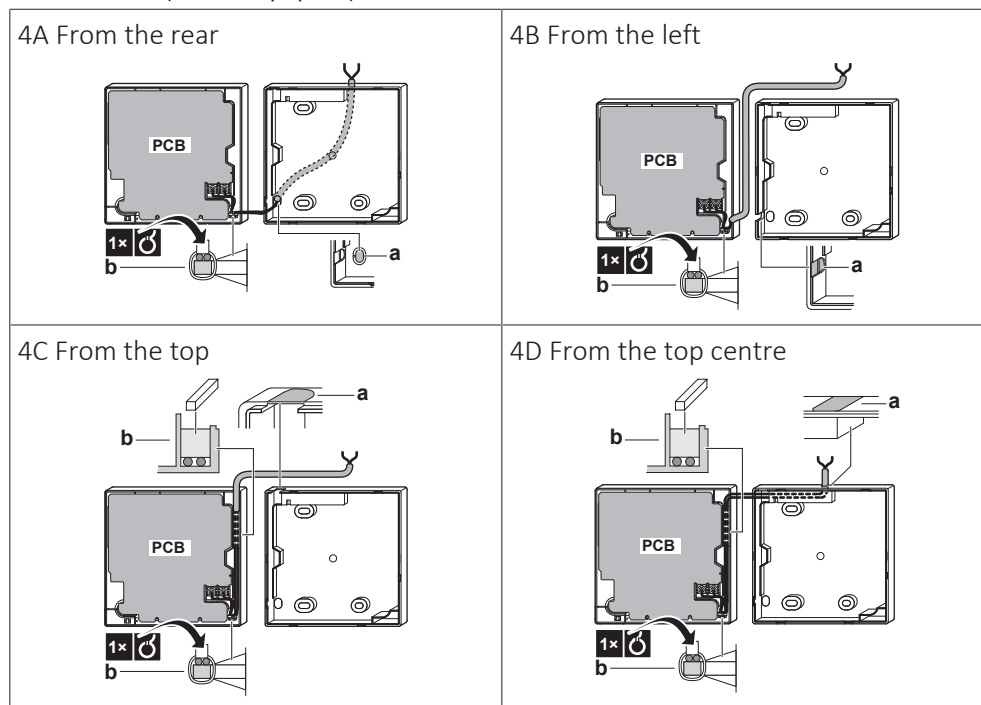
9.2.5 To connect the user interface

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

#	Action
1	<p>Connect the user interface cable to the indoor unit.</p> <p>Fix the cable with cable ties to the cable tie mountings.</p> <div></div> <p><b>a</b> Main user interface<sup>(a)</sup></p> <p><b>b</b> Optional user interface</p>

#	Action
2	<p>Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate.</p> <p>The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.</p> 
3	Fix the wallplate of the user interface to the wall.
4	Connect as shown in 4A, 4B, 4C or 4D.
5	<p>Reinstall the faceplate onto the wallplate.</p> <p>Be careful NOT to pinch the wiring when attaching the frontplate to the unit.</p>

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



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

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

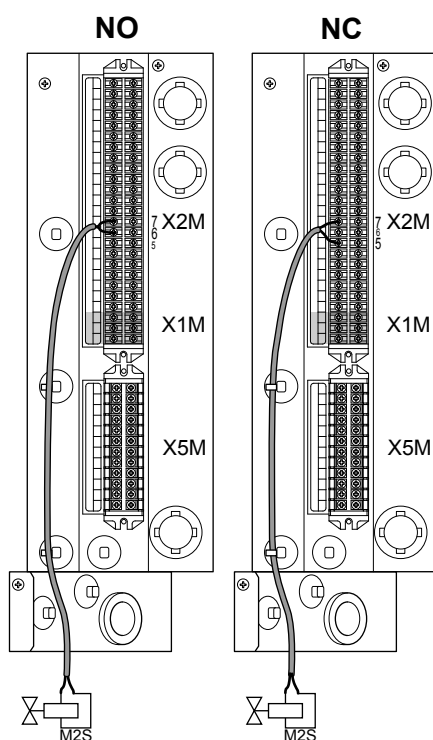
### 9.2.6 To connect the shut-off valve

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



#### NOTICE

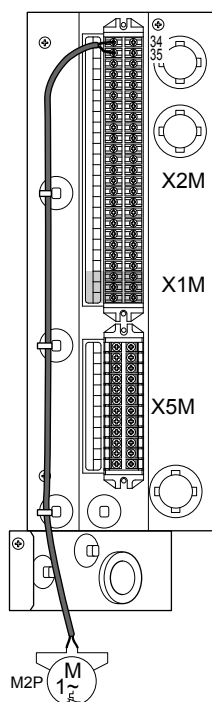
Wiring is different for a NC (normally closed) valve and a NO (normally open) valve.



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

### 9.2.7 To connect the domestic hot water pump

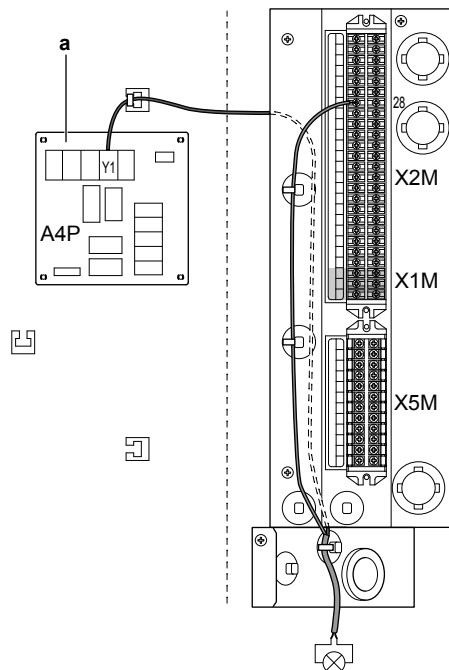
- 1 Connect the domestic hot water pump cable to the appropriate terminals as shown in the illustration below.



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

### 9.2.8 To connect the alarm output

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

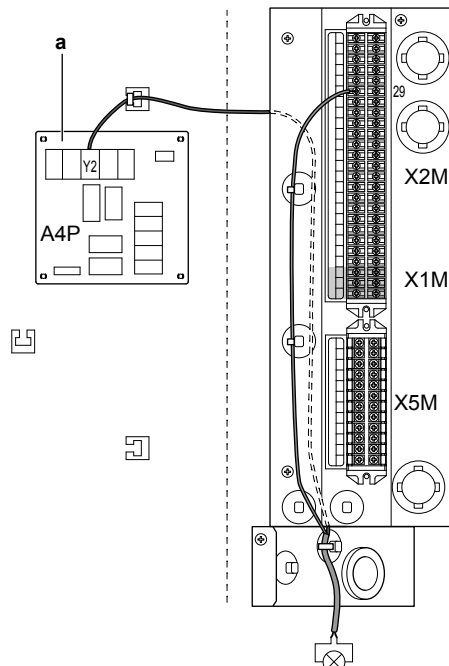


a Installation of EKR1HBAA is required.

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

#### 9.2.9 To connect the space heating ON/OFF output

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



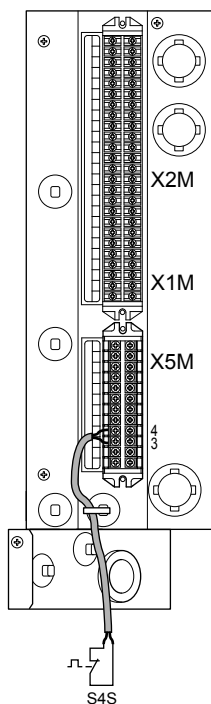
a Installation of EKR1HBAA is required.

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

#### 9.2.10 To connect the safety thermostat

**Note:** Safety thermostat = normally open contact.

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



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



### NOTICE

Make sure to select and install the safety thermostat according to the applicable legislation.

In any case, to prevent unnecessary tripping of the safety thermostat, we recommend the following:

- The safety thermostat is automatically resettable.
- The safety thermostat has a maximum temperature variation rate of 2°C/min.
- There is a minimum distance of 2 m between the safety thermostat and the motorized 3-way valve delivered with the domestic hot water tank.
- The safety thermostat setpoint is at least 15°C greater than the maximum leaving water temperature setpoint.



### INFORMATION

ALWAYS configure the safety thermostat after it is installed. Without configuration, the unit will ignore the safety thermostat contact.

# 10 Configuration



## INFORMATION

The purpose of hybrid for multi indoor unit in combination with multi outdoor unit is for heating only (space heating and DHW (by boiler only)). The target use of the direct expansion indoor unit (DX) in such a system is for cooling only. A combination of hybrid and DX, both in heating operation is NOT the main objective of such a system and hence, the heating comfort or continuous operation of the DX cannot be guaranteed over the complete operation range.



## INFORMATION

After direct expansion units (DX) have operated in cooling mode, the hybrid for multi indoor unit will not operate by heat pump for 72 hours. During this time, the gas boiler will take over the hybrid operation.

## In this chapter

10.1	Indoor unit .....	116
10.1.1	Overview: Configuration .....	116
10.1.2	Basic configuration .....	121
10.1.3	Advanced configuration/optimisation .....	135
10.1.4	Menu structure: Overview user settings .....	152
10.1.5	Menu structure: Overview installer settings .....	153
10.2	Gas boiler .....	155
10.2.1	Overview: Configuration .....	155
10.2.2	Basic configuration .....	155

## 10.1 Indoor unit

### 10.1.1 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	<p><b>First time – Quick wizard.</b> 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.</p> <p><b>Afterwards.</b> If necessary, you can make changes to the configuration afterwards.</p>
Configuring via the PC configurator	<p>You can prepare the configuration off-site on PC and afterwards upload the configuration to the system with the PC configurator.</p> <p>See also: "<a href="#">To connect the PC cable to the switch box</a>" [<a href="#">▶ 117</a>].</p>



**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 <b>menu structure</b> .	<b>#</b> For example: [A.2.1.7]
Accessing settings via the code in the <b>overview settings</b> .	<b>Code</b> For example: [C-07]

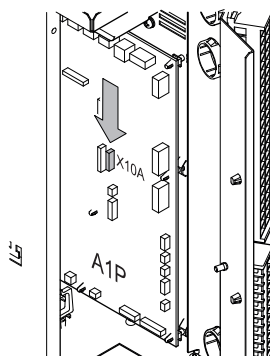
See also:

- ["To access the installer settings" \[▶ 118\]](#)
- ["10.1.5 Menu structure: Overview installer settings" \[▶ 153\]](#)

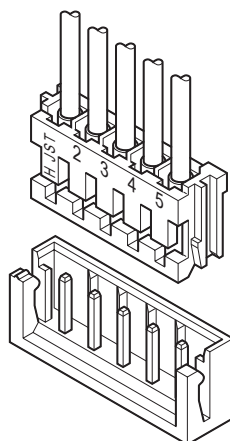
**To connect the PC cable to the switch box**

**Prerequisite:** The EKPCCAB4 kit is required.

- 1 Connect the USB connector of the cable to your PC.
- 2 Connect the plug of the cable to X10A on A1P of the switch box of the indoor unit.




- 3 Pay special attention to the position of the plug!




### 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

**Prerequisite:** Your user permission level is **Adv. end user**.


- 1 Go to [6.4]:  > **Information** > **User permission level**.
- 2 Press  for more than 4 seconds.

**Result:** Your user permission level is now **Installer**. The home pages display .





#### INFORMATION

The **Installer** permission level switches automatically back to **End user** in the following cases:

- If you press  again for more than 4 seconds, or
- If you do NOT press any button for more than 1 hour

#### 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:** Your user permission level is now **Adv. end user**. The user interface displays additional information and a "+" is added to the menu title. The user permission level stays in **Adv. end user** until manually set otherwise.




#### To set the user permission level to End user

- 1 Press  for more than 4 seconds.

**Result:** Your user permission level is now **End user**. The user interface displays the default home page.

#### 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 (in this example [1-01]) 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 "01".

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

- 3 Go to the corresponding second part of the setting (in this example [1-01]) by using the and button.

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

**Result:** The value to be modified is now highlighted.

- 4 Modify the value by using the and button.

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

- 5 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.

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

**Result:** The system will restart.

### 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 Turn on the unit.

**Result:** When turned on for the first time, both user interfaces display:

U5:Auto address		Tue 15:10
Push 4 sec. to continue		

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

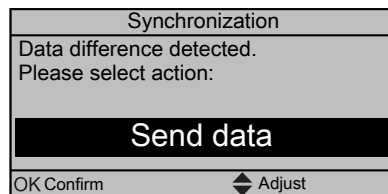
**Result:** This user interface is now the main user interface.

**INFORMATION**

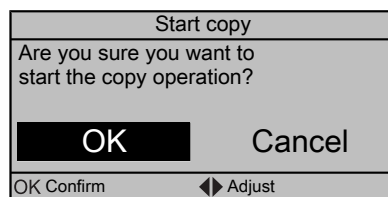
While using the quick wizard on the main user interface, the second user interface displays **Busy** and you cannot interact with it.

- 3 On the display, check if there is a data difference between both user interfaces.

**Result:** For proper operation of the system, the local data on both user interfaces must be the same. If they contain different data, both user interfaces will display:



- 4 To make the data equal on both user interfaces, select the required action:
  - **Send data:** the user interface you are operating contains the correct data. Copy this data to the other user interface.
  - **Receive data:** the user interface you are operating does NOT contain the correct data. Copy the data of the other user interface to this user interface.
- 5 Confirm to proceed.



- 6 Push **OK** to confirm the displayed selection of data.

**Result:** All data (languages, schedules etc.) will be copied from the selected source user interface to the other one. When done, the system is ready to be operated via both user interfaces.

**INFORMATION**

- As long as data is being copied, you cannot operate the user interfaces.
- Copying data can take up to 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 of the main user interface.

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

See ["To copy the system settings from the first to the second user interface" \[▶ 119\]](#).

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

After first power ON of the system, a quick wizard guides you through the initial configuration of the following system settings:

- language
- date
- time
- system layout

After you confirmed the system layout, you can proceed with the installation and commissioning of the system.

- 1 At power ON and as long as the system layout was not confirmed yet, select your preferred language.

The screen displays the title 'Language' and the instruction 'Select the desired language'. Below the instruction is a large black rectangular button. At the bottom, there are two controls: 'OK Confirm' and a diamond-shaped 'Adjust' button.

- 2 Set the current date and time.

The screen displays the title 'Date' and the instruction 'What is the date today?'. The date 'Tue 1 Jan 2023' is shown in the center. At the bottom, there are three controls: 'OK Confirm', a diamond-shaped 'Adjust' button, and a double-headed arrow 'Scroll' button.

The screen displays the title 'Time' and the instruction 'What is the current time?'. The time '00 : 00' is shown in the center. At the bottom, there are three controls: 'OK Confirm', a diamond-shaped 'Adjust' button, and a double-headed arrow 'Scroll' button.

- 3 Set the system layout settings: **Standard, Options, Capacities**. For more details, see "[10.1.2 Basic configuration](#)" [▶ 121].

The screen displays the title 'A.2 System layout' and the number '1' in the top right corner. A list of options is shown: 'Standard' (highlighted with a black bar), 'Options', 'Capacities', and 'Confirm layout'. At the bottom, there are two controls: 'OK Select' and a diamond-shaped 'Scroll' button.

- 4 After configuration, select **Confirm layout** and press **OK**.

The screen displays the title 'Confirm layout' and the instruction 'Please confirm the system layout. The system will restart and will be ready for first startup.' Below the instruction are two large buttons: 'OK' (highlighted with a black bar) and 'Cancel'. At the bottom, there are two controls: 'OK Confirm' and a diamond-shaped 'Adjust' button.

**Result:** The user interface reinitializes.

- 5 Proceed with the configuration of the system. When done, confirm the configuration settings.

**Result:** The screen shortly turns OFF and **Busy** is displayed for several seconds.

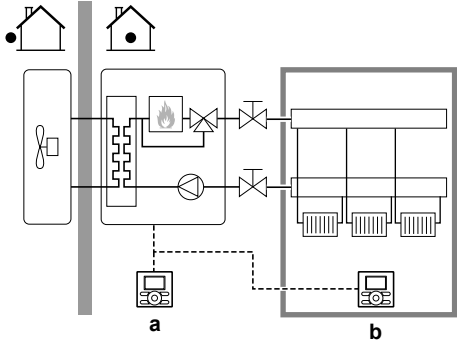
### 10.1.2 Basic configuration

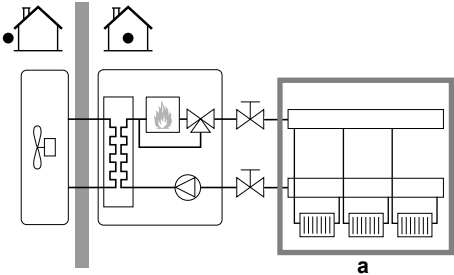
#### Quick wizard: Language / time and date

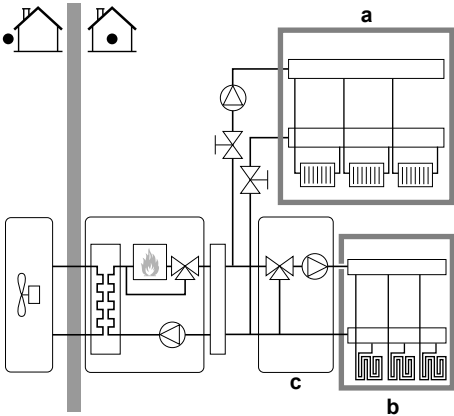
#	Code	Description
[A.1]	N/A	Language
[1]	N/A	Time and date

**Quick wizard: Standard****Space heating settings**

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

#	Code	Description
[A.2.1.7]	[C-07]	<p>Unit temperature control:</p> <ul style="list-style-type: none"> <li>0 (<b>LWT control</b>): Not applicable.</li> <li>1 (<b>Ext RT control</b>): Unit operation is decided by the external thermostat or equivalent (e.g. heat pump convector).</li> <li>2 (<b>RT control</b>)(default): Unit operation is decided based on the ambient temperature of the user interface.</li> </ul>
[A.2.1.B]	N/A	<p>Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):</p>  <ul style="list-style-type: none"> <li>a: At unit</li> <li>b: In room as room thermostat</li> </ul> <p><b>User interface location:</b></p> <ul style="list-style-type: none"> <li><b>At unit:</b> this user interface is used to control the unit. The other user interface is automatically set to <b>In room</b>.</li> <li><b>In room</b> (default): this user interface acts as room thermostat. The other user interface is automatically set to <b>At unit</b></li> </ul>

#	Code	Description
[A.2.1.8]	[7-02]	<p>The system can supply leaving water to up to 2 water temperature zones. During configuration, the number of water zones must be set.</p> <p><b>Number of LWT zones:</b></p> <ul style="list-style-type: none"> <li>0 (1 LWT zone)(default): Only 1 leaving water temperature zone. This zone is called the main leaving water temperature zone.</li> </ul>  <ul style="list-style-type: none"> <li>a: Main LWT zone</li> </ul> <p style="text-align: right;">continued &gt;&gt;</p>

#	Code	Description
[A.2.1.8]	[7-02]	<p>&lt;&lt; continuation</p> <ul style="list-style-type: none"> <li>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.</li> </ul>  <ul style="list-style-type: none"> <li>a: Add LWT zone</li> <li>b: Main LWT zone</li> <li>c: Mixing station</li> </ul>

#	Code	Description
[A.2.1.9]	[F-0D]	<p>When the space heating control is OFF by the user interface, the pump is always OFF, unless pump operation is required due to safety precautions. When the space heating control is On, you can select the desired pump operation mode (only applicable during space heating)</p> <p><b>Pump operation mode:</b></p> <ul style="list-style-type: none"> <li>0 (Continuous): Not applicable.</li> <li>1 (Sample): Not applicable.</li> </ul> <p style="text-align: right;">continued &gt;&gt;</p>
#	Code	Description
[A.2.1.9]	[F-0D]	<p>&lt;&lt; continuation</p> <ul style="list-style-type: none"> <li>2 (Request)(default): Pump operation based on request. <b>Example:</b> Using a room thermostat creates thermo ON/OFF condition. When there is no such demand, the pump is OFF.</li> </ul> <ul style="list-style-type: none"> <li>- a: Space heating control (user interface)</li> <li>- b: OFF</li> <li>- c: On</li> <li>- d: Heating demand (by ext RT or RT)</li> <li>- e: Pump operation</li> </ul>

### Quick wizard: Options

#### Domestic hot water settings

Following settings must be made accordingly.

#	Code	Description
[A.2.2.1]	[E-05]	<p>Domestic hot water preparation:</p> <ul style="list-style-type: none"> <li>0 (No): NOT possible</li> <li>1 (Yes)(default): Possible</li> </ul>
[A.2.2.2]	[E-06]	<p>Domestic hot water tank installed in the system?</p> <ul style="list-style-type: none"> <li>0 (No)(default): the domestic hot water will be produced by the boiler when there is a demand.</li> <li>1 (Yes): the domestic hot water will be produced by the tank.</li> </ul> <p><b>Note:</b> For Switzerland, setting MUST be "1".</p>



#	Code	Description
[A.2.2.3]	[E-07]	<p>What kind of domestic hot water tank is installed?</p> <ul style="list-style-type: none"> <li>4 (<b>Type 5</b>). EKHWP.</li> <li>6 (<b>Type 7</b>) Third-party tank.</li> </ul> <p>Range: 0~6.</p>
[A.2.2.A]	[D-02]	<p>In case a tank is installed, the indoor unit offers the possibility to connect a field supplied domestic hot water pump (On/OFF type). Depending on the installation and configuration on the user interface, we distinguish its functionality. Not applicable for Switzerland.</p> <p>In case of [E-06]=0</p> <ul style="list-style-type: none"> <li>0 (<b>No</b>)(default): NOT installed</li> <li>1 (<b>Secondary rtrn</b>): Installed for instant hot water when hot water is tapped. The end-user sets the operation timing (weekly schedule time of the domestic hot water pump when it should run. Control of this pump is possible through the indoor unit. The target temperature of the recirculation function is a minimum of 45°C, or the domestic hot water setpoint set in the domestic hot water home screen (provided it is &gt;45°C).</li> </ul> <p>In case of [E-06]=1</p> <ul style="list-style-type: none"> <li>0 (<b>No</b>)(default): NOT installed</li> <li>1 (<b>Secondary rtrn</b>): Installed for instant hot water when water is tapped. The end-user sets the operation timing (weekly schedule time) of the domestic hot water pump when it should run. Control of this pump is possible through the indoor unit.</li> <li>2 (<b>Disinf. shunt</b>): Installed for disinfection. It runs when the disinfection function of the domestic hot water function is running. No further settings are needed.</li> </ul> <p>See also illustrations below.</p>

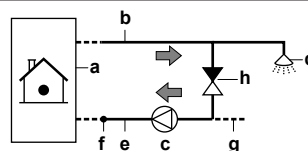
**NOTICE**

If a domestic hot water pump for instant hot water is present in the system ([D-02]=1), scaling of the boiler heat exchanger can occur faster due to more frequent domestic hot water operation.

**In case of [E-06]=0****INFORMATION**

Not applicable for Switzerland.

### Domestic hot water pump installed for instant hot water

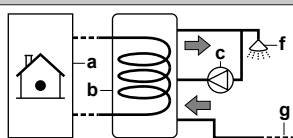


- a Indoor unit
- b Hot water connection on boiler
- c Domestic hot water pump (field supply)
- d Shower (field supply)
- e Inlet on boiler
- f Recirculation thermistor (EKTH2) (field supply)
- g Water supply
- h Non-return valve (field supply)

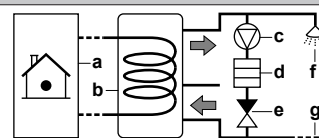
In case of [E-06]=1

### Domestic hot water pump installed for...

#### Instant hot water



#### Disinfection



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

### Thermostats and external sensors

#	Code	Description
[A.2.2.4]	[C-05]	<p><b>Contact type main</b></p> <p>In external room thermostat control, the contact type of the optional room thermostat or heat pump convector for the main leaving water temperature zone must be set.</p> <ul style="list-style-type: none"> <li>1 (<b>Thermo ON/OFF</b>): The connected external room thermostat or heat pump convector sends the heating demand by the same signal as it is connected to only 1 digital input (preserved for the main leaving water temperature zone) on the indoor unit (X2M/1). Select this value in case of a connection to the heat pump convector (FWXV).</li> <li>2 (<b>H/C request</b>)(default): The connected external room thermostat sends separate heating demand and is therefore connected to the 2 digital input (preserved for the main leaving water temperature zone) on the indoor unit (X2M/1 and 2). Select this value in case of connection with the wired (EKRTWA) or wireless (EKTR1) room thermostat.</li> </ul> <p><b>Remark:</b> Only possible to use as a heating application.</p>

#	Code	Description
[A.2.2.5]	[C-06]	<b>Contact type add.</b> 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. <ul style="list-style-type: none"> <li>1 (Thermo ON/OFF): See <b>Contact type main</b>. Connected on the indoor unit (X2M/1a).</li> <li>2 (H/C request)(default): See <b>Contact type main</b>. Connected on the indoor unit (X2M/1a and 2a).</li> </ul>
[A.2.2.B]	[C-08]	<b>External sensor</b> When an optional external ambient sensor is connected, the type of the sensor must be set. <ul style="list-style-type: none"> <li>0 (No)(default): NOT installed. The thermistor in the user interface and in the outdoor unit are used for measurement.</li> <li>1 (Outdoor sensor): Installed. The outdoor sensor will be used to measure the outdoor ambient temperature. <b>Remark:</b> For some functionality, the temperature sensor in the outdoor unit is still used.</li> <li>2 (Room sensor): Installed. The temperature sensor in the user interface is NOT used anymore. <b>Remark:</b> This value has only meaning in room thermostat control.</li> </ul>

### Digital I/O PCB

Modification of these settings is only needed when the optional digital I/O PCB is installed. The digital I/O PCB has multiple functionality which need to be configured.

#	Code	Description
[A.2.2.6.2]	[D-07]	<b>Solar kit</b> Indicates if the domestic hot water tank is also heated by thermal solar panels. <ul style="list-style-type: none"> <li>0 (No)(default): NOT installed.</li> <li>1 (Yes): Installed. The domestic hot water tank can –besides by the boiler– also be heated by thermal solar panels. Set this value if thermal solar panels are installed.</li> </ul>

#	Code	Description
[A.2.2.6.3]	[C-09]	<b>Alarm output</b> Indicates the logic of the alarm output on the digital I/O PCB during malfunctioning. <ul style="list-style-type: none"> <li>0 (<b>Normally open</b>): The alarm output will be powered when an alarm occurs. By setting this value, a distinction is made between the detection of an alarm, and the detection of a power failure.</li> <li>1 (<b>Normally closed</b>): The alarm output will NOT be powered when an alarm occurs.</li> </ul> See also table below (Alarm output logic).

#### Alarm output logic

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

#### Savings mode

The user can choose whether switching between operation modes is either economically or ecologically optimised. Set to **Economical**, the system will in all operating conditions select the energy source (gas or electricity) based on energy prices, resulting in a minimisation of energy costs. Set to **Ecological**, the heat source will be selected based on ecological parameters, resulting in a minimisation of primary energy consumption.

#	Code	Description
[A.6.7]	[7-04]	Defines whether switching between operation modes is either economically or ecologically optimised. <ul style="list-style-type: none"> <li>0 (<b>Economical</b>)(default): reduction of energy costs</li> <li>1 (<b>Ecological</b>): reduction of primary energy consumption, but not necessarily energy costs</li> </ul>

#### Primary energy factor

The primary energy factor indicates how many units of primary energy (natural gas, crude oil, or other fossil fuels, prior to undergoing any human-made conversions or transformations) are needed to obtain 1 unit of a certain (secondary) energy source, such as electricity. The primary energy factor for natural gas is 1. Assuming an average electricity production efficiency (including transportation losses) of 40%, the primary energy factor for electricity equals 2.5 (=1/0.40). The primary energy factor allows you to compare 2 different energy sources. In this case, the primary energy use of the heat pump is compared to the natural gas use of the gas boiler.

#	Code	Description
N/A	[7-03]	Compares the primary energy use of the heat pump with that of the boiler. Range: 0~6, step: 0.1 (default: 2.5)

**INFORMATION**

- The primary energy factor can always be set, but is only used in case the savings mode is set to **Ecological**.
- To set electricity price values, do NOT use overview settings. Set them in the menu structure instead ([7.4.5.1], [7.4.5.2], and [7.4.5.3]). For more information on how to set the energy prices, see the operation manual and the user reference guide.

**Space heating control**

The basic required settings in order to configure the space heating of your system are described in this chapter. The weather-dependent installer settings define the parameters for the weather-dependent operation of the unit. When weather-dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature. Low outdoor temperatures will result in warmer water and vice versa. During weather-dependent operation, the user has the possibility to shift up or down the target water temperature by a maximum of 10°C.

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

**Leaving water temperature: Main zone**

#	Code	Description
[A.3.1.1.1]	N/A	<b>LWT setpoint mode:</b> <ul style="list-style-type: none"> <li>▪ <b>Fixed:</b> The desired leaving water temperature is: <ul style="list-style-type: none"> <li>- NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature)</li> <li>- fixed in time (i.e., NOT scheduled)</li> </ul> </li> <li>▪ <b>Weather dep. (default):</b> The desired leaving water temperature is: <ul style="list-style-type: none"> <li>- weather-dependent (i.e. depends on the outdoor ambient temperature)</li> <li>- fixed in time (i.e., NOT scheduled)</li> </ul> </li> </ul>

#	Code	Description
[7.7.1.1]	[1-00] [1-01] [1-02] [1-03]	<b>Set weather-dependent heating:</b> <ul style="list-style-type: none"> <li>▪ <math>T_t</math>: Target leaving water temperature (main)</li> <li>▪ <math>T_a</math>: Outdoor temperature</li> </ul> <p style="text-align: right;">continued &gt;&gt;</p>

#	Code	Description
[7.7.1.1]	[1-00] [1-01] [1-02] [1-03]	<p>&lt;&lt; continuation</p> <ul style="list-style-type: none"> <li>▪ [1-00]: Low outdoor ambient temperature. <math>-40^{\circ}\text{C} \sim +5^{\circ}\text{C}</math> (default: <math>-10^{\circ}\text{C}</math>)</li> <li>▪ [1-01]: High outdoor ambient temperature. <math>10^{\circ}\text{C} \sim 25^{\circ}\text{C}</math> (default: <math>15^{\circ}\text{C}</math>).</li> <li>▪ [1-02]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. <math>[9-01]^{\circ}\text{C} \sim [9-00]^{\circ}\text{C}</math> (default: <math>60^{\circ}\text{C}</math>).</li> </ul> <p><b>Note:</b> This value should be higher than [1-03] as for low outdoor temperatures warmer water is required.</p> <ul style="list-style-type: none"> <li>▪ [1-03]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. <math>[9-01]^{\circ}\text{C} \sim \min(45, [9-00])^{\circ}\text{C}</math> (default: <math>35^{\circ}\text{C}</math>).</li> </ul> <p><b>Note:</b> This value should be lower than [1-02] as for high outdoor temperatures less warm water is required.</p>

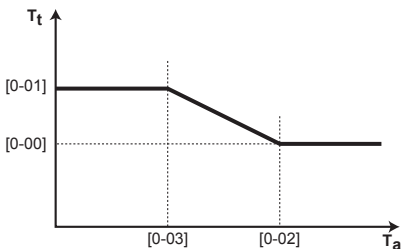
**INFORMATION**

In order to optimise comfort as well as running costs, it is recommended to choose weather-dependent setpoint operation. Set the settings carefully; they have significant influence on heat pump as well as boiler operation. Too high leaving water temperature can result in constant boiler operation.

**Leaving water temperature: Additional zone**

Only applicable if 2 leaving water temperature zones are present.

#	Code	Description
[A.3.1.2.1]	N/A	<p><b>LWT setpoint mode:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Fixed:</b> The desired leaving water temperature is: <ul style="list-style-type: none"> <li>- NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature)</li> <li>- fixed in time (i.e., NOT scheduled)</li> </ul> </li> <li>▪ <b>Weather dep. (default):</b> The desired leaving water temperature is: <ul style="list-style-type: none"> <li>- weather-dependent (i.e. depends on the outdoor ambient temperature)</li> <li>- fixed in time (i.e., NOT scheduled)</li> </ul> </li> </ul>

#	Code	Description
[7.7.2.1]	[0-00] [0-01] [0-02] [0-03]	<p>Set weather-dependent heating:</p>  <ul style="list-style-type: none"> <li>▪ <math>T_t</math>: Target leaving water temperature (additional)</li> <li>▪ <math>T_a</math>: Outdoor temperature</li> </ul> <p>continued &gt;&gt;</p>
#	Code	Description
[7.7.2.1]	[0-00] [0-01] [0-02] [0-03]	<p>&lt;&lt; continuation</p> <ul style="list-style-type: none"> <li>▪ [0-03]: Low outdoor ambient temperature. <math>-40^{\circ}\text{C} \sim +5^{\circ}\text{C}</math> (default: <math>-10^{\circ}\text{C}</math>).</li> <li>▪ [0-02]: High outdoor ambient temperature. <math>10^{\circ}\text{C} \sim 25^{\circ}\text{C}</math> (default: <math>15^{\circ}\text{C}</math>).</li> <li>▪ [0-01]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. <math>[9-05]^{\circ}\text{C} \sim [9-06]^{\circ}\text{C}</math> (default: <math>60^{\circ}\text{C}</math>).</li> </ul> <p><b>Note:</b> This value should be higher than [0-00] as for low outdoor temperatures warmer water is required.</p> <ul style="list-style-type: none"> <li>▪ [0-00]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. <math>[9-05]^{\circ}\text{C} \sim \min(45, [9-06])^{\circ}\text{C}</math> (default: <math>35^{\circ}\text{C}</math>).</li> </ul> <p><b>Note:</b> This value should be lower than [0-01] as for high outdoor temperatures less warm water is required.</p>

### Pump control: Flow target

The hybrid module is designed to operate with a fixed flow. This means that the pump is controlled to work at a flow target set by the installer. The installer can set the flow target for:

- heat pump only operation,
- hybrid operation,
- gas boiler only operation.

#	Code	Description
N/A	[8-0B]	<p>Target flow rate during heat pump operation.</p> <p>The default value is set to deliver the nominal capacity of the heat pump with a <math>\Delta T</math> over the emitter of 5°C. Decrease this value if the room temperature is constantly higher than the desired room temperature. Increase this value if you feel discomfort in heat pump only operation.</p> <p>Range: 10~20 l/min</p> <ul style="list-style-type: none"> <li>For CHYHBH05: 13 l/min (default)</li> <li>For CHYHBH08: 15 l/min (default)</li> </ul> <p>The default values have been set to optimise comfort and performance. Take care when changing them.</p>
N/A	[8-0C]	<p>Target flow rate during hybrid operation.</p> <p>The default value is chosen the same as the target flow rate during boiler operation. Decrease this value if the room temperature is constantly higher than the desired room temperature. Increase this value if you feel discomfort in hybrid operation.</p> <p>Range: 10~20 l/min</p> <ul style="list-style-type: none"> <li>For CHYHBH05: 13 l/min (default)</li> <li>For CHYHBH08: 15 l/min (default)</li> </ul> <p>The default values have been set to optimise comfort and performance. Take care when changing them.</p>
N/A	[8-0D]	<p>Target flow rate during gas boiler operation.</p> <p>The default value is chosen to deliver the nominal capacity of the gas boiler with a <math>\Delta T</math> over the emitter of 20°C. Decrease this value if the room temperature is constantly higher than the desired room temperature. Increase this value if you feel discomfort in gas boiler only operation.</p> <p>10~20 l/min (default: 16 l/min)</p> <p>The default value has been set to optimise comfort and performance. Take care when changing them.</p>

### Leaving water temperature: Modulation

Modulation lowers or raises the desired leaving water temperature in function of the desired room temperature and the difference between this temperature and the actual room temperature. This results in:

- stable room temperatures exactly matching the desired temperature (high comfort level),
- less On/OFF cycles (low noise level, high comfort and efficiency levels)
- as low as possible leaving water temperatures (high efficiency).



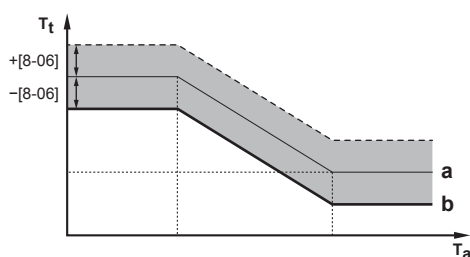
This function is only applicable in case of room thermostat control and is used to calculate the leaving water temperature. After activation, the leaving water temperature can only be read on the user interface, but not changed. Turn OFF modulation to change it. The leaving water temperature can either be a fixed setpoint, or an offset in case of weather-dependent setpoint.

#	Code	Description
[A.3.1.1.5]	[8-05]	<b>Modulated LWT:</b> <ul style="list-style-type: none"> <li>▪ <b>No:</b> disabled.  <b>Note:</b> The desired leaving water temperature needs to be set on the user interface.</li> <li>▪ <b>Yes (default):</b> enabled.  <b>Note:</b> The desired leaving water temperature can only be read out on the user interface</li> </ul>
N/A	[8-06]	Leaving water temperature maximum modulation: 0°C~10°C (default: 5°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 temperature setpoint. By setting the weather-dependent curve to a higher position, it cannot drop below the minimum setpoint. See the illustration below.



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

#### Leaving water temperature: Emitter type

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

**Note:** The setting of the emitter type will influence the maximum modulation of the desired leaving water temperature and the possibility for usage of the automatic 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]	<b>Emitter type:</b> Reaction time of the system: <ul style="list-style-type: none"> <li>▪ <b>Quick</b> (default) <b>Example:</b> Small water volume, fan coils, or radiators.</li> <li>▪ <b>Slow</b> <b>Example:</b> Large water volume, floor heating loops.</li> </ul>

### Quick heat up function

Only applicable in case of room thermostat control. The function will start up the gas boiler when the actual room temperature is 3°C lower than the desired room temperature. The large boiler capacity can boost up the room temperature quickly to the desired temperature. This can be useful after a long period of absence or after a break-down of the system. During the quick heat up function, the setpoint of the gas boiler will be the maximum heating setpoint: [9-00].

#	Code	Description
N/A	[C-0A]	Indoor quick heat up function <ul style="list-style-type: none"> <li>▪ 0: <b>OFF</b>.</li> <li>▪ 1 (default): <b>On</b>.</li> </ul>

### Domestic hot water control

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

This is always applicable for Switzerland.

### 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]	<b>Domestic hot water Type:</b> <ul style="list-style-type: none"> <li>▪ 0 (<b>Reheat only</b>): Only reheat operation is allowed.</li> <li>▪ 1 (<b>Reheat + sched.</b>): The domestic hot water tank is heated according to a schedule and between the scheduled heatup cycles, reheat operation is allowed.</li> <li>▪ 2 (<b>Scheduled only</b>)(default): The domestic hot water tank can <b>ONLY</b> be heated according to a schedule.</li> </ul>

See "[Domestic hot water control: advanced](#)" [▶ 142] for more details.



#### INFORMATION

If a third-party tank is present in the system ([E-07]=6), it is recommended to set [6-0D] to "0" (i.e. **Reheat only**).

### Maximum DHW temperature setpoint

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

**INFORMATION**

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

**INFORMATION**

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

#	Code	Description
[A.4.5]	[6-0E]	<b>Maximum setpoint</b> 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. In case of [E-06]=1 (tank installed): <ul style="list-style-type: none"> <li>▪ [E-07]≠6: 40~75°C (default: 75°C)</li> <li>▪ [E-07]=6: 40~60°C (default: 60°C)</li> </ul> In case of [E-06]=0 (no tank installed): <ul style="list-style-type: none"> <li>▪ 40~65°C (default: 65°C)</li> </ul>

**Contact/helpdesk number**

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

## 10.1.3 Advanced configuration/optimisation

**Space heating operation: advanced****Preset leaving water temperature**

You can define preset leaving water temperatures:

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

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

**NOTICE**

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

**NOTICE**

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

#	Code	Description
Preset leaving water temperature for the main leaving water temperature zone in case of NOT weather dependent		
[7.4.2.1]	[8-09]	<b>Comfort (heating)</b> [9-01]°C~[9-00]°C (default: 45°C)
[7.4.2.2]	[8-0A]	<b>Eco (heating)</b> [9-01]°C~[9-00]°C (default: 40°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	<b>Comfort (heating)</b> −10°C~+10°C (default: 0°C)
[7.4.2.6]	N/A	<b>Eco (heating)</b> −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 can be configured.

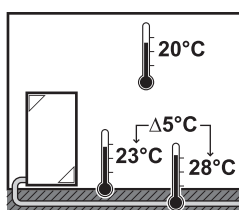
**NOTICE**

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

**NOTICE**

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

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



#	Code	Description
Leaving water temperature range for the main leaving water temperature zone (= the leaving water temperature zone with the lowest leaving water temperature in heating operation)		
[A.3.1.1.2.2]	[9-00]	<b>Maximum temp (heating)</b> 37°C~80°C (default: 80°C)
[A.3.1.1.2.1]	[9-01]	<b>Minimum temp (heating)</b> 15°C~37°C (default: 25°C)
Leaving water temperature range for the additional leaving water temperature zone (= the leaving water temperature zone with the highest leaving water temperature in heating operation)		
[A.3.1.2.2.2]	[9-06]	<b>Maximum temp (heating)</b> 37°C~80°C (default: 80°C)
[A.3.1.2.2.1]	[9-05]	<b>Minimum temp (heating)</b> 15°C~37°C (default: 25°C)

### Leaving water temperature overshoot temperature

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

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

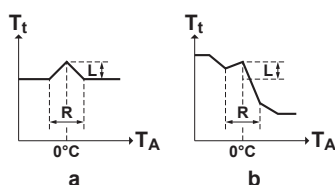


#### INFORMATION

This overshoot temperature applies to the heat pump leaving water temperature. Note that when the gas boiler is operating, there can be a 5°C overshoot over the desired boiler leaving water temperature.

### 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]	<ul style="list-style-type: none"> <li>0 (disabled) (default)</li> <li>1 (enabled) L=2°C, R=4°C (<math>-2^{\circ}\text{C} &lt; T_A &lt; 2^{\circ}\text{C}</math>)</li> <li>2 (enabled) L=4°C, R=4°C (<math>-2^{\circ}\text{C} &lt; T_A &lt; 2^{\circ}\text{C}</math>)</li> <li>3 (enabled) L=2°C, R=8°C (<math>-4^{\circ}\text{C} &lt; T_A &lt; 4^{\circ}\text{C}</math>)</li> <li>4 (enabled) L=4°C, R=8°C (<math>-4^{\circ}\text{C} &lt; T_A &lt; 4^{\circ}\text{C}</math>)</li> </ul>

#### 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: 5°C)

#### Temperature ranges (room temperature)

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



#### NOTICE

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

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

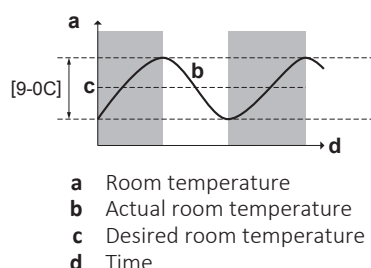
#### Room temperature step

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

#	Code	Description
[A.3.2.4]	N/A	<b>Room temp. step</b> <ul style="list-style-type: none"> <li>1°C (default). The desired room temperature on the user interface is settable per 1°C.</li> <li>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.</li> </ul>

### 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.



#	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
<b>Room temp. offset:</b> 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)
<b>Ext. room sensor offset:</b> 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: <ul style="list-style-type: none"> <li>Set [2-06] to "1"</li> <li>Set the room antifrost temperature ([2-05]).</li> </ul>

Unit control method ([C-07])	Room frost protection
External room thermostat control ([C-07]=1)	<p>Allow for the external room thermostat to take care of room frost protection:</p> <ul style="list-style-type: none"> <li>Turn ON the leaving water temperature home page.</li> </ul>

**NOTICE**

**Room frost protection.** Even if you turn OFF the leaving water temperature (main + additional) control via the home pages (LWT main + LWT add), room frost protection –if enabled– will remain active.

**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]	<b>Room frost protection</b> <ul style="list-style-type: none"> <li>0: disabled (default)</li> <li>1: enabled</li> </ul>
N/A	[2-05]	Room antifrost temperature 4°C~16°C (default: 8°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	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ul>
Two leaving water temperature zones	<ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>

### Shut-off valve

The following is only applicable in case of 2 leaving water temperature zones.

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



#### INFORMATION

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

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

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

#	Code	Description
[A.3.1.1.6.1]	[F-0B]	The shut-off valve: <ul style="list-style-type: none"> <li>0 (No)(default): is NOT influenced by heating demand.</li> <li>1 (Yes): closes when there is NO heating demand.</li> </ul>

**INFORMATION**

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

**Operation range**

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

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

#	Code	Description
[A.3.3.1]	[4-02]	<p>14°C~35°C (default: 25°C)</p> <p>Depending on [1-0A], the actual outdoor temperature will be averaged over the selected time period. Refer to "Average timer" ▶ 149.</p> <ul style="list-style-type: none"> <li>[4-02]&gt;25°C: heat pump will be prohibited when the outdoor temperature reaches [4-02]. This temperature can be different from the outdoor average temperature.</li> <li>[4-02]&lt;25°C and [1-0A]≠0: heat pump will be prohibited when the outdoor temperature reaches [4-02]. This temperature can be different from the actual outdoor temperature.</li> <li>[4-02]&lt;25°C and [1-0A]=0: heat pump will be prohibited when the outdoor temperature reaches [4-02]. There will be no average of the outdoor temperature.</li> </ul> <p>When the above cases occur, then the outdoor unit will still be able to operate for DX units.</p>

**Domestic hot water control: advanced****Preset tank temperatures**

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

You can define preset tank temperatures:

- storage economic
- storage comfort
- reheat
- reheat hysteresis

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

### Storage comfort

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

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

### Storage eco

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

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

### Reheat hysteresis

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

#	Code	Description
N/A	[6-08]	2°C~20°C default: 5°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	<p>Desired temperature mode:</p> <ul style="list-style-type: none"> <li>▪ <b>Fixed</b> (default): disabled. All desired tank temperature are NOT weather-dependent.</li> <li>▪ <b>Weather dep.:</b> 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.</li> </ul> <p><b>Note:</b> When the displayed tank temperature is weather-dependent, it cannot be adjusted on the user interface.</p>
[A.4.7]	[0-0E] [0-0D] [0-0C] [0-0B]	<p><b>Weather-dependent curve</b></p> <ul style="list-style-type: none"> <li>▪ <math>T_{DHW}</math>: The desired tank temperature.</li> <li>▪ <math>T_a</math>: The (averaged) outdoor ambient temperature</li> <li>▪ [0-0E]: low outdoor ambient temperature: <math>-40^{\circ}\text{C} \sim 5^{\circ}\text{C}</math> (default: <math>-10^{\circ}\text{C}</math>)</li> <li>▪ [0-0D]: high outdoor ambient temperature: <math>10^{\circ}\text{C} \sim 25^{\circ}\text{C}</math> (default: <math>15^{\circ}\text{C}</math>)</li> <li>▪ [0-0C]: desired tank temperature when the outdoor temperature equals or drops below the low ambient temperature: <math>45^{\circ}\text{C} \sim [6-0E]^{\circ}\text{C}</math> (default: <math>60^{\circ}\text{C}</math>)</li> <li>▪ [0-0B]: desired tank temperature when the outdoor temperature equals or rises above the high ambient temperature: <math>35^{\circ}\text{C} \sim [6-0E]^{\circ}\text{C}</math> (default: <math>55^{\circ}\text{C}</math>)</li> </ul>

### Timers for simultaneous request space and domestic hot water operation

When the unit starts heating the domestic hot water tank, it continues until the setpoint has been reached. However, if it takes too long (decided by the unit), the unit will balance between heating of the domestic hot water tank and space heating.

### 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.

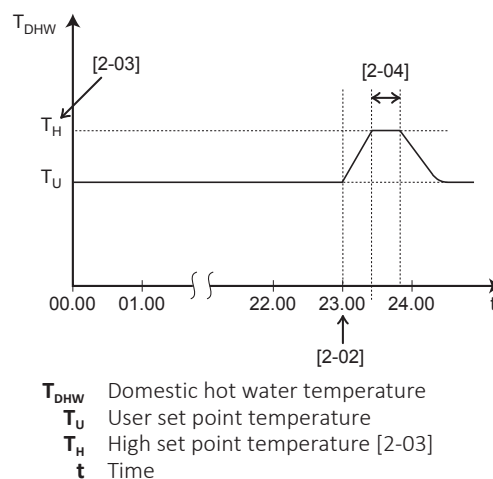
**CAUTION**

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

**CAUTION**

Make sure to activate the disinfection function when a third-party tank is installed.

#	Code	Description
[A.4.4.2]	[2-00]	<b>Operation day:</b> <ul style="list-style-type: none"> <li>0: Each day</li> <li>1: Monday</li> <li>2: Tuesday</li> <li>3: Wednesday</li> <li>4: Thursday</li> <li>5: Friday (default)</li> <li>6: Saturday</li> <li>7: Sunday</li> </ul>
[A.4.4.1]	[2-01]	<b>Disinfection</b> <ul style="list-style-type: none"> <li>0: No (default)</li> <li>1: Yes</li> </ul>
[A.4.4.3]	[2-02]	<b>Start time:</b> 00~23:00, step: 1:00 (default: 23:00).
[A.4.4.4]	[2-03]	<b>Temperature target:</b> fixed value (default: 60°C)
[A.4.4.5]	[2-04]	<b>Duration</b> Range 40~60 minutes (default: 40 minutes)



**WARNING**

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

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

**CAUTION**

Make 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.

**NOTICE**

**Disinfection mode.** Even if you turn OFF domestic hot water operation via the DHW tank temperature home page (**Tank**), disinfection mode will remain active.

**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  $\phi$  to interrupt the disinfection.

## Heat source settings

### Auto emergency

When the heat pump fails to operate, the gas boiler can serve as an emergency back-up heater and either automatically or non-automatically take over the entire heat load.

- When auto emergency is set to **Automatic** and a heat pump failure occurs, the boiler will automatically take over the heat load.
- 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 the user to confirm whether the boiler can take over the entire heat load or not.

When the heat pump fails,  $\textcircled{1}$  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	<b>Emergency:</b> <ul style="list-style-type: none"> <li>▪ 0: <b>Manual</b> (default)</li> <li>▪ 1: <b>Automatic</b></li> </ul>

**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 following functions will remain active even if the user does NOT confirm emergency operation:

- Room frost protection
- Underfloor heating screed dryout
- Water pipe freeze prevention

However, the disinfection function will be activated **ONLY** if the user confirms emergency operation via the user interface.

**Equilibrium temperature**

Based on the ambient temperature, energy prices and the required leaving water temperature, the user interface is able to calculate which heat source can deliver the required heating capacity most efficiently. However, to maximise the energy output of the heat pump, it is possible to prevent the gas boiler from operating when the ambient temperature exceeds a certain point (e.g. 5°C). This can be useful to avoid too much gas boiler operation in case of incorrect settings. When an equilibrium temperature is set, domestic hot water operation is **NEVER** prohibited.

#	Code	Description
N/A	[5-00]	Equilibrium. Deactivate the gas boiler above the equilibrium temperature for space heating? ▪ 0: No (default) ▪ 1: Yes
N/A	[5-01]	<b>Equilibrium temp.</b> When the ambient temperature is higher than this temperature, the gas boiler is NOT allowed to work. Only applicable if [5-00] is set to 1. Range -15°C~35°C (default: 5°C)

**INFORMATION**

In case that the actual outdoor temperature is lower than [5-01] and there is a DX operating request, the heat pump will be prohibited to give priority to DX units. In this case, heating can only be provided by the gas boiler. If there is only a request of the hybrid indoor unit (no DX request), then the heat pump and gas boiler will both be able to work below this equilibrium if they are required.

**System settings****Priorities****For systems with an integrated domestic hot water tank**

#	Code	Description
N/A	[5-02]	<p>Space heating priority.</p> <p>Defines whether backup heater will assist the heat pump during domestic hot water operation.</p> <p>Consequence: Shorter tank heating operation time and shorter interruption of the space heating cycle.</p> <p>This setting <b>MUST</b> always be 1.</p> <p>[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].</p> <p>If the backup heater operation is limited ([4-00]=0) and the outdoor temperature is lower than setting [5-03], the domestic hot water will not be heated with the backup heater.</p>
N/A	[5-03]	<p>Space heating priority temperature.</p> <p>Defines the outdoor temperature which below the backup heater will assist during domestic hot water heating.</p>
N/A	[5-04]	<p>Setpoint correction for domestic hot water temperature.</p> <p>Setpoint correction for the domestic hot water temperature, to be applied at low outdoor temperature when space heating priority is enabled. The corrected (higher) setpoint 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.</p> <p>Range: 0°C~20°C</p>

### Auto-restart

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

#	Code	Description
[A.6.1]	[3-00]	<p>Is the auto restart function of the unit allowed?</p> <ul style="list-style-type: none"> <li>▪ 0: <b>No</b></li> <li>▪ 1 (default): <b>Yes</b></li> </ul>



### Safety thermostat

#	Code	Description
[A.2.1.6]	[D-01]	Connection to a safety thermostat voltage free contact: <ul style="list-style-type: none"> <li>0 (default): No safety thermostat.</li> <li>3: Safety thermostat normal closed contact.</li> </ul>



#### INFORMATION

Make sure the safety thermostat setpoint is at least 15°C greater than the maximum leaving water temperature setpoint.

### Average timer

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

The outdoor temperature is averaged over the selected time period.

#	Code	Description
[A.6.4]	[1-0A]	Outdoor average timer: <ul style="list-style-type: none"> <li>0: No averaging</li> <li>1: 12 hours (default)</li> <li>2: 24 hours</li> <li>3: 48 hours</li> <li>4: 72 hours</li> </ul>

### 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)

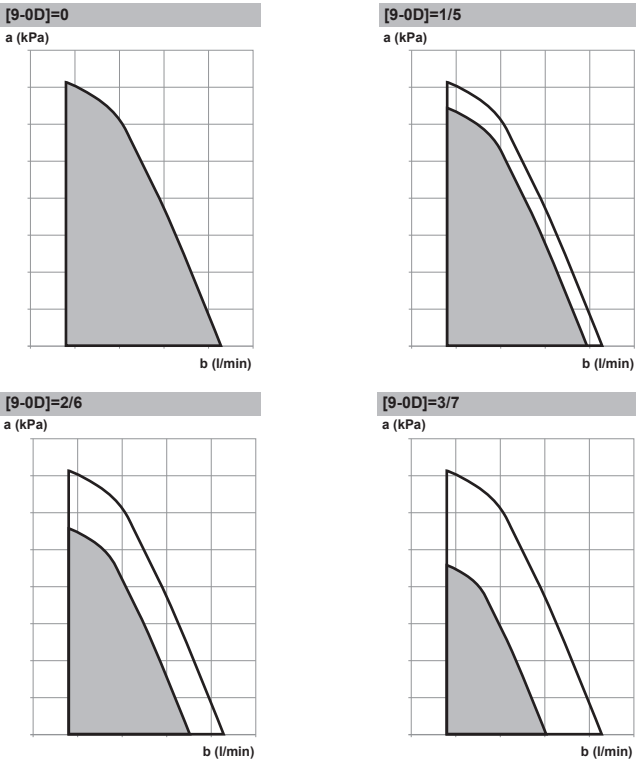
### Pump speed limitation

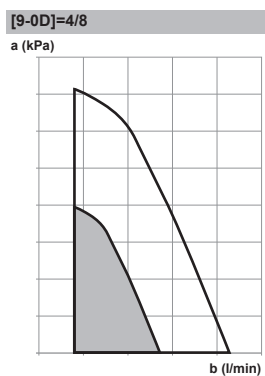
Pump speed limitation [9-0D] defines the maximum pump speed. In normal conditions, the default setting should NOT be modified. The pump speed limitation will be overruled when the flow rate is in the range of the minimum flow (error 7H).

In most cases, instead of using [9-0D], you can prevent flow noises by performing hydraulic balancing.

#	Code	Description
N/A	[9-0D]	<p>Pump speed limitation</p> <ul style="list-style-type: none"><li>0: No limitation.</li><li>1~4: General limitation. There is limitation in all conditions. The required delta T control and comfort are <b>NOT</b> guaranteed.<ul style="list-style-type: none"><li>1: 90% pump speed</li><li>2: 80% pump speed</li><li>3: 70% pump speed</li><li>4: 60% pump speed</li></ul></li><li>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.</li></ul> <p>During sampling operation the pump runs for a short time to measure the water temperatures, which indicate if operation is required or not.</p> <ul style="list-style-type: none"><li>5: 90% pump speed during sampling</li><li>6: 80% pump speed during sampling</li><li>7: 70% pump speed during sampling</li><li>8: 60% pump speed during sampling</li></ul>

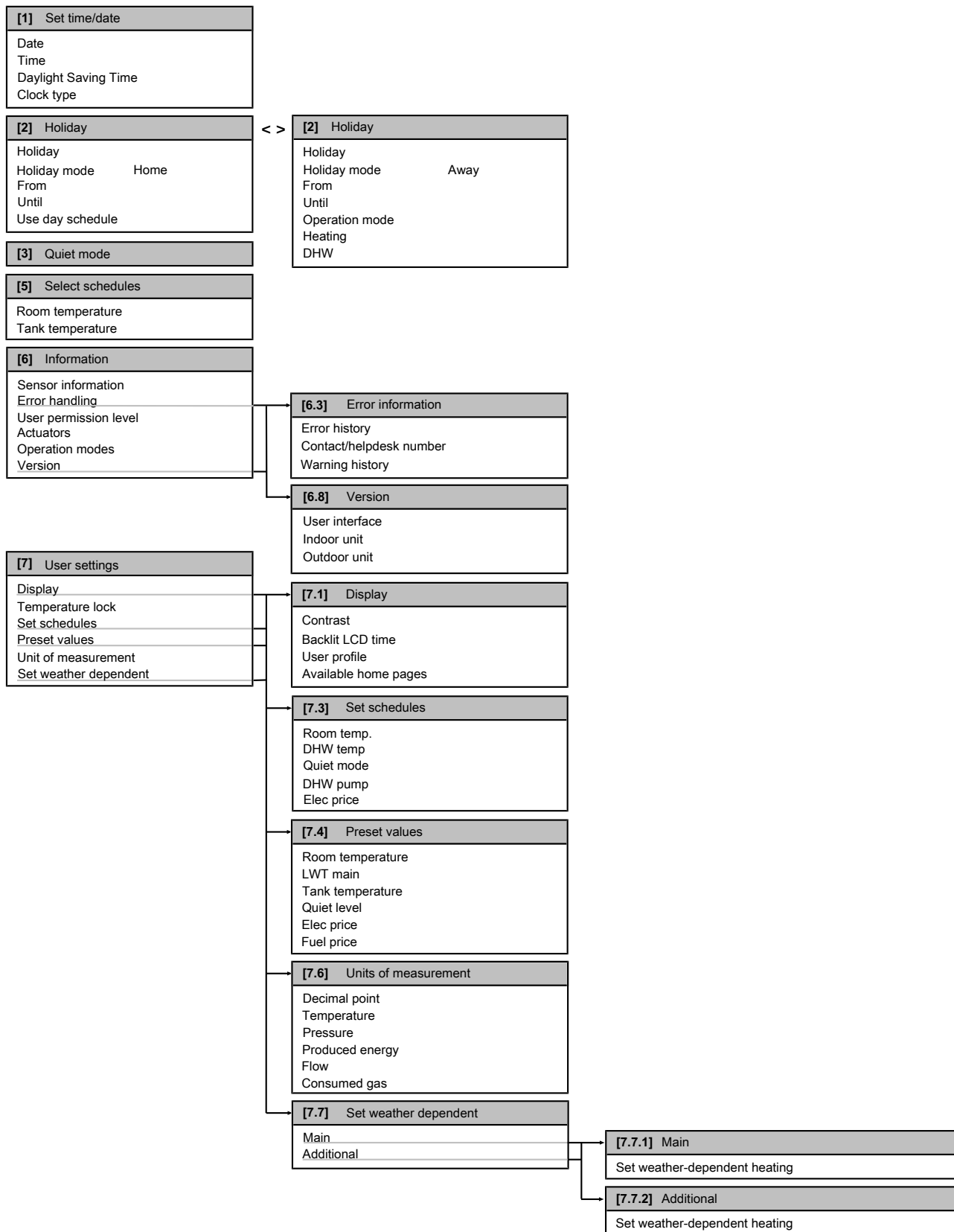
The maximum values depend on the unit type:





- a** External static pressure  
**b** Water flow rate

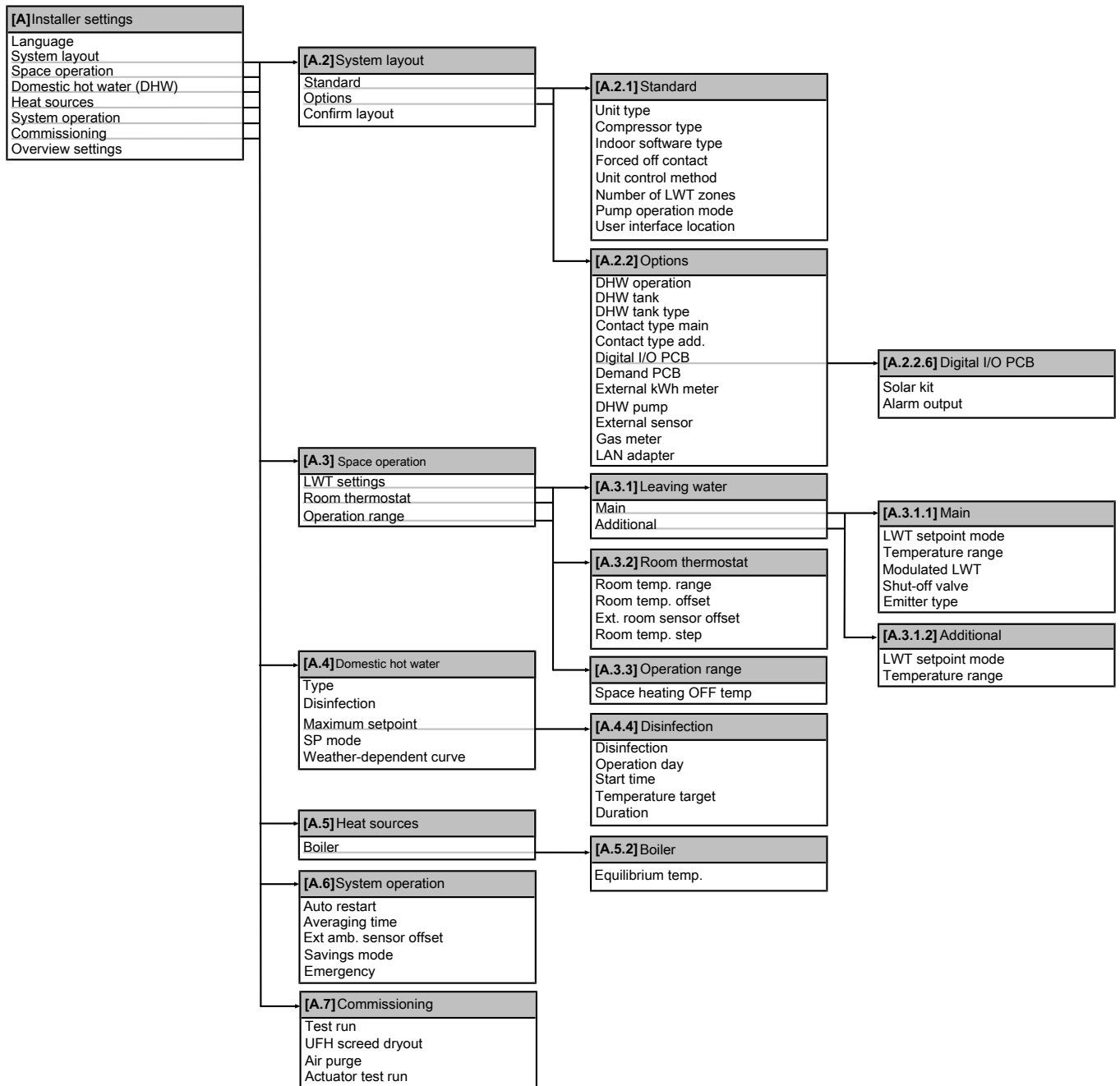
## 10.1.4 Menu structure: Overview user settings



**INFORMATION**

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

## 10.1.5 Menu structure: Overview installer settings

**INFORMATION**

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

**INFORMATION**

Demand PCB settings are shown but are NOT applicable for this unit. Settings shall NOT be used or changed.



### INFORMATION

External kWh meter settings are shown but are NOT applicable for this unit. Settings shall NOT be used or changed.

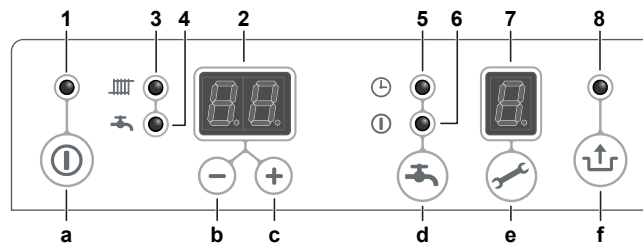


### INFORMATION

Gas meter settings are shown but are NOT applicable for this unit. Settings shall NOT be used or changed.

## 10.2 Gas boiler

### 10.2.1 Overview: Configuration



#### Read out

- 1 On/OFF
- 2 Main display
- 3 Space heating operation
- 4 Domestic hot water operation
- 5 Domestic hot water comfort function eco
- 6 Domestic hot water comfort function on (continuous)
- 7 Service display
- 8 Flashes to indicate a fault

#### Operation

- a On/OFF button
- b One single room
- c - button
- d + button
- e Service button
- f Reset button

### 10.2.2 Basic configuration

#### To turn on/off the gas boiler

- 1 Push the button.

**Result:** The green LED above the button will light up when the boiler is ON.

When the gas boiler is OFF, - is displayed on the service display to indicate that the power is ON. In this mode, the pressure in the space heating installation will also be displayed on the main display (bar).

#### Domestic hot water comfort function

##### Not applicable for Switzerland

This function can be operated with the domestic hot water comfort key (). The following functions are available:


- On: The LED lights up. The domestic hot water comfort function is switched on. The heat exchanger will be kept on temperature to assure instant delivery of hot water.
- Eco: The LED lights up. The domestic hot water comfort function is self-learning. The appliance will learn to adapt to the pattern of use of hot tap water. For example: the temperature of the heat exchanger will NOT be maintained during the night or in case of long absence.
- Off: Both LED's are OFF. The temperature of the heat exchanger is NOT maintained. For example: It will take a while to deliver hot water to the hot water taps. If there is no need for immediate hot water delivery, the domestic hot water comfort function can be turned off.

#### To reset the gas boiler



#### INFORMATION

Resetting is only possible when an error occurs.

**Prerequisite:** Flashing LED above the  button and an error code on the main display.

**Prerequisite:** Check the meaning of the error code (see ["Error codes of the gas boiler"](#) [▶ 201]) and resolve the cause.

- 1 Press  to restart the gas boiler.

### Maximum space heating supply temperature

See the user reference guide of the indoor unit for more details.


### Domestic hot water temperature

See the user reference guide of the indoor unit for more details.

### Keep hot function







This function must be deactivated through the parameter settings of the gas boiler.

### Frost protection function

The boiler is equipped with an internal frost protection function that automatically operates when necessary, even if the boiler is turned off. If the heat exchanger temperature drops too low, the burner will switch on until the temperature is sufficiently high again. When frost protection is active,  is displayed on the service display.

### To set the parameters via the service code



The gas boiler is factory set in accordance with the default settings. Take into account the remarks in the table below when changing the parameters.

- 1 Press simultaneously on  and  until  appears on the main and the service display.
- 2 Use the **+** and **-** buttons to set 15 (service code) on the main display.
- 3 Press the  button to set the parameter on the service display.
- 4 Use the **+** and **-** buttons to set the parameter to the desired value on the service display.
- 5 When all settings are done, press  until  appears on the service display.


**Result:** The gas boiler has now been reprogrammed.



#### INFORMATION

- Press the  button to exit the menu without storing the parameter changes.
- Press the  button to load the default settings of the gas boiler.

### Parameters on the gas boiler

Parameter	Setting	Range	Default settings	Description
	Service code	—	—	To access the installer settings, enter the service code (=15)



Parameter	Setting	Range	Default settings	Description
1	Installation type	0~3	0	<ul style="list-style-type: none"> <li>0=Combi</li> <li>1=Heating only + external domestic hot water tank</li> <li>2=Domestic hot water only (no heating system required)</li> <li>3=Heating only</li> </ul> <p>It is recommended not to modify this setting.</p>
2	Space heating pump continuous	0~3	0	<ul style="list-style-type: none"> <li>0=Post purge period only</li> <li>1=Pump continuously active</li> <li>2=Pump continuously active with MIT switch</li> <li>3=Pump on with external switch</li> </ul> <p>This setting has no effect.</p>
3	Maximum space heating power set	~85%	70%	<p>Maximum power in heating. This is a percentage of the maximum set in parameter 1. It needs to be set according to the expected heat demand of the system.</p> <p>This setting also refers to the maximum load of the boiler for the heat up of the domestic hot water tank.</p>
3.	Maximum capacity space heating pump	—	80	<p>There is no space heating pump in the gas boiler. Changing this setting has no effect.</p>
4	Maximum domestic hot water power set (not applicable for Switzerland)	~100%	100%	<p>Maximum power in instant domestic hot water. This is a percentage of the maximum set in parameter 1. Because of the 2-digit display, the highest displayable value is 99. It is however possible to set this parameter to 100% (default setting). We strongly recommend not modifying this setting.</p>
5	Minimum supply temperature of the heat curve	10°C~25°C	15°C	<p>Do NOT modify this setting on the boiler. Use the user interface instead.</p>
5.	Maximum supply temperature of the heat curve	30°C~90°C	90°C	<p>Do NOT modify this setting on the boiler. Use the user interface instead.</p>

Parameter	Setting	Range	Default settings	Description
6	Minimum outside temperature of the heat curve	−30°C~10°C	−7°C	Do NOT modify this setting on the boiler. Use the user interface instead.
7	Maximum outside temperature of the heat curve	15°C~30°C	25°C	Do NOT modify this setting on the boiler. Use the user interface instead.
8	Space heating pump post purge period	0~15 min	1 min	Changing this setting has no effect on the operation of the unit.
9	Space heating pump post purge period after domestic hot water operation	0~15 min	1 min	Changing this setting has no effect on the operation of the unit.
Я	Position 3-way valve or electric valve	0~3	0	<ul style="list-style-type: none"> <li>0=Powered during space heating</li> <li>1=Powered during domestic hot water</li> <li>2=Powered during every heat demand (space heating, domestic hot water, eco/comfort)</li> <li>3=Zone regulation</li> <li>4 and higher=Not applicable</li> </ul>
ь	Booster	0~1	0	Changing this setting has no effect on the operation of the unit.
Ĉ	Step modulation	0~1	1	<ul style="list-style-type: none"> <li>0=OFF during space heating operation</li> <li>1=ON during space heating operation</li> </ul> <p>It is recommended not to modify this setting.</p>
с	Minimal space heating rpm	23%~50%	23%	<p>Adjustment range 23~50% (40=propane).</p> <p>It is recommended not to modify this setting in case of natural gas.</p> <p>This setting also refers to the minimum load of the boiler for the heat up of the domestic hot water tank.</p>
с.	Minimum capacity space heating pump	—	40	There is no space heating pump in the gas boiler. Changing this setting has no effect.

Parameter	Setting	Range	Default settings	Description
d	Minimal domestic hot water rpm (not applicable for Switzerland)	23%~50%	23%	Adjustment range 23~50% (40=propane). It is recommended not to modify this setting in case of natural gas.
ε	Minimal supply temperature during OT demand. (OpenTherm thermostat)	10°C~16°C	40°C	Changing this setting has no effect on the operation of the unit.
ε.	Reversible setting	0~1	1	This setting activates the keep hot function of the gas boiler. It is only used with reversible heat pump models and should NEVER be deactivated. It MUST be deactivated for heating only models (set to 0). <ul style="list-style-type: none"> <li>0=disabled</li> <li>1=enabled</li> </ul>
F	Start rpm space heating	50%~99%	50%	This is the fan rpm before heating ignition. It is recommended not to modify this setting.
F.	Start rpm domestic hot water (not applicable for Switzerland)	50%~99%	50%	This is the fan rpm before instant domestic hot water ignition. It is recommended not to modify this setting.
h	Maximum fan rpm	45~50	48	Use this parameter to set the maximum fan rpm. It is recommended not to modify this setting.
n	Set point space heating (flow temperature) during heating external domestic hot water tank	60°C~90°C	85°C	Do NOT modify this setting on the boiler. Use the user interface instead.
n.	Comfort temperature	0°C / 40°C~65°C	0°C	Temperature used for eco/comfort function. When the value is 0°C, the eco/comfort temperature is the same as the domestic hot water setpoint. Otherwise, the eco/comfort temperature is between 40°C and 65°C.
Q.	Waiting time after a space heating demand from a thermostat.	0 min~15 min	0 min	Changing this setting has no effect on the operation of the unit.
o	Waiting time after a domestic hot water demand before a space heating demand is answered.	0 min~15 min	0 min	Amount of time the boiler waits before answering a space heating demand after a domestic hot water demand.

Parameter	Setting	Range	Default settings	Description
o.	Number of eco days.	1~10	3	Number of eco days.
P	Anti-cycling period during space heating operation	0 min~15 min	5 min	Minimal switch-off time in space heating operation. It is recommended not to modify this setting.
P.	Reference value for domestic hot water	24-30-36	36	<ul style="list-style-type: none"> <li>24: Not applicable.</li> <li>30: Not applicable.</li> <li>36: Only for EHYKOMB33AA*.</li> </ul>

### Maximum space heating power setting

The maximum space heating power setting (3) is factory set to 70%. If more or less power is required, you can change the fan rpm. The table below shows the relationship between the fan rpm and the appliance power. It is strongly recommended NOT to modify this setting.

Desired power (kW)	Setting on service display (% of max. rpm)
26.2	83
25.3	80
22.0	70
19.0	60
15.9	50
12.7	40
9.6	30
7.0	25

Note that for the gas boiler the power during burning is increased slowly and is reduced as soon as the supply temperature is reached.

### To change to a different type of gas



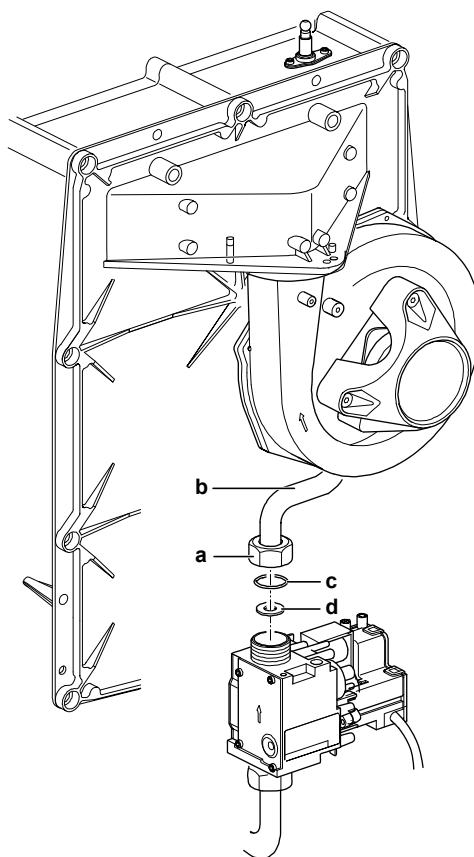
#### CAUTION

Work on gas carrying parts may ONLY be carried out by a qualified competent person. ALWAYS comply with local and national regulations. The gas valve is sealed. In Belgium, any modifications to the gas valve MUST be performed by a certified representative of the manufacturer. For more information, contact your dealer.

If a different type of gas is connected to the appliance than that for which the appliance has been set by the manufacturer, the gas metering MUST be replaced. Conversion sets for other types of gas are available to order. See ["6.2.2 Possible options for the gas boiler"](#) [▶ 35].

- 1 Switch the boiler off and isolate the boiler from the mains power.
- 2 Close the gas tap.
- 3 Remove the front panel from the appliance.
- 4 Unscrew the coupling (a) above the gas valve and twist the gas mixing tube towards the rear (b).

- 5 Replace the O-ring (c) and the gas restriction (d) with the rings from the conversion set.
- 6 Reassemble in reverse sequence.
- 7 Open the gas tap.
- 8 Check the gas connections before the gas valve for gastightness.
- 9 Switch on the mains power.
- 10 Check the gas connections after the gas valve for gastightness (during operation).
- 11 Now check the setting of the CO<sub>2</sub> percentage at high setting (H in display) and low setting (L in display).
- 12 Put a sticker indicating the new gas type on the bottom of the gas boiler, next to the nameplate.
- 13 Put a sticker indicating the new gas type next to the gas valve, over the existing one.
- 14 Put the front panel back in its place.



- a Coupling
- b Gas mixing tube
- c O-ring
- d Gas metering ring



#### INFORMATION

The gas boiler is configured for operation with gas type G20 (20 mbar). However, if the gas type present is G25 (25 mbar), the gas boiler can still be operated without modification.

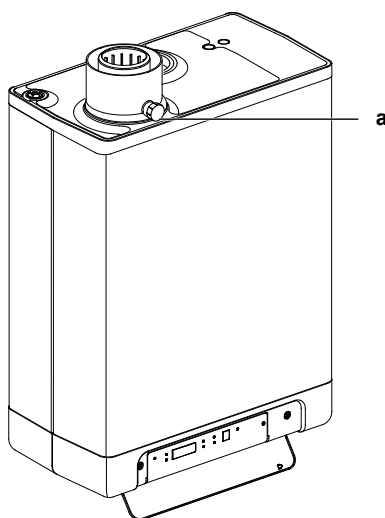
### About the CO<sub>2</sub> setting

The CO<sub>2</sub> setting has been set in the factory and in principle requires no adjustments. The setting can be checked by measuring the CO<sub>2</sub> percentage in the combustion gases. In case of possible disturbance of the adjustment, replacement of the gas valve or conversion to another gas type the adjustment must be checked and if necessary set according to the instructions below.

Always check the CO<sub>2</sub> percentage when the cover is open.

### To check the CO<sub>2</sub> setting

- 1 Switch off the heat pump module with the user interface.
- 2 Switch off the gas boiler with the  $\odot$  button.  $\_$  appears on the service display.
- 3 Remove the front panel from the gas boiler.
- 4 Remove the sampling point (a) and insert a suitable flue gas analyser probe.



#### INFORMATION

Make sure the start-up procedure of the analyser is completed before inserting the probe into the sampling point.



#### INFORMATION

Allow the gas boiler to operate steadily. Connecting the measuring probe before stable operation can give incorrect readings. It is recommended to wait at least 30 minutes.




- 5 Switch on the gas boiler with the  $\odot$  button and create a space heating demand.
- 6 Select High setting by simultaneously pressing  $\swarrow$  and  $+$  twice. Capital H will appear on the service display. The user interface will display **Busy**. Do NOT test when lowercase h is displayed. If this is the case, press  $\swarrow$  and  $+$  again.
- 7 Allow readings to stabilise. Wait for at least 3 minutes and compare the CO<sub>2</sub> percentage with the values in the table below.

CO <sub>2</sub> value at maximum power	Natural gas G20	Natural gas G25	Propane P G31
Maximum value	9.6	8.3	10.8
Minimum value	8.6	7.3	9.8

- 8 Note down the CO<sub>2</sub> percentage at maximum power. This is important with regard to the next steps.


**CAUTION**

It is NOT possible to adjust the CO<sub>2</sub> percentage when test program H is running. When the CO<sub>2</sub> percentage deviates from the values in the table above, please contact your local service department.

- 9 Select Low setting by simultaneously pressing  and  buttons once.  will appear on the service display. The user interface will display **Busy**.
- 10 Allow readings to stabilise. Wait for at least 3 minutes and compare the CO<sub>2</sub> percentage with the values in the table below.

CO <sub>2</sub> value at maximum power	Natural gas G20	Natural gas G25	Propane P G31
Maximum value	(a)		
Minimum value	8.4	7.4	9.4

<sup>(a)</sup> CO<sub>2</sub> value at maximum power recorded at High setting.

- 11 If the CO<sub>2</sub> percentage at maximum and minimum power is within the range expressed in the tables above, the CO<sub>2</sub> setting of the boiler is correct. If NOT, adjust the CO<sub>2</sub> setting according to the instructions in the chapter below.
- 12 Switch off the appliance by pressing the  button and put the sampling point back in its place. Make sure it is gastight.
- 13 Put the front panel back in its place.

**CAUTION**

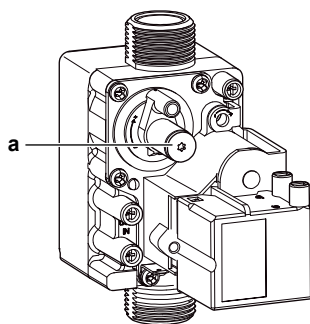
Work on gas carrying parts may ONLY be carried out by a qualified competent person.

### To adjust the CO<sub>2</sub> setting

**INFORMATION**


Only adjust the CO<sub>2</sub> setting when you have checked it first and are sure adjustment is necessary. In Belgium, any modifications to the gas valve MUST be performed by a certified representative of the manufacturer. For more information, contact your dealer.

- 1 Remove the cap that covers the adjustment screw. In the illustration, the cover cap is already removed.
- 2 Turn the screw (a) to increase (clockwise) or decrease (counterclockwise) the CO<sub>2</sub> percentage. See the table below for the desired value.



**a** Adjusting screw with cover

Measured value at maximum power	Adjustment values CO <sub>2</sub> (%) at minimum power (front cover opened)	
	Natural gas 2H/2E (G20, 20 mbar)	Propane 3P (G31, 30/50/37 mbar)
10.8	—	10.5±0.1
10.6		10.3±0.1
10.4		10.1±0.1
10.2		9.9±0.1
10.0		9.8±0.1
9.8		9.6±0.1
9.6	9.0±0.1	—
9.4	8.9±0.1	
9.2	8.8±0.1	
9.0	8.7±0.1	
8.8	8.6±0.1	
8.6	8.5±0.1	

- 3** After measuring the CO<sub>2</sub> percentage and adjusting the setting, put the cover cap and the sampling point back in their place. Make sure they are gastight.
- 4** Select High setting by simultaneously pressing  and **+** twice. Capital H will appear on the service display.
- 5** Measure the CO<sub>2</sub> percentage. If the CO<sub>2</sub> percentage still deviates from the values in the table indicating the CO<sub>2</sub> percentage at maximum power, contact your local dealer.
- 6** Press **+** and **-** simultaneously to exit the test program.
- 7** Put the front panel back in its place.



# 11 Operation

## In this chapter

11.1	Overview: Operation .....	165
11.2	Heating.....	165
11.3	Domestic hot water.....	165
11.3.1	Flow resistance graph for appliance domestic hot water circuit.....	166
11.4	Operation modes.....	166

## 11.1 Overview: Operation

The gas boiler is a modulating, high-efficiency boiler. This means that the power is adjusted in line with the desired heat requirement. The aluminium heat exchanger has 2 separate copper circuits. As a result of the separately constructed circuits for space heating and domestic hot water, the heating and the hot water supply can operate independently, but not simultaneously.

The gas boiler has an electronic boiler controller which does the following when heating or hot water supply is required:

- starting the fan,
- opening the gas valve,
- igniting the burner,
- constantly monitoring and controlling the flame.

It is possible to use the domestic hot water circuit of the gas boiler without connecting and filling the space heating system.

## 11.2 Heating

Heating is controlled by the indoor unit. The boiler will start-up the heating process when there is a request from the indoor unit.



### INFORMATION

For third-party gas boilers, prolonged boiler operation at low outdoor temperatures might be temporarily interrupted to protect the outdoor unit and water piping from freezing. During this temporary interruption the boiler might appear to be off.

## 11.3 Domestic hot water

### Not applicable for Switzerland

Instant domestic hot water is supplied by the boiler. Because supplying domestic hot water has priority over space heating, the boiler will switch to domestic hot water mode whenever there is a hot water demand. When a simultaneous space heating and domestic hot water demand occurs:

- during heat pump only operation (space heating mode), the heat pump will provide heat while the boiler is bypassed and switches to domestic hot water mode to provide domestic hot water.
- during boiler only operation, and with the boiler in domestic hot water mode, space heating will NOT be provided, but domestic hot water will.

- during simultaneous heat pump and boiler operation, the heat pump will provide heat and the boiler will be bypassed and switch to domestic hot water mode to provide domestic hot water.

This manual only explains the domestic hot water making without having a domestic hot water tank combined with the system. For the operation and needed settings of domestic hot water in combination with a domestic hot water tank needed for Switzerland, please see the manual of the heat pump module.

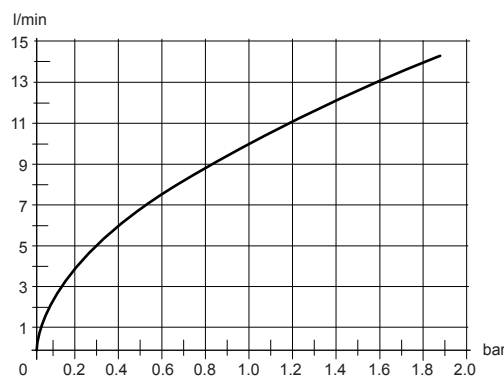


#### INFORMATION

For EHY2KOMB28+32AA, prolonged instant domestic hot water operation at low outdoor temperatures might be temporarily interrupted to protect the outdoor unit and water piping from freezing.

### 11.3.1 Flow resistance graph for appliance domestic hot water circuit

#### Not applicable for Switzerland



The minimum flow for domestic hot water operation is 1.5 l/min. The minimum pressure is 0.1 bar. A low flow (<5 l/min) can reduce comfort. Make sure to set the setpoint high enough.

## 11.4 Operation modes

The following codes on the service display indicate the following operating modes.

#### - Off

The gas boiler is out of operation but is supplied with electric power. There will be no response on space heating and/or domestic hot water demands. Frost protection is active. This means that the exchanger is heated up if the water temperature in the gas boiler is too low. If applicable, the keep hot function will also be active.

If frost protection or keep hot function is activated, 7 will be displayed (heating the exchanger). In this mode, the pressure (bar) in the space heating installation can be read on the main display.

#### Waiting mode (blank service display)

The LED at the  $\odot$  button is lit and possibly also one of the LEDs for the domestic hot water comfort function. The gas boiler is waiting for a space heating and/or domestic hot water demand.

#### ⏏ Pump overrun of space heating

After each space heating operation, the pump continues to run. This function is controlled by the indoor unit.

### 1 Boiler shutdown when the required temperature is reached

The boiler controller can temporarily stop the requested space heating demand. The burner will stop. The shutdown occurs because the requested temperature is reached. When the temperature drops too fast and the anti-cycle time has passed, the shutdown will be cancelled.

### 2 Self-test

The sensors check the boiler controller. During the check-up, the boiler controller does NOT perform any other tasks.

### 3 Ventilation

When the appliance is started, the fan goes to starting speed. When the starting speed is reached, the burner is lit. The code will also be visible when post-ventilation is taking place after the burner has stopped.

### 4 Ignition

When the fan has reached its starting speed, the burner is ignited by means of electric sparks. During ignition the code will be visible on the service display. If the burner does NOT ignite, a new ignition attempt occurs after 15 seconds. If after 4 ignition attempts the burner is NOT yet burning, the boiler will go into fault mode.

### 5 Domestic hot water operation

#### Not applicable for Switzerland

The domestic hot water supply has priority over space heating performed by the gas boiler. If the flow sensor detects a domestic hot water demand of more than 2 l/min, space heating by the gas boiler will be interrupted. After the fan has reached speed code and ignition is done, the boiler controller goes into domestic hot water mode.

During the domestic hot water operation, the fan speed and hence the appliance power are controlled by the gas boiler controller so that the domestic hot water temperature reaches the domestic hot water temperature setting.

The domestic hot water supply temperature must be set on the user interface of the hybrid module. See the user reference guide for more details.

### 7 Domestic hot water comfort function/Frost protection/Keep hot function

#### Not applicable for Switzerland

7 appears on the display when either the domestic hot water comfort function, the frost protection function or the keep hot function is active.

### 9 space heating operation

When a space heating request is received from the indoor module, the fan is started, followed by the ignition, and the space heating operation mode. During the space heating operation, the fan speed and hence the appliance power are controlled by the gas boiler controller so that the space heating water temperature reaches the desired space heating supply temperature. During the space heating operation, the requested space heating supply temperature is indicated on the operating panel.

The space heating supply temperature must be set on the user interface of the hybrid module. See the user reference guide for more details.

# 12 Commissioning



**WARNING**

NEVER allow operation of a boiler if the flue gas pipe is NOT installed correctly. See "7.5.12 About securing the flue system" [▶ 69] and "7.5.13 Placing brackets on the flue gas piping" [▶ 69] for more details.

- Do NOT start up the boiler on a promise that it will be corrected later. Start it up only when the flue gas pipe is installed correctly.
- Check on already installed units if the piping is secured correctly. Adjust if required.



**INFORMATION**

Refer to local regulations (e.g. if an installation of any additional material is necessary).



**INFORMATION**

**Protective functions – "Installer-on-site mode".** The software is equipped with protective functions, such as room antifrost. The unit automatically runs these functions when necessary. (If the user interface home pages are off, the unit will not operate automatically.)

During installation or service this behaviour is undesired. Therefore, the protective functions can be disabled:

- **At first power-on:** The protective functions are disabled by default. After 36 h they will be automatically enabled.
- **Afterwards:** An installer can manually disable the protective functions by setting [4-0E]=1. After his work is done, he can enable the protective functions by setting [4-0E]=0.

## In this chapter

12.1	Overview: Commissioning.....	168
12.2	Precautions when commissioning.....	169
12.3	Checklist before commissioning.....	169
12.4	Checklist during commissioning.....	170
12.4.1	To perform a wiring error check.....	170
12.4.2	To check the minimum flow rate.....	171
12.4.3	Air purge function.....	171
12.4.4	To perform a test run.....	173
12.4.5	To perform an actuator test run.....	174
12.4.6	Underfloor heating screed dryout.....	175
12.4.7	To perform a gas pressure test.....	178
12.4.8	To perform a test run on the gas boiler.....	178

## 12.1 Overview: Commissioning

**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.

## 12.2 Precautions when commissioning



### NOTICE

ALWAYS operate the unit with thermistors and/or pressure sensors/switches. If NOT, burning of the compressor might be the result.



### 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.

## 12.3 Checklist before commissioning

- 1 After the installation of the unit, check the items listed below.
- 2 Close the unit.
- 3 Power up the unit.

<input type="checkbox"/>	You read the complete installation instructions, as described in the <b>installer reference guide</b> .
<input type="checkbox"/>	The <b>indoor unit</b> is properly mounted.
<input type="checkbox"/>	The <b>outdoor unit</b> is properly mounted.
<input type="checkbox"/>	The <b>gas boiler</b> is properly mounted.
<input type="checkbox"/>	The following <b>field wiring</b> has been carried out according to this document and the applicable legislation: <ul style="list-style-type: none"> <li>▪ Between the local supply panel and the outdoor unit</li> <li>▪ Between indoor unit and outdoor unit</li> <li>▪ Between the local supply panel and the indoor unit</li> <li>▪ Between the indoor unit and the valves (if applicable)</li> <li>▪ Between the indoor unit and the room thermostat (if applicable)</li> <li>▪ Between the indoor unit and the domestic hot water tank (if applicable)</li> <li>▪ Between the gas boiler and the local supply panel (only applicable in case of hybrid system)</li> </ul>
<input type="checkbox"/>	The <b>communication cable</b> between the gas boiler and the indoor unit is properly mounted.
<input type="checkbox"/>	The system is properly <b>earthed</b> and the earth terminals are tightened.
<input type="checkbox"/>	The <b>fuses</b> or locally installed protection devices are installed according to this document, and have NOT been bypassed.
<input type="checkbox"/>	The <b>power supply voltage</b> matches the voltage on the identification label of the unit.
<input type="checkbox"/>	There are NO <b>loose connections</b> or damaged electrical components in the switch box.
<input type="checkbox"/>	There are NO <b>damaged components</b> or <b>squeezed pipes</b> on the inside of the indoor and outdoor units.
<input type="checkbox"/>	There are NO <b>refrigerant leaks</b> .
<input type="checkbox"/>	The <b>refrigerant pipes</b> (gas and liquid) are thermally insulated.
<input type="checkbox"/>	The correct pipe size is installed and the <b>pipes</b> are properly insulated.
<input type="checkbox"/>	There is NO <b>water leak</b> inside the indoor unit.

<input type="checkbox"/>	There is NO <b>water leak</b> inside the gas boiler.
<input type="checkbox"/>	There is NO <b>water leak</b> in the connection between the gas boiler and the indoor unit.
<input type="checkbox"/>	The <b>shut-off valves</b> are properly installed and fully open (field supply).
<input type="checkbox"/>	The <b>stop valves</b> (gas and liquid) on the outdoor unit are fully open.
<input type="checkbox"/>	The <b>air purge</b> valve is open (at least 2 turns).
<input type="checkbox"/>	The <b>pressure relief valve</b> (space heating circuit) purges water when opened. Clean water MUST come out.
<input type="checkbox"/>	The <b>gas boiler</b> is switched ON.
<input type="checkbox"/>	Setting E. is correctly set on the gas boiler. The setting must be 0.
<input type="checkbox"/>	The <b>minimum water volume</b> is guaranteed in all conditions. See "To check the water volume and flow rate" in <a href="#">"8.5 Preparing water piping" [▶ 90]</a> .

## 12.4 Checklist during commissioning

The order mentioned in following commissioning checklist MUST be followed.

<input type="checkbox"/>	To perform a <b>wiring</b> check.
<input type="checkbox"/>	To check that the <b>minimum flow rate</b> is guaranteed in all conditions. See "To check the water volume and flow rate" in <a href="#">"8.5 Preparing water piping" [▶ 90]</a> .
<input type="checkbox"/>	To perform an <b>air purge</b> .
<input type="checkbox"/>	To perform a <b>test run when the hybrid is in heating mode</b> .
<input type="checkbox"/>	To perform an <b>actuator test run</b> .
<input type="checkbox"/>	To perform (start) an <b>underfloor screed dryout</b> (if necessary).
<input type="checkbox"/>	To perform a gas pressure test.
<input type="checkbox"/>	To perform a test run on the <b>gas boiler</b> .
<input type="checkbox"/>	To perform a test run on the <b>airconditioning DX unit in cooling mode</b> .

### 12.4.1 To perform a wiring error check



#### INFORMATION

- You only have to perform a wiring error check if you are not sure that the electrical wiring and piping is connected correctly.
- If you perform a wiring error check, the hybrid for multi indoor unit will not operate by heat pump for 72 hours. During this time, the gas boiler will take over the hybrid operation.

**Prerequisite:** Indoor and outdoor unit must be installed and connected.

**Prerequisite:** Make sure that the water temperature in the system is >25°C.

- Heat up the water temperature in the system >25°C.



#### NOTICE

If the water temperature in the system is ≤25°C, the plate heat exchanger will freeze and damage occurs.

- 2 Proceed with the steps as described in the outdoor unit installation manual or outdoor unit installer reference guide to perform a wiring error check.

**NOTICE**

Make sure that the minimum required water flow in the unit is guaranteed.

### 12.4.2 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 "12.4.5 To perform an actuator test run" [▶ 174]).
- 4 Go to [6.1.8]: > **Information** > **Sensor information** > **Flow rate** to check the flow rate. During pump test run operation, the unit can operate below this minimum required flow rate.

Bypass valve foreseen?	
Yes	No
Modify the bypass valve setting to reach the minimum required flow rate + 2 l/min	In case the actual flow rate is below the minimum flow rate, modifications at the hydraulic configuration are required. Increase the space heating loops that can NOT be closed or install a pressure-controlled bypass valve.
Minimum required flow rate	
05+08 models	9 l/min

### 12.4.3 Air purge function

#### Purpose

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

**NOTICE**

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

#### Manual or automatic

There are 2 modes for purging air:

- Manually: the unit will operate with a fixed pump speed (high or low), which can be set. The position of the 3-way valve for the optional domestic hot water tank as well as that of the gas boiler's bypass valve can also be set. To ensure all air will be removed, however, it is recommended NOT to adjust their custom position.

- Automatic: the pump alternates between high speed, low speed and standstill position. The position of the 3-way valve automatically alternates between that for space heating and that for domestic hot water heating. The gas boiler is continuously bypassed. To remove air from the gas boiler, perform a manual air purge on the gas boiler.

### Typical workflow

Purging the air from the system should consist of:

- 1 Performing a manual air purge
- 2 Performing an automatic air purge



#### INFORMATION

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

### Air purge prerequisites

- 3 Install air purges on each part of the installation where the pipe work goes down. (For example on a tank with connections on top.)
- 4 Fill the circuit to  $\pm 2$  bar.
- 5 Purge all radiators and all other air purges installed on the circuit.
- 6 Repeat steps 2 and 3 until purging the radiators and the other points does NOT longer lead to a pressure drop.
- 7 Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

When an air bubble blocks the pump and there is no flow, a 7H error can occur. In this case, stop the air purge function and restart the operation. This will cause the bubble to leave the pump. Make sure the pressure in the circuit is  $\pm 2$  bar and refill if necessary.

To check if the air purge function is finished, monitor the flow rate. If it stays constant when the pump is running at high or low speed, the unit is properly purged. To monitor the flow rate, go to [6.1.8].

The air purge function automatically stops after 42 minutes.





#### INFORMATION

For best results, air purge each loop separately.

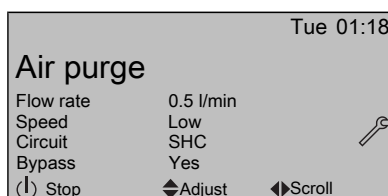
### To perform a manual air purge

**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"](#) [▶ 118].
- 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.
- 9 Set the desired position of the bypass valve. Use the ◀ and ▶ buttons to scroll to **Bypass**.
- 10 Use the ▲ and ▼ buttons to set the desired position of the bypass valve.

**Result: No** (boiler not bypassed)

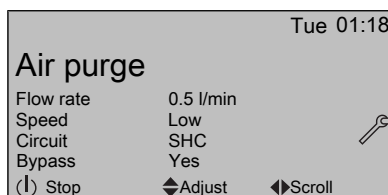
**Result: Yes** (boiler bypassed)

#### 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"](#) [▶ 118].
- 2 Set the air purge mode: go to [A.7.3.1] > **Installer settings** > **Commissioning** > **Air purge** > **Type**.
- 3 Select **Automatic** and press **OK**.
- 4 Go to [A.7.3.4] > **Installer settings** > **Commissioning** > **Air purge** > **Start air purge** and press **OK** to start the air purge function.

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



#### To interrupt air purge

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

#### 12.4.4 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"](#) [▶ 118].
- 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 ( $\pm 30$  min). To stop it manually, press **⏻**, select OK and press **OK**.



#### INFORMATION

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

- The user interface used to start the test run displays a status screen.
- The other user interface displays a "busy" screen. You cannot 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 mode) and tank temperature (domestic hot water mode).

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

During a heating test run, the unit will start up in hybrid operation. The setpoint of the gas boiler during a heating test run is 40°C. Keep in mind the 5°C overshoot that is possible during boiler operation, especially in combination with floor heating loops.

### 12.4.5 To perform an actuator test run

Perform an actuator test run to confirm the operation of the different actuators. For example, when you select **Pump**, a test run of the pump will start.

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"](#) [▶ 118].
- 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

- Pump test



#### INFORMATION

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

- Solar pump test
- Shut-off valve test
- 3-way valve test

- Alarm output test
- Heating signal test
- Quick heat-up test
- DHW pump test
- Gas boiler test
- Bypass valve test

**INFORMATION**

The setpoint during a boiler test run is 40°C. Keep in mind the 5°C overshoot that is possible during boiler operation, especially in combination with floor heating loops.

#### 12.4.6 Underfloor heating screed dryout

The underfloor heating (UFH) screed dryout function is used for drying out the screed of an underfloor heating system during the construction of the building.

This function can be executed without finishing the outdoor installation. In this case, the gas boiler will perform the screed dryout and supply the leaving water without heat pump operation.

When no outdoor unit is installed yet, then connect the main power supply cable to the indoor unit via X2M/30 and X2M/31. See ["9.2.2 To connect the main power supply of the indoor unit"](#) [▶ 108].

**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 maximum allowed water temperature, to avoid cracking the screed,
- programming the underfloor heating screed dryout schedule according to the initial heating instructions of the screed manufacturer,
- checking the proper functioning of the setup on a regular basis,
- performing the correct program complying with the type of the used screed.

**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 "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.

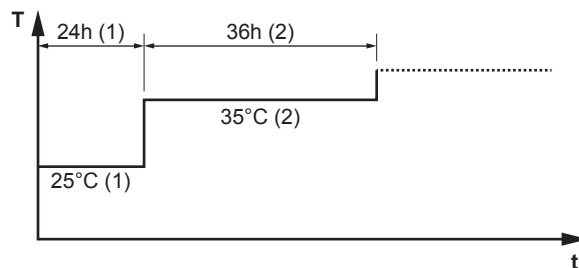
**NOTICE**

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, up to 55°C.

**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"](#) [▶ 118].
- 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 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**

**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 .
- 4 Select **OK** and press .


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



#### INFORMATION

In case no outdoor unit is installed, the user interface will ask if the gas boiler can take over the entire load. After allowing this, restart the screed dryout program to make sure all actuators are operating.

#### 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 "[15.4 Solving problems based on error codes](#)" [▶ 197]. 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 .

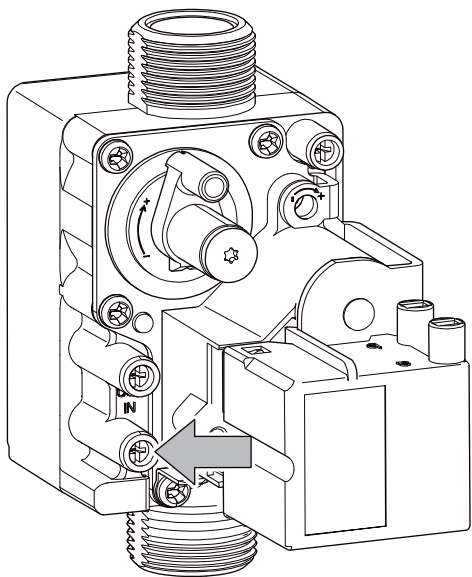
**Result:** The underfloor heating screed dryout program is stopped.

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.

12.4.7 To perform a gas pressure test

- 1 Connect a suitable gauge on the gas valve. Static pressure MUST be 20 mbar.



- 2 Select test program "H". See "12.4.8 To perform a test run on the gas boiler" [▶ 178]. Static pressure MUST be 20 mbar (+ or – 1 mbar). If the working pressure is <19 mbar, the gas boiler output will be reduced and the correct combustion reading may NOT be obtained. Do NOT adjust the air and/or gas ratio. To obtain sufficient working pressure, gas supply MUST be correct.

**INFORMATION**

Make sure the working inlet pressure does NOT interfere with other gas appliances installed.

12.4.8 To perform a test run on the gas boiler

The gas boiler has a test run function. Activating this function results in the activation of the indoor unit pump, as well as the gas boiler (with a fixed fan speed), without the control functions being actuated. The safety functions remain active. The test run can be stopped by pressing + and – simultaneously or will end automatically after 10 minutes. To perform a test run, switch off the system with the user interface.

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

There may be no error on the gas boiler or the heat pump module. During a gas boiler test run, "busy" will be displayed on the user interface.

Program	Button combination	Display
Burner ON at minimum power	and –	l
Burner ON, maximum space heating power setting	and + (1×)	h
Burner ON, maximum domestic hot water setting	and + (2×)	H
Stop test program	+ and –	Actual situation

**NOTICE**

If an 81-04 error occurs, then do NOT perform a test run on the gas boiler.

**NOTICE**

During the maintenance of the boiler, the direct expansion indoor unit is NOT allowed to operate.

## 13 Hand-over to the user

Once the test run is finished and the unit operates properly, 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/she can find the complete documentation at the URL mentioned earlier in this manual.
- Explain to the user how to properly operate the system and what to do in case of problems.
- Show the user what to do for the maintenance of the unit.
- Explain about energy saving tips to the user as described in the operation manual.



# 14 Maintenance and service



## NOTICE

Maintenance **MUST** be done by an authorised installer or service agent.

We recommend performing maintenance at least once a year. However, applicable legislation might require shorter maintenance intervals.



## NOTICE

Applicable legislation on **fluorinated greenhouse gases** requires that the refrigerant charge of the unit is indicated both in weight and CO<sub>2</sub> equivalent.

**Formula to calculate the quantity in CO<sub>2</sub> equivalent tonnes:** GWP value of the refrigerant × total refrigerant charge [in kg] / 1000

## In this chapter

14.1	Maintenance safety precautions.....	181
14.1.1	Opening the indoor unit .....	181
14.2	Checklist for yearly maintenance of the indoor unit .....	181
14.3	To disassemble the gas boiler .....	183
14.4	To clean the inside of the gas boiler .....	186
14.5	To assemble the gas boiler.....	186

## 14.1 Maintenance safety precautions



### DANGER: RISK OF ELECTROCUTION



### DANGER: RISK OF BURNING/SCALDING



### 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.

### 14.1.1 Opening the indoor unit

See "7.2.2 To open the switch box cover of the indoor unit" [▶ 49].

## 14.2 Checklist for yearly maintenance of the indoor unit

Check the following at least once a year:

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

### Water pressure

Keep water pressure above 1 bar. If it is lower, add water.

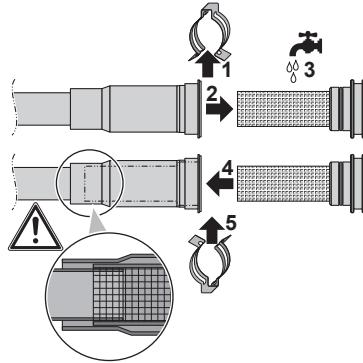
### Water filter

Clean the water filter.



#### NOTICE

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



### Water pressure relief valve

Open the valve and check if it operates correctly. **The water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does NOT contain dirt anymore
  - flush the system and install an additional water filter (a magnetic cyclone filter is preferable).

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

### Pressure relief valve of the domestic hot water tank (field supply)

Open the valve.



#### CAUTION

Water coming out of the valve may be very hot.

- Check if nothing blocks the water in the valve or in between piping. The water flow coming from the relief valve must be high enough.
- Check if the water coming out of the relief valve is clean. If it contains debris or dirt:
  - Open the valve until the discharged water does not contain debris or 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.



#### INFORMATION

It is recommended to perform this maintenance more than once a year.

**Switch box**

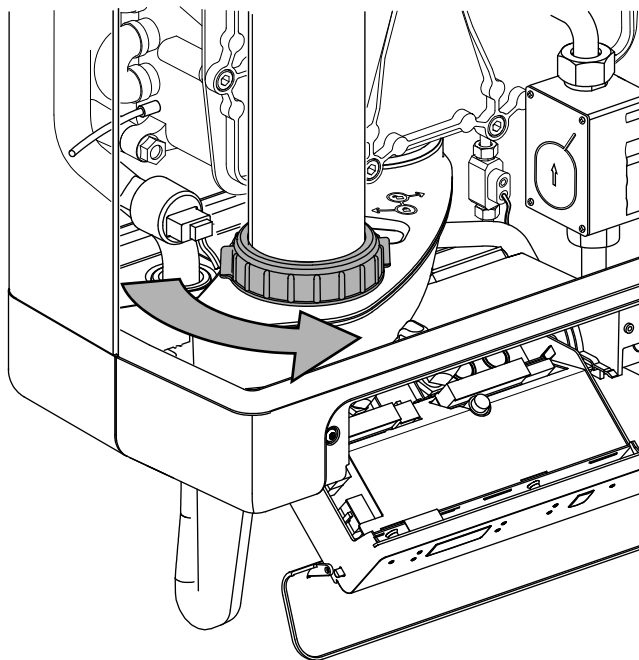
Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.

**WARNING**

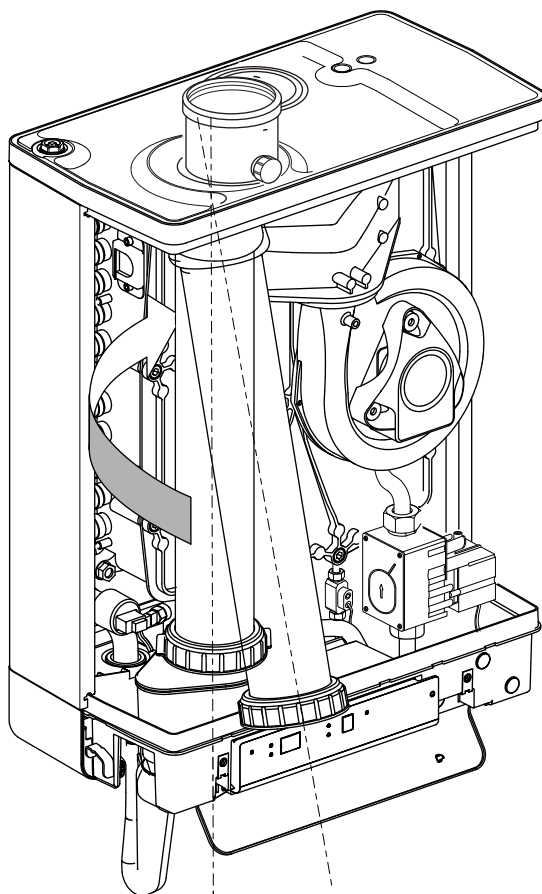
If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

### 14.3 To disassemble the gas boiler

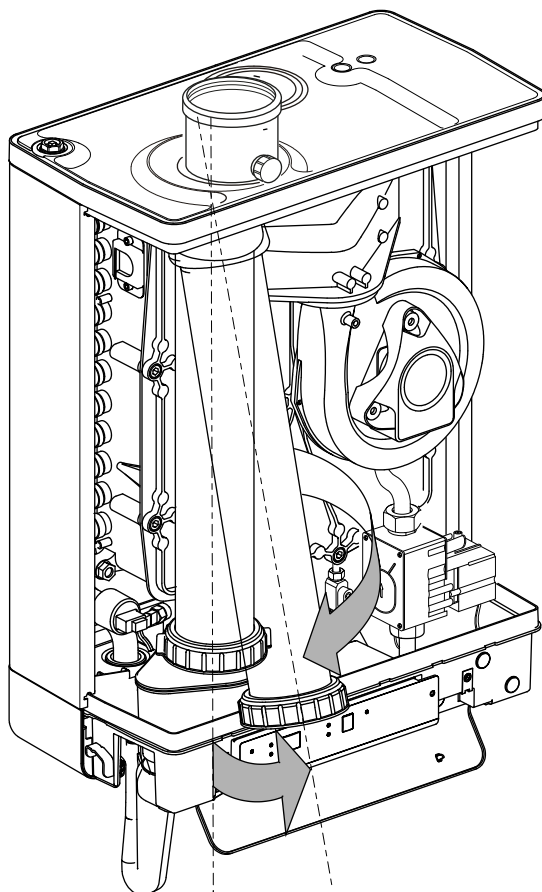
- 1 Turn off the appliance.
- 2 Turn off the main power supply of the appliance.
- 3 Close the gas tap.
- 4 Remove the front panel.
- 5 Wait until the appliance has cooled down.
- 6 Unscrew the coupling nut at the base of the flue pipe by turning counterclockwise.



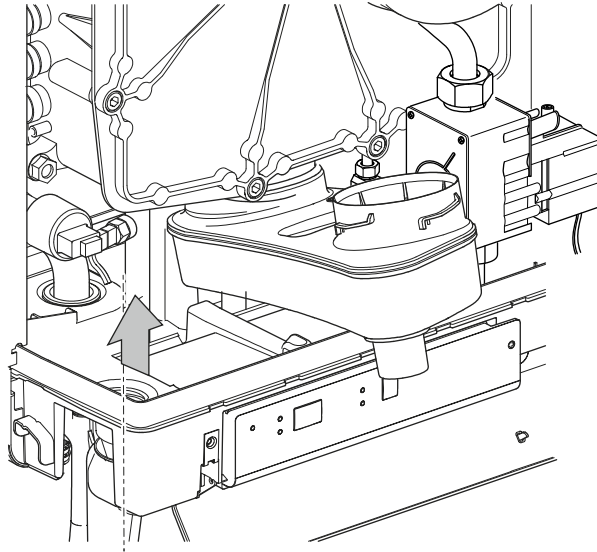
- 7 Slide the flue pipe upwards by turning it clockwise until the bottom of the pipe is above the condensate drain pan connection.



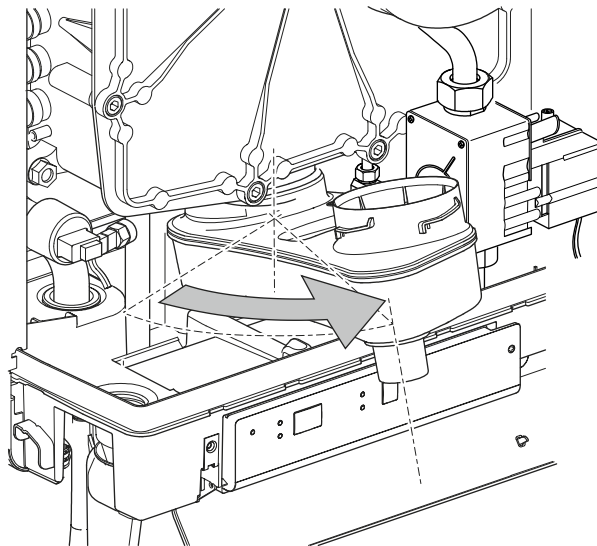
- 8 Pull the bottom of the pipe forwards and remove the pipe downwards by turning the pipe alternately clockwise and counterclockwise.



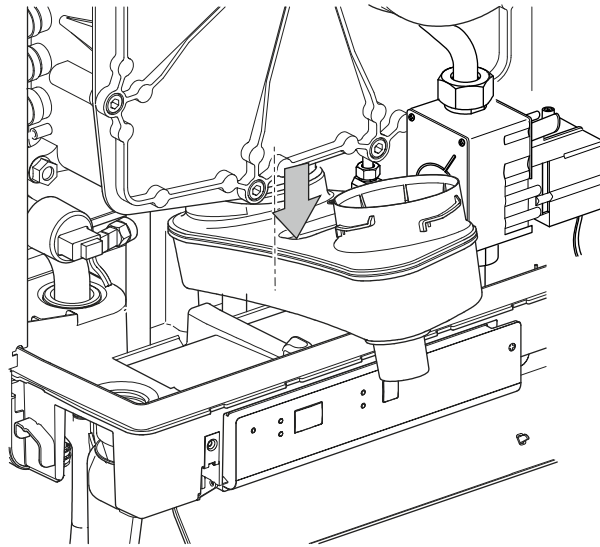
- 9** Lift the condensate drain pan on the left-hand side from the connection to the condensate trap.



- 10** Turn it to the right with the condensate trap connection over the edge of the base tray.



- 11** Push the backside of the condensate drain pan downwards from the connection to the heat exchanger and remove it.



- 12** Remove the connector from the fan and the ignition unit from the gas valve.
- 13** Unscrew the coupling below the gas valve.
- 14** Unscrew the socket head screws from the front cover and remove the socket complete with gas valve and fan to the front.

**NOTICE**

Make sure that the burner, insulation plate, gas valve, gas supply and fan do NOT get damaged.

## 14.4 To clean the inside of the gas boiler

- 1** Clean the heat exchanger from top to bottom with a plastic brush or compressed air.
- 2** Clean the underside of the heat exchanger.
- 3** Clean the condensate drain pan with water.
- 4** Clean the condensate trap with water.

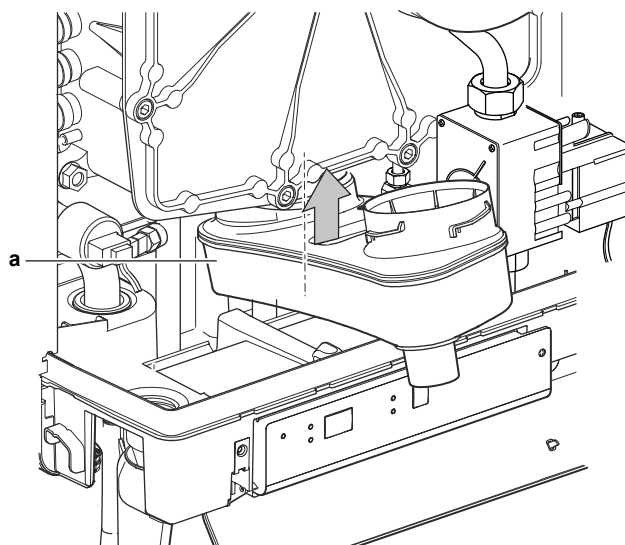
## 14.5 To assemble the gas boiler

**CAUTION**

- During maintenance, the front plate seal **MUST** be replaced.
- When assembling, check the other seals for damage, such as hardening, (hairline) fracture and discoloration.
- If necessary, place a new seal and check the correct positioning.
- If retarders are NOT or incorrectly fitted, it may lead to serious damage.

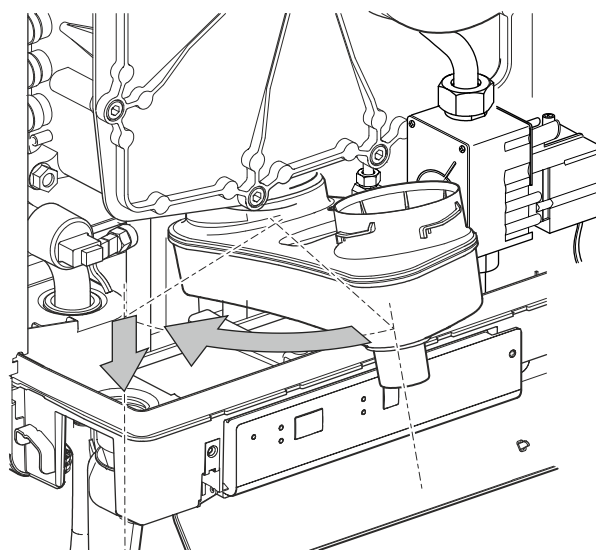
- 1** Check the correct position of the seal around the front cover.
- 2** Place the front cover on the heat exchanger and secure by using the socket head screws plus serrated lock washers.
- 3** Tighten the socket head screws equally hand-tight by turning the hex key clockwise.
- 4** Fit the gas connection below the gas valve.


- 5 Fit the connector to the fan and the ignition unit to the gas valve.
- 6 Fit the condensate drain by sliding on the exchanger outlet stump with the condensate trap connection still in front of the base tray.



a Base tray

- 7 Turn the condensate drain to the left and push it downwards into the condensate trap connection. Make sure in doing this that the back of the condensate drain pan comes to rest on the lug of the back of the base tray.



- 8 Fill the condensate trap with water and fit it to the connection below the condensate drain pan.
- 9 Slide the flue pipe, turning it counterclockwise, with the top around the flue adapter into the top cover.
- 10 Insert the bottom into the condensate drain pan and tighten the coupling nut clockwise.
- 11 Open the gas tap and check the gas connections below the gas valve and on the mounting bracket for leakage.
- 12 Check the space heating and the water pipes for leakages.
- 13 Turn on the main power supply.
- 14 Turn on the appliance by pushing the  button.

- 15** Check the front cover, the fan connection on the front cover and the flue pipe components for leakage.
- 16** Check the gas/air adjustment.
- 17** Fit the casing, tighten the 2 screws on the left and right side of the display.
- 18** Close the display cover.
- 19** Check the heating and hot water supply.



# 15 Troubleshooting

If a malfunction occurs, ⓘ is displayed on the home pages. You can press ⓘ to display more information about the malfunction.

For the symptoms listed below, you can try to solve the problem yourself. For any other problem, contact your installer. You can find the contact/helpdesk number via the user interface.

## In this chapter

15.1	Overview: Troubleshooting .....	189
15.2	Precautions when troubleshooting.....	189
15.3	Solving problems based on symptoms.....	190
15.3.1	Symptom: The unit is NOT heating or cooling as expected .....	190
15.3.2	Symptom: The compressor does NOT start (space heating) .....	191
15.3.3	Symptom: The system is making gurgling noises after commissioning.....	191
15.3.4	Symptom: The pump is making noise (cavitation) .....	192
15.3.5	Symptom: The pressure relief valve opens .....	192
15.3.6	Symptom: The water pressure relief valve leaks.....	192
15.3.7	Symptom: The space is NOT sufficiently heated at low outdoor temperatures .....	193
15.3.8	Symptom: The pressure at the tapping point is temporarily unusually high .....	193
15.3.9	Symptom: Tank disinfection function is NOT completed correctly (AH-error) .....	193
15.3.10	Symptom: Boiler abnormality detection (HJ-11 error) .....	194
15.3.11	Symptom: Boiler/hydrobox combination abnormality (UA-52 error) .....	194
15.3.12	Symptom: The burner does NOT ignite.....	194
15.3.13	Symptom: The burner ignites noisily .....	195
15.3.14	Symptom: The burner resonates.....	195
15.3.15	Symptom: No space heating by the gas boiler.....	195
15.3.16	Symptom: The power is reduced .....	196
15.3.17	Symptom: Space heating does NOT reach the temperature.....	196
15.3.18	Symptom: Hot water does NOT reach the temperature (no tank installed).....	196
15.3.19	Symptom: Hot water does NOT reach the temperature (tank installed) .....	197
15.4	Solving problems based on error codes.....	197
15.4.1	Error codes: Overview.....	197

## 15.1 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.

## 15.2 Precautions when troubleshooting



**DANGER: RISK OF ELECTROCUTION**



**DANGER: RISK OF BURNING/SCALDING**

**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 shunt 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.

**WARNING**

Prevent hazards due to inadvertent resetting of the thermal cut-out: power to 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.

## 15.3 Solving problems based on symptoms

### 15.3.1 Symptom: The unit is NOT heating or cooling as expected

Possible causes	Corrective action
The temperature setting is NOT correct	Check the temperature setting on the remote controller. Refer to the operation manual.
The water flow is too low	<p>Check and make sure that:</p> <ul style="list-style-type: none"> <li>▪ All shut-off valves of the water circuit are completely open.</li> <li>▪ The water filter is clean. Clean if necessary.</li> <li>▪ There is no air in the system. Purge air if necessary. You can purge air manually (see <a href="#">"To perform a manual air purge"</a> [▶ 172]) or use the automatic air purge function (see <a href="#">"To perform an automatic air purge"</a> [▶ 173]).</li> <li>▪ The water pressure is &gt;1 bar.</li> <li>▪ The expansion vessel is NOT broken.</li> <li>▪ The resistance in the water circuit is NOT too high for the pump (see the ESP curve in the "Technical data" chapter).</li> </ul> <p>If the problem persists after you have conducted all of the above checks, contact your dealer. In some cases, it is normal that the unit decides to use a low water flow.</p>
The water volume in the installation is too low	Make sure that the water volume in the installation is above the minimum required value (see <a href="#">"8.5.3 To check the water volume and flow rate"</a> [▶ 94]).

## 15.3.2 Symptom: The compressor does NOT start (space heating)

Possible causes	Corrective action
The unit must start up out of its operation range (the water temperature is too low)	<p>If the water temperature is too low, the unit uses the gas boiler to reach the minimum water temperature first (15°C).</p> <p>Check and make sure that:</p> <ul style="list-style-type: none"> <li>▪ The power supply to the gas boiler is correctly wired.</li> <li>▪ The communication cable between the gas boiler and the indoor unit is properly mounted.</li> </ul> <p>If the problem persists after you have conducted all of the above checks, contact your dealer.</p>

## 15.3.3 Symptom: The system is making gurgling noises after commissioning

Possible cause	Corrective action
There is air in the system.	Purge air from the system. <sup>(a)</sup>
Incorrect hydraulic balance.	<p>To be performed by the installer:</p> <ol style="list-style-type: none"> <li>1 Perform hydraulic balancing to assure that the flow is correctly distributed between the emitters.</li> <li>2 If hydraulic balancing is not sufficient, change the pump limitation settings ([9-0D] and [9-0E] if applicable).</li> </ol>
Various malfunctions.	Check if ⓘ is displayed on the home pages of the user interface. You can press ⓘ to display more information about the malfunction.

<sup>(a)</sup> We recommend to purge air with the air purge function of the unit (to be performed by the installer). If you purge air from the heat emitters or collectors, mind the following:

**WARNING**

**Air purging heat emitters or collectors.** Before you purge air from heat emitters or collectors, check if an error or ⓘ is displayed on the home pages of the user interface.

- If not, you can purge air immediately.
- If yes, make sure that the room where you want to purge air is sufficiently ventilated. **Reason:** Refrigerant might leak into the water circuit, and subsequently into the room when you purge air from the heat emitters or collectors.

## 15.3.4 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see <a href="#">"To perform a manual air purge"</a> [▶ 172]) or use the automatic air purge function (see <a href="#">"To perform an automatic air purge"</a> [▶ 173]).
The water pressure at the pump inlet is too low	Check and make sure that: <ul style="list-style-type: none"> <li>▪ The water pressure is &gt;1 bar.</li> <li>▪ The pressure sensor of the gas boiler is not broken.</li> <li>▪ The expansion vessel is NOT broken.</li> <li>▪ The pre-pressure setting of the expansion vessel is correct (see <a href="#">"8.5.4 Changing the pre-pressure of the expansion vessel"</a> [▶ 96]).</li> </ul>

## 15.3.5 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 <a href="#">"8.5.3 To check the water volume and flow rate"</a> [▶ 94] and <a href="#">"8.5.4 Changing the pre-pressure of the expansion vessel"</a> [▶ 96]).
The water circuit head is too high	The water circuit head is the difference in height between the indoor unit and the highest point of the water circuit. If the indoor unit is located at the highest point of the installation, the installation height is considered 0 m. The maximum water circuit head is 7 m.  Check the installation requirements.

## 15.3.6 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: <ul style="list-style-type: none"> <li>▪ If you do NOT hear a clacking sound, contact your dealer.</li> <li>▪ 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.</li> </ul>

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



Possible causes	Corrective action
Gas boiler operation is not activated	Check and make sure that: <ul style="list-style-type: none"> <li>▪ The gas boiler is switched On and is NOT in standby mode.</li> <li>▪ The communication cable between the gas boiler and the indoor unit is properly mounted.</li> <li>▪ There is no error code on the gas boiler display.</li> </ul>
The gas boiler equilibrium temperature has not been configured correctly	Increase the "equilibrium temperature" to activate gas boiler operation at a higher outdoor temperature. Go to: <ul style="list-style-type: none"> <li>▪ [A.5.2.2] &gt; <b>Installer settings</b> &gt; <b>Heat sources</b> &gt; <b>Boiler</b> &gt; <b>Equilibrium temp.</b> OR</li> <li>▪ [A.8] &gt; <b>Installer settings</b> &gt; <b>Overview settings</b> [5-01]</li> </ul>
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: <ul style="list-style-type: none"> <li>▪ Make sure that the "space heating priority status" has been enabled. Go to [A.8] &gt; <b>Installer settings</b> &gt; <b>Overview settings</b> [5-02]</li> <li>▪ Increase the "space heating priority temperature" to activate backup heater operation at a higher outdoor temperature. Go to [A.8] &gt; <b>Installer settings</b> &gt; <b>Overview settings</b> [5-03]</li> </ul>

## 15.3.8 Symptom: The pressure at the tapping point is temporarily unusually high

Possible causes	Corrective action
Failing or blocked pressure relief valve.	<ul style="list-style-type: none"> <li>▪ Flush and clean the complete tank including the piping between pressure relief valve and the cold water inlet.</li> <li>▪ Replace the pressure relief valve.</li> </ul>

## 15.3.9 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	<p>When the <b>Domestic hot water &gt; Type &gt; Reheat</b> or <b>Reheat + sched.</b> 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 via the installer settings (disinfection function).</p> <p>When the <b>Domestic hot water &gt; Type &gt; Scheduled only</b> is selected, it is recommended to program a <b>Storage eco</b> 3 hours before the scheduled start-up of the disinfection function to preheat the tank.</p>
The disinfection operation was stopped manually: with the user interface displaying the DHW home page and its user permission level set to <b>Installer</b> , the  button was pressed during disinfection operation.	Do NOT press the  button while the disinfection function is active.

## 15.3.10 Symptom: Boiler abnormality detection (HJ-11 error)

Possible causes	Corrective action
Communication cable problem	Mount the communication cable between the gas boiler and the indoor unit properly.
Boiler error	Check the boiler display for error information.

## 15.3.11 Symptom: Boiler/hydrobox combination abnormality (UA-52 error)

Possible causes	Corrective action
Boiler/hydrobox mismatch	Make sure that the E. setting is set to 0.
Incompatibility of software	Update the boiler and hydrobox software to the latest version.

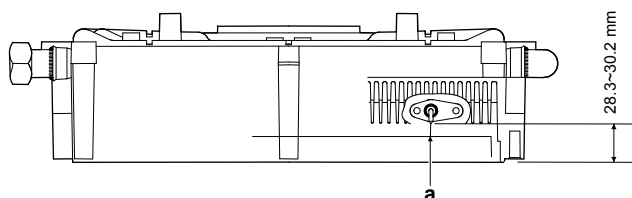
## 15.3.12 Symptom: The burner does NOT ignite

Possible causes	Corrective action
Gas tap is closed.	Open the gas tap.
Air in the gas tap.	Remove air from the gas pipe.
Gas supply pressure too low.	Contact the gas supply company.
No ignition.	Replace the ignition electrode.
No spark. Ignition unit on gas valve faulty.	<ul style="list-style-type: none"> <li>Check the cabling.</li> <li>Check the spark plug cap.</li> <li>Replace the ignition unit.</li> </ul>

Possible causes	Corrective action
Gas/air adjustment NOT correctly set.	Check the adjustment. See <a href="#">"To check the CO<sub>2</sub> setting"</a> [▶ 162].
Fan faulty.	<ul style="list-style-type: none"> <li>Check the wiring.</li> <li>Check the fuse. If necessary, replace the fan.</li> </ul>
Fan dirty.	Clean the fan.
Gas valve faulty.	<ul style="list-style-type: none"> <li>Replace the gas valve.</li> <li>Re-adjust the gas valve, see <a href="#">"To check the CO<sub>2</sub> setting"</a> [▶ 162].</li> </ul>

### 15.3.13 Symptom: The burner ignites noisily

Possible causes	Corrective action
Gas supply pressure too high.	The house pressure switch may be faulty. Contact the gas company.
Incorrect ignition gap.	<ul style="list-style-type: none"> <li>Replace the ignition pin.</li> <li>Check the ignition electrode gap.</li> </ul>
Gas/air adjustment NOT correctly set.	Check the setting. See <a href="#">"To check the CO<sub>2</sub> setting"</a> [▶ 162].
Weak spark.	Check the ignition gap. Replace the ignition electrode. Replace the ignition unit on the gas valve.



a Spark gap ( $\pm 4.5$  mm)

### 15.3.14 Symptom: The burner resonates

Possible causes	Corrective action
Gas supply pressure too low.	The house pressure switch may be faulty. Contact the gas company.
Recirculation of combustion gasses.	Check the flue gas and the air supply.
Gas/air adjustment NOT correctly set.	Check the adjustment. See <a href="#">"To check the CO<sub>2</sub> setting"</a> [▶ 162].

### 15.3.15 Symptom: No space heating by the gas boiler

Possible causes	Corrective action
Heat pump error	Check the user interface.
Communication problem with the heat pump.	Make sure the communication cable is properly installed.

Possible causes	Corrective action
Incorrect heat pump settings.	Check the settings in the heat pump manual.
The service display displays "-", the gas boiler is switched off.	Switch on the gas boiler with ⓪.
No current (24 V)	<ul style="list-style-type: none"> <li>Check the wiring.</li> <li>Check the connector X4.</li> </ul>
The burner does NOT fire on space heating: sensor S1 or S2 faulty.	Replace sensor S1 or S2. See <a href="#">"Error codes of the gas boiler"</a> [▶ 201].
Burner does NOT ignite.	See <a href="#">"15.3.12 Symptom: The burner does NOT ignite"</a> [▶ 194].

## 15.3.16 Symptom: The power is reduced

Possible causes	Corrective action
At high rpm, the power has fallen by more than 5%.	<ul style="list-style-type: none"> <li>Check the appliance and flue system for fouling.</li> <li>Clean the appliance and flue system.</li> </ul>

## 15.3.17 Symptom: Space heating does NOT reach the temperature

Possible causes	Corrective action
Weather-dependent setpoint setting is incorrect.	Check the setting on the user interface and adjust if necessary.
Temperature is too low.	Increase the space heating temperature.
No circulation in the installation.	Check whether there is circulation. At least 2 or 3 radiators MUST be open.
The boiler power has NOT been correctly set for the installation.	Adjust the power. See <a href="#">"Maximum space heating power setting"</a> [▶ 160].
No heat transfer as a result of lime scale or fouling in the heat exchanger.	Descale or flush the heat exchanger on the space heating side.

## 15.3.18 Symptom: Hot water does NOT reach the temperature (no tank installed)

**Not applicable for Switzerland**

Possible causes	Corrective action
Domestic hot water flow is too high.	Adjust the inlet assembly.
Temperature setting for water circuit is too low.	Increase the domestic hot water setpoint on the domestic hot water homepage of the user interface.
No heat transfer as a result of lime scale or fouling in the heat exchanger domestic hot water side.	Descale or flush the exchanger domestic hot water side.
Cold water temperature <10°C.	The water inlet temperature is too low.



Possible causes	Corrective action
The domestic hot water temperature fluctuates between hot and cold.	<ul style="list-style-type: none"> <li>The flow is too low. To guarantee comfort, a minimum water flow of 5 l/min is recommended.</li> <li>Increase the domestic hot water setpoint on the domestic hot water homepage of the user interface.</li> </ul>

#### 15.3.19 Symptom: Hot water does NOT reach the temperature (tank installed)

Possible causes	Corrective action
The gas boiler has an error code.	Check the display of the gas boiler for more information.
The indoor unit has an error code.	Check for possible errors on the indoor unit.
The 3-way valve is not working correctly.	<ul style="list-style-type: none"> <li>Check the installation of the 3-way valve.</li> <li>In case of domestic hot water operation, the flow should be directed to the tank.</li> </ul>

### 15.4 Solving problems based on error codes

If the unit runs into a problem, the user interface displays an error code. 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 possible error codes and their descriptions as they appear on the user interface.



#### INFORMATION

See the service manual for:

- The complete list of error codes
- A more detailed troubleshooting guideline for each error

#### 15.4.1 Error codes: Overview

##### Error codes of the indoor unit

Error code	Detailed error code	Description
7H	01	Water flow problem.
7H	04	Water flow problem during domestic hot water production. Manual reset. Check the domestic hot water circuit.

Error code	Detailed error code	Description
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	05	Loosehanging tank temperature sensor
81	00	Leaving water temperature sensor problem. Please contact your dealer.
81	04	Leaving water temperature sensor not properly mounted.
89	01	Heat exchanger frozen.
89	02	Heat exchanger frozen.
89	03	Heat exchanger frozen.
8F	00	Abnormal increase outlet water temperature (DHW).
8H	00	Abnormal increase outlet water temperature.
8H	03	Overheating water circuit (thermostat).

Error code	Detailed error code	Description
A1	00	Zero cross detection problem. Power reset required. Please contact your dealer.
A1	01	EEPROM reading error.
AA	01	Backup heater overheated. Power reset required. Please contact your dealer.
AH	00	Tank disinfection function not completed correctly.
AJ	03	Too long DHW heat-up time required.
C0	00	Flow sensor/switch malfunction. Please contact your dealer.
C4	00	Heat exchanger temperature sensor problem. Please contact your dealer.
CJ	02	Room temperature sensor problem. Please contact your dealer.
EC	00	Abnormal increase tank temperature.
EC	04	Tank preheating
H1	00	External temperature sensor problem. Please contact your dealer.
HC	00	Tank temperature sensor problem. Please contact your dealer.

Error code	Detailed error code	Description
HJ	11	Boiler abnormality detection Check boiler Refer to boiler manual
HJ	12	Bypass valve turning error Please contact your dealer.
U3	00	Under floor heating screed dryout function not completed correctly.
U4	00	Indoor/outdoor unit communication problem.
U5	00	User interface communication problem.
U6	36	Boiler standby abnormality Check boiler Refer to boiler manual
U8	01	Connection with adapter lost  Please contact your dealer.
UA	00	Indoor unit, outdoor unit matching problem. Power reset required.
UA	52	Boiler, indoor unit matching problem. Please contact your dealer.

**NOTICE**

When the minimum water flow is lower than described in the table below, the unit will temporarily stop operation and the user interface will display error 7H-01. After some time, this error will reset automatically and the unit will resume operation.

**Minimum required flow during heat pump operation**

05+08 models	9 l/min
--------------	---------

**Minimum required flow during defrost operation**

05+08 models	9 l/min
--------------	---------

If the 7H-01 error persists, the unit will stop operation and the user interface will display an error code that needs to be reset manually. Depending on the problem, this error code is different:

Error code	Detailed error code	Description
7H	04	The water flow problems mainly occurred during domestic hot water operation. Check the domestic hot water circuit.
7H	05	The water flow problems mainly occurred during space heating operation. Check the space heating circuit.
7H	06	The water flow problems mainly occurred during 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**

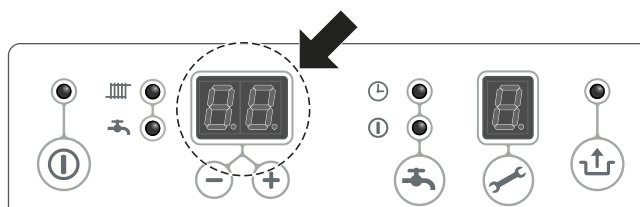
If a U6-36 error occurs, press the gas boiler's On/off button.


**INFORMATION**

If a U4-00 error occurs, the indoor unit cannot communicate with the outdoor unit. When the plate heat exchanger of the indoor unit is freezing, the pump of the indoor unit will be forced ON to prevent freeze-up.

**Error codes of the gas boiler**

The controller on the gas boiler detects faults and indicates them on the display by error codes.



If the LED is flashing, the controller has detected a problem. Once the problem is rectified, the controller can be restarted by pressing the  button.

Following table shows a list of error codes and the possible solutions.

Error code	Cause	Possible solution
10, 11, 12, 13, 14	Sensor fault S1	<ul style="list-style-type: none"> <li>Check wiring</li> <li>Replace S1</li> </ul>

Error code	Cause	Possible solution
20, 21, 22, 23, 24	Sensor fault S2	<ul style="list-style-type: none"> <li>Check wiring</li> <li>Replace S2</li> </ul>
0	Sensor fault after self-check	Replace S1 and/or S2
1	Temperature too high	<ul style="list-style-type: none"> <li>Air in installation</li> <li>Pump is NOT running</li> <li>Insufficient flow in installation</li> <li>Radiators are closed</li> <li>Pump setting is too low</li> </ul>
2	S1 and S2 interchanged	<ul style="list-style-type: none"> <li>Check cable set</li> <li>Replace S1 and S2</li> </ul>
4	No flame signal	<ul style="list-style-type: none"> <li>Gas tap is closed</li> <li>No or incorrect ignition gap</li> <li>Gas supply pressure is too low or fails</li> <li>Gas valve or ignition unit is NOT powered</li> </ul>
5	Poor flame signal	<ul style="list-style-type: none"> <li>Condensate drain blocked</li> <li>Check adjustment of gas valve</li> </ul>
6	Flame detection fault	<ul style="list-style-type: none"> <li>Replace ignition cable and spark plug cap</li> <li>Replace ignition unit</li> <li>Replace boiler controller</li> </ul>
8	Incorrect fan speed	<ul style="list-style-type: none"> <li>Fan catching on casing</li> <li>Wiring between fan and casing</li> <li>Check wiring for poor wire contact</li> <li>Replace fan</li> </ul>
29, 30	Gas valve relay fault	Replace boiler controller

# 16 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.

## In this chapter

16.1	Overview: Disposal .....	203
16.2	To pump down .....	203
16.3	To start and stop forced cooling .....	204

## 16.1 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.

## 16.2 To pump down



## NOTICE

For the Hybrid for Multi, all required precautions must be taken to avoid possible freezing damage at the water heat exchanger before this function is allowed to be used or activated. For detailed information see the indoor installation manual.

**Example:** To protect the environment, pump down when relocating the unit or when disposing of the unit.



## DANGER: RISK OF EXPLOSION

**Pump down – Refrigerant leakage.** If you want to pump down the system, and there is a 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.

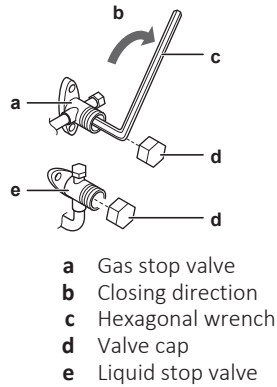


## NOTICE

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.

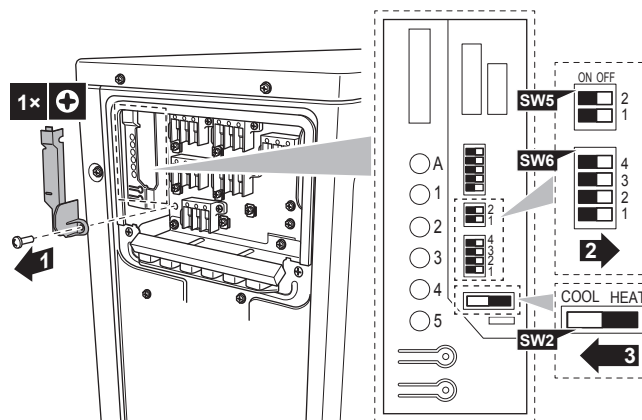
Pump down operation will extract all refrigerant from the system into the outdoor unit.

- 1 Remove the valve cap from the liquid stop valve and the gas stop valve.
- 2 Carry out forced cooling. See "[16.3 To start and stop forced cooling](#)" [[▶ 204](#)].
- 3 After 5 to 10 minutes (after only 1 or 2 minutes in case of very low ambient temperatures ( $<-10^{\circ}\text{C}$ )), close the liquid stop valve with a hexagonal wrench.
- 4 Check on the manifold if the vacuum is reached.
- 5 After 2-3 minutes, close the gas stop valve and stop forced cooling.



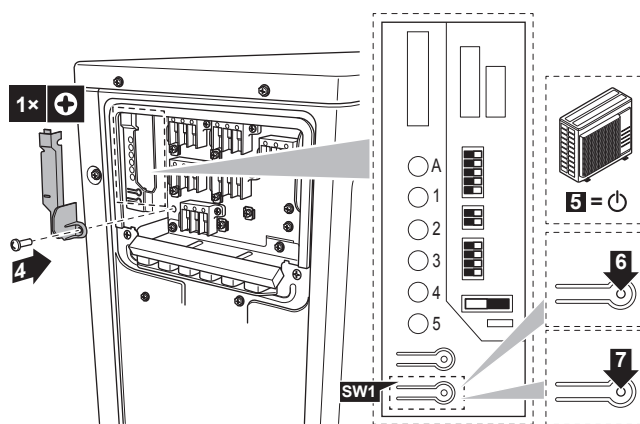
### 16.3 To start and stop forced cooling

- 1 Turn OFF the power, remove the service cover and the switch box cover and the service PCB switch cover.
- 2 Set DIP switch SW5 and SW6 to OFF.
- 3 Set DIP switch SW2 to COOL.



- 4 Reattach the service PCB switch cover.
- 5 Turn ON the outdoor unit.
- 6 Press the forced cooling operation switch SW1 to begin forced cooling.
- 7 Press the forced cooling operation switch SW1 to stop forced cooling.





8 Close switch box cover and service cover.



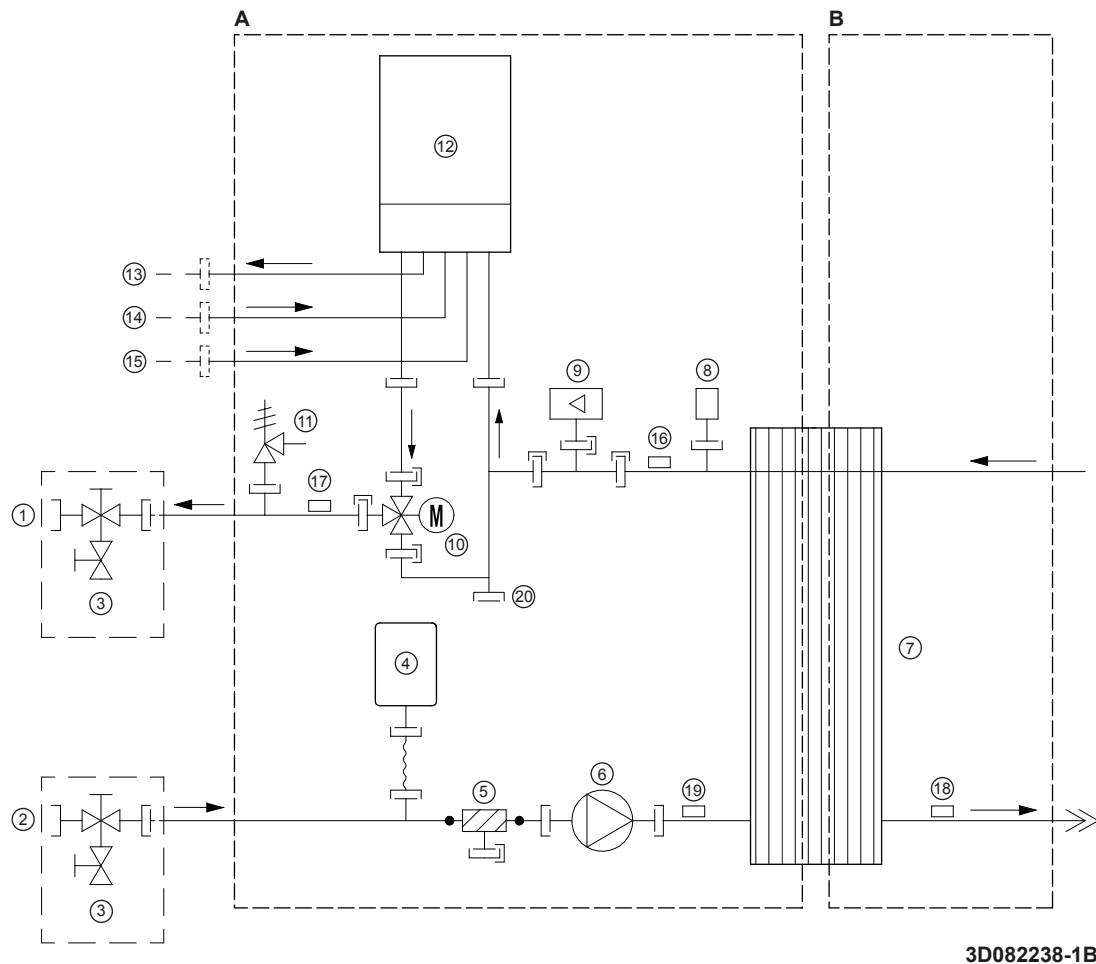
#### NOTICE

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.

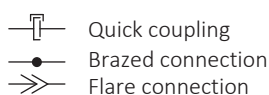
# 17 Technical data

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

## 17.1 Piping diagram: Indoor unit



- A** Water side  
**B** Refrigerant side  
**1** Space heating water IN  
**2** Space heating water OUT  
**3** Shut-off valve with drain/fill valve  
**4** Expansion vessel  
**5** Filter  
**6** Pump  
**7** Plate heat exchanger  
**8** Air purge  
**9** Flow sensor  
**10** 3-way valve  
**11** Safety valve  
**12** Gas boiler  
**13** Domestic hot water: hot water OUT  
**14** Gas pipe  
**15** Domestic hot water: hot water IN  
**16** R1T – Plate heat exchanger outlet water thermistor  
**17** R2T – Outlet water thermistor  
**18** R3T – Heat exchanger liquid pipe thermistor  
**19** R4T – Inlet water thermistor  
**20** Screw connection  
 —|— Screw connection



## 17.2 Wiring diagram: Indoor unit

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

### Notes to go through before starting the unit

English	Translation
Notes to go through before starting the unit	Notes to go through before starting the unit
X1M	Indoor/outdoor communication
X2M	Field wiring terminal for AC
X5M	Field wiring terminal for DC
-----	Earth wiring
-----	Field supply
→ **/12.2	Connection ** continues on page 12 column 2
①	Several wiring possibilities
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB
User installed options	User installed options
<input type="checkbox"/> Domestic hot water tank	<input type="checkbox"/> Domestic hot water tank
<input type="checkbox"/> Domestic hot water tank with solar connection	<input type="checkbox"/> Domestic hot water tank with solar connection
<input type="checkbox"/> Remote user interface	<input type="checkbox"/> Remote user interface
<input type="checkbox"/> Ext. indoor thermistor	<input type="checkbox"/> External indoor thermistor
<input type="checkbox"/> Ext outdoor thermistor	<input type="checkbox"/> External outdoor thermistor
<input type="checkbox"/> Digital I/O PCB	<input type="checkbox"/> Digital I/O PCB
<input type="checkbox"/> Instant DHW recirculation	<input type="checkbox"/> Instant domestic hot water recirculation
Main LWT	Main leaving water temperature
<input type="checkbox"/> On/OFF thermostat (wired)	<input type="checkbox"/> On/OFF thermostat (wired)
<input type="checkbox"/> On/OFF thermostat (wireless)	<input type="checkbox"/> On/OFF thermostat (wireless)
<input type="checkbox"/> Ext. thermistor	<input type="checkbox"/> External thermistor
<input type="checkbox"/> Heat pump convector	<input type="checkbox"/> Heat pump convector
Add LWT	Additional leaving water temperature
<input type="checkbox"/> On/OFF thermostat (wired)	<input type="checkbox"/> On/OFF thermostat (wired)

English	Translation
<input type="checkbox"/> On/OFF thermostat (wireless)	<input type="checkbox"/> On/OFF thermostat (wireless)
<input type="checkbox"/> Ext. thermistor	<input type="checkbox"/> External thermistor
<input type="checkbox"/> Heat pump convector	<input type="checkbox"/> Heat pump convector

#### Position in switch box

English	Translation
Position in switch box	Position in switch box

#### Legend

A1P		Main PCB (hydrobox)
A2P		User interface PCB
A3P	*	On/OFF thermostat
A3P	*	Heat pump convector
A3P	*	Solar pump station PCB
A4P	*	Digital I/O PCB
A4P	*	Receiver PCB (Wireless On/OFF thermostat, PC=power circuit)
B1L		Flow sensor
DS1 (A8P)	*	DIP switch
F1U, F2U	*	Fuse 5 A 250 V for digital I/O PCB (A4P)
FU1		Fuse T 5 A 250 V for main PCB (A1P)
K*R		Relay on PCB
M1P		Main water supply pump
M2P	#	Domestic hot water pump
M2S	#	2-way valve for cooling mode
M3S		3-way valve for floor heating/domestic hot water tank
M4S		Bypass valve for gas boiler
PHC1	*	Optocoupler input circuit
PS		Switching power supply
Q*DI	#	Earth leakage circuit breaker
R1T (A1P)		Outlet water heat exchanger thermistor
R1T (A2P)		Ambient sensor user interface
R1T (A3P)	*	Ambient sensor On/OFF thermostat
R2T (A1P)		Outlet gas boiler thermistor
R2T (A4P)	*	External sensor (floor or ambient)
R3T (A1P)		Refrigerant liquid side thermistor
R4T (A1P)		Inlet water thermistor
R5T (A1P)	*	Domestic hot water thermistor
R6T (A1P)	*	External indoor or outdoor ambient thermistor

R1H (A3P)	*	Humidity sensor
S4S	#	Safety thermostat
SS1 (A4P)	*	Selector switch
TR1, TR2		Power supply transformer
X*M		Terminal strip
X*Y		Connector
	*	= Optional
	#	= Field supply

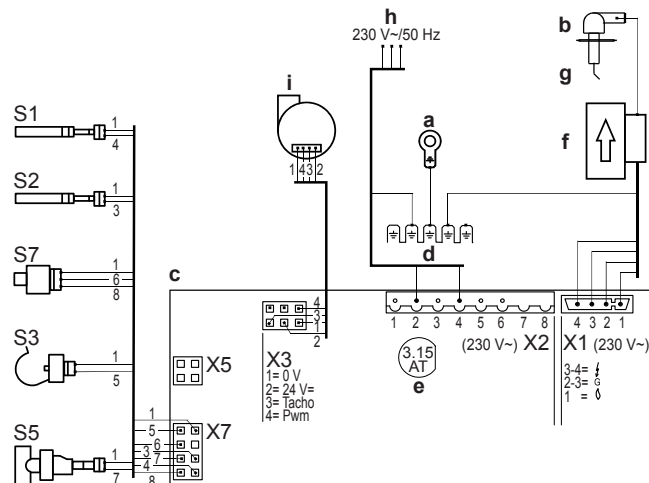
### Translation of text on wiring diagram

English	Translation
(1) Main power connection	(1) Main power connection
Indoor unit supplied from outdoor	Indoor unit supplied from outdoor
Power supply (standard)	Power supply (standard)
Outdoor unit	Outdoor unit
(2) Gas boiler interconnection	(2) Gas boiler interconnection
Gas boiler	Gas boiler
(3) User interface	(3) User interface
Only for remote user interface option	Only for remote user interface option
(4) Domestic hot water tank	(4) Domestic hot water tank
3 wire type SPDT	3 wire type SPDT
3 wire type SPST	3 wire type SPST
(5) Options	(5) Options
230 V AC supplied by PCB	230 V AC supplied by PCB
Continuous	Continuous current
DHW pump output	Domestic hot water pump output
DHW pump	Domestic hot water pump
Ext. ambient sensor option (indoor or outdoor)	Ext. ambient sensor option (indoor or outdoor)
For safety thermostat option	For safety thermostat option
Inrush	Inrush current
Max. load	Maximum load
Normally closed	Normally closed
Normally open	Normally open
Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)	Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)
Shut-off valve	Shut-off valve
(6) Option PCBs	(6) Option PCBs
Alarm output	Alarm output

English	Translation
Max. load	Maximum load
Min. load	Minimum load
Only for solar pump station	Only for solar pump station
Options: solar pump connection, alarm output, On/OFF output	Options: solar pump connection, alarm output, On/OFF output
Refer to operation manual	Refer to operation manual
Solar pump connection	Solar pump connection
Switch box	Switch box
Thermo On/OFF output	Thermo On/OFF output
(7) External room thermostats and heat pump convector	(7) External room thermostats and heat pump convector
Additional LWT zone	Additional leaving water temperature zone
Main LWT zone	Main leaving water temperature zone
Only for external sensor (floor/ambient)	Only for external sensor (floor or ambient)
Only for heat pump convector	Only for heat pump convector
Only for wired thermostat	Only for wired thermostat
Only for wireless thermostat	Only for wireless thermostat



## 17.3 Wiring diagram: Gas boiler



- a** Earth connections heat exchanger
- b** Spark plug cover
- c** Boiler controller
- d** Earth connections boiler controller
- e** Fuse (3.15 A T)
- f** Gas valve and ignition unit
- g** Ionisation/ignition probe
- h** Main voltage
- i** Fan
- S1** Flow sensor
- S2** Return sensor
- S3** Domestic hot water sensor (not applicable for Switzerland)
- S5** Flow switch
- S7** Space heating water pressure sensor
- X1** Gas valve and ignition electrode
- X2** Main power supply (2=L (BRN), 4=N (BLU))
- X3** Power supply fan (230 V)
- X5** Boiler communication cable
- X7** Sensor connection



## 17.4 Table 1 – Maximum refrigerant charge allowed in a room: indoor unit

A <sub>room</sub> (m <sup>2</sup> )	Maximum refrigerant charge in a room (m <sub>max</sub> ) (kg)											
	H=500 mm, 600 mm, 700 mm	H=800 mm	H=900 mm	H=1000 mm	H=1100 mm	H=1200 mm	H=1300 mm	H=1400 mm	H=1500 mm	H=1600 mm	H=1700 mm	H=1800 mm
	h=600 mm	h=700 mm	h=800 mm	h=900 mm	h=1000 mm	h=1100 mm	h=1200 mm	h=1300 mm	h=1400 mm	h=1500 mm	h=1600 mm	h=1700 mm
1	0.14	0.16	0.18	0.21	0.23	0.25	0.28	0.30	0.32	0.34	0.37	0.39
2	0.28	0.32	0.37	0.41	0.46	0.50	0.55	0.60	0.64	0.69	0.73	0.78
3	0.41	0.48	0.55	0.62	0.69	0.76	0.83	0.90	0.96	1.03	1.10	1.17
4	0.55	0.64	0.73	0.83	0.92	1.01	1.10	1.19	1.29	1.38	1.47	1.56
5	0.69	0.80	0.92	1.03	1.15	1.26	1.38	1.49	1.61	1.72	1.84	1.95
6	0.83	0.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.07	2.20	2.34
7	0.90	1.05	1.20	1.35	1.51	1.66	1.81	1.96	2.11	2.26	2.41	2.56
8	0.97	1.13	1.29	1.45	1.61	1.77	1.93	2.09	2.25	2.41	2.57	2.74
9	1.02	1.19	1.37	1.54	1.71	1.88	2.05	2.22	2.39	2.56	2.73	2.90
10	1.08	1.26	1.44	1.62	1.80	1.98	2.16	2.34	2.52	2.70	2.88	3.06
11	1.13	1.32	1.51	1.70	1.89	2.08	2.26	2.45	2.64	2.83	3.02	3.21
12	1.18	1.38	1.58	1.77	1.97	2.17	2.37	2.56	2.76	2.96	3.15	3.35
13	1.23	1.44	1.64	1.85	2.05	2.26	2.46	2.67	2.87	3.08	3.28	3.49
14	1.28	1.49	1.70	1.92	2.13	2.34	2.55	2.77	2.98	3.19	3.41	3.62
15	1.32	1.54	1.76	1.98	2.20	2.42	2.64	2.86	3.09	3.31	3.53	3.75
16	1.37	1.59	1.82	2.05	2.28	2.50	2.73	2.96	3.19	3.41	3.64	3.87
17	1.41	1.64	1.88	2.11	2.35	2.58	2.82	3.05	3.28	3.52	3.75	3.99
18	1.45	1.69	1.93	2.17	2.41	2.66	2.90	3.14	3.38	3.62	3.86	4.10
19	1.49	1.74	1.98	2.23	2.48	2.73	2.98	3.22	3.47	3.72	3.97	4.22
20	1.53	1.78	2.04	2.29	2.54	2.80	3.05	3.31	3.56	3.82	4.07	4.33
21	1.56	1.83	2.09	2.35	2.61	2.87	3.13	3.39	3.65	3.91	4.17	4.43
22	1.60	1.87	2.13	2.40	2.67	2.94	3.20	3.47	3.74	4.00	4.27	4.54
23	1.64	1.91	2.18	2.46	2.73	3.00	3.27	3.55	3.82	4.09	4.37	4.64
24	1.67	1.95	2.23	2.51	2.79	3.07	3.34	3.62	3.90	4.18	4.46	4.74
25	1.71	1.99	2.28	2.56	2.84	3.13	3.41	3.70	3.98	4.27	4.55	4.84
26	1.74	2.03	2.32	2.61	2.90	3.19	3.48	3.77	4.06	4.35	4.64	4.93
27	1.77	2.07	2.37	2.66	2.96	3.25	3.55	3.84	4.14	4.43	4.73	5.03
28	1.81	2.11	2.41	2.71	3.01	3.31	3.61	3.91	4.22	4.52	4.82	5.12
29	1.84	2.14	2.45	2.76	3.06	3.37	3.68	3.98	4.29	4.60	4.90	5.21
30	1.87	2.18	2.49	2.80	3.12	3.43	3.74	4.05	4.36	4.67	4.99	5.30
31	1.90	2.22	2.53	2.85	3.17	3.48	3.80	4.12	4.44	4.75	5.07	5.39
32	1.93	2.25	2.57	2.90	3.22	3.54	3.86	4.18	4.51	4.83	5.15	5.47
33	1.96	2.29	2.61	2.94	3.27	3.60	3.92	4.25	4.58	4.90	5.23	5.56
34	1.99	2.32	2.65	2.99	3.32	3.65	3.98	4.31	4.64	4.98	5.31	5.64
35	2.02	2.36	2.69	3.03	3.37	3.70	4.04	4.38	4.71	5.05	5.39	5.72
36	2.05	2.39	2.73	3.07	3.41	3.76	4.10	4.44	4.78	5.12	5.46	5.80
37	2.08	2.42	2.77	3.11	3.46	3.81	4.15	4.50	4.85	5.19	5.54	5.88
38	2.10	2.46	2.81	3.16	3.51	3.86	4.21	4.56	4.91	5.26	5.61	5.96
39	2.13	2.49	2.84	3.20	3.55	3.91	4.26	4.62	4.97	5.33	5.69	6.04
40	2.16	2.52	2.88	3.24	3.60	3.96	4.32	4.68	5.04	5.40	5.76	6.12
41	2.19	2.55	2.91	3.28	3.64	4.01	4.37	4.74	5.10	5.46	5.83	6.19
42	2.21	2.58	2.95	3.32	3.69	4.06	4.42	4.79	5.16	5.53	5.90	6.27
43	2.24	2.61	2.98	3.36	3.73	4.10	4.48	4.85	5.22	5.60	5.97	6.34
44	2.26	2.64	3.02	3.40	3.77	4.15	4.53	4.91	5.28	5.66	6.04	6.42
45	2.29	2.67	3.05	3.44	3.82	4.20	4.58	4.96	5.34	5.73	6.11	6.49
46	2.32	2.70	3.09	3.47	3.86	4.24	4.63	5.02	5.40	5.79	6.17	6.56

$A_{room}$ (m <sup>2</sup> )	Maximum refrigerant charge in a room ( $m_{max}$ ) (kg)											
	H=500 mm, 600 mm, 700 mm	H=800 mm	H=900 mm	H=1000 mm	H=1100 mm	H=1200 mm	H=1300 mm	H=1400 mm	H=1500 mm	H=1600 mm	H=1700 mm	H=1800 mm
	h=600 mm	h=700 mm	h=800 mm	h=900 mm	h=1000 mm	h=1100 mm	h=1200 mm	h=1300 mm	h=1400 mm	h=1500 mm	h=1600 mm	h=1700 mm
47	2.34	2.73	3.12	3.51	3.90	4.29	4.68	5.07	5.46	5.85	6.24	6.63
48	2.37	2.76	3.15	3.55	3.94	4.34	4.73	5.12	5.52	5.91	6.31	6.70
49	2.39	2.79	3.19	3.58	3.98	4.38	4.78	5.18	5.58	5.97	6.37	6.77
50	2.41	2.82	3.22	3.62	4.02	4.43	4.83	5.23	5.63	6.03	6.44	6.84

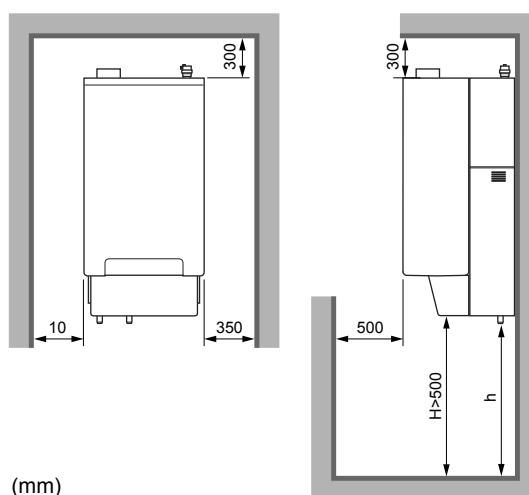


#### INFORMATION

- h=The height measured from the floor to the flare nut.
- H=The height measured from the floor to the bottom of the casing.
- For intermediate H values (i.e., when H is between 2 H values from the table), consider the value that corresponds to the lower H value from the table. If H=950 mm, consider the value that corresponds to "H=900 mm".
- In cases where H≤600 mm, h is always considered to be 600 mm, as specified in IEC 60335-2-40:2013 A1 2016, clause GG2.
- For intermediate  $A_{room}$  values (i.e., when  $A_{room}$  is between 2  $A_{room}$  values from the table), consider the lower  $A_{room}$  value from the table. If  $A_{room}=12.5$  m<sup>2</sup>, consider the value that corresponds to " $A_{room}=12$  m<sup>2</sup>".
- Systems with a total refrigerant charge ( $m_c$ ) ≤1.842 kg are NOT subjected to any requirements to the installation room.

## 17.5 Table 2 – Minimum floor area: indoor unit

$m_c$ (kg)	Minimum floor area (m <sup>2</sup> )											
	H=500 mm, 600 mm, 700 mm	H=800 mm	H=900 mm	H=1000 mm	H=1100 mm	H=1200 mm	H=1300 mm	H=1400 mm	H=1500 mm	H=1600 mm	H=1700 mm	H=1800 mm
	h=600 mm	h=700 mm	h=800 mm	h=900 mm	h=1000 mm	h=1100 mm	h=1200 mm	h=1300 mm	h=1400 mm	h=1500 mm	h=1600 mm	h=1700 mm
1.80	27.80	20.43	15.64	12.36	10.01	8.27	6.95	6.03	5.60	5.23	4.90	4.61
1.90	30.98	22.76	17.42	13.77	11.15	9.22	7.74	6.60	5.91	5.52	5.17	4.87
2.00	34.32	25.22	19.31	15.25	12.36	10.21	8.58	7.31	6.30	5.81	5.45	5.13
2.10	37.84	27.80	21.29	16.82	13.62	11.26	9.46	8.06	6.95	6.10	5.72	5.38
2.20	41.53	30.51	23.36	18.46	14.95	12.36	10.38	8.85	7.63	6.64	5.99	5.64
2.30	45.39	33.35	25.53	20.17	16.34	13.50	11.35	9.67	8.34	7.26	6.38	5.90
2.40	49.42	36.31	27.80	21.97	17.79	14.70	12.36	10.53	9.08	7.91	6.95	6.16
2.50	53.63	39.40	30.17	23.83	19.31	15.96	13.41	11.42	9.85	8.58	7.54	6.68
2.6	58.00	42.62	32.63	25.78	20.88	17.26	14.50	12.36	10.65	9.28	8.16	7.23
2.7	62.55	45.96	35.19	27.80	22.52	18.61	15.64	13.32	11.49	10.01	8.80	7.79
2.8	67.27	49.42	37.84	29.90	24.22	20.01	16.82	14.33	12.36	10.76	9.46	8.38
2.9	72.16	53.02	40.59	32.07	25.98	21.47	18.04	15.37	13.25	11.55	10.15	8.99
3	77.22	56.74	43.44	34.32	27.80	22.98	19.31	16.45	14.18	12.36	10.86	9.62
3.1	82.46	60.58	46.38	36.65	29.69	24.53	20.61	17.57	15.15	13.19	11.60	10.27
3.2	87.86	64.55	49.42	39.05	31.63	26.14	21.97	18.72	16.14	14.06	12.36	10.95
3.3	93.44	68.65	52.56	41.53	33.64	27.80	23.36	19.90	17.16	14.95	13.14	11.64

**INFORMATION**

- h=The height measured from the floor to the flare nut.
- H=The height measured from the floor to the bottom of the casing.
- For intermediate H values (i.e., when H is between 2 H values from the table), consider the value that corresponds to the lower H value from the table. If H=950 mm, consider the value that corresponds to "H=900 mm".
- In cases where H≤600 mm, h is always considered to be 600 mm, as specified in IEC 60335-2-40:2013 A1 2016, clause GG2.
- For intermediate  $m_c$  values (i.e., when  $m_c$  is between 2  $m_c$  values from the table), consider the value that corresponds to the higher  $m_c$  value from the table. If  $m_c=2.35$  kg, consider " $m_c=2.4$  kg".
- Systems with a total refrigerant charge ( $m_c$ ) ≤1.842 kg are NOT subjected to any requirements to the installation room.

## 17.6 Table 3 – Minimum bottom opening area for natural ventilation: indoor unit

	$m_c$ (kg)	$dm=m_c-m_{max}$ (kg)	Minimum bottom opening area (cm <sup>2</sup> )											
			H=500 mm, 600 mm, 700 mm	H=800 mm	H=900 mm	H=1000 m m	H=1100 m m	H=1200 m m	H=1300 m m	H=1400 m m	H=1500 m m	H=1600 m m	H=1700 m m	H=1800 m m
			h=600 mm	h=700 mm	h=800 mm	h=900 mm	h=1000 m m	h=1100 m m	h=1200 m m	h=1300 m m	h=1400 m m	h=1500 m m	h=1600 m m	h=1700 m m
3MXM52	1.8	Systems with a total refrigerant charge ( $m_c$ ) $\leq 1.842$ kg are NOT subjected to any requirements to the installation room.												
3MXM52 + 3MXM68 + 4MXM68	2	1.80	732	678	634	598	567	541	518	498	480	463	449	435
		1.60	651	603	564	532	504	481	460	442	426	412	399	387
		1.40	570	527	493	465	441	421	403	387	373	360	349	339
		1.20	488	452	423	399	378	361	345	332	320	309	299	290
		1.00	442	379	353	332	315	301	288	277	267	258	249	242
		0.80	388	332	291	266	252	241	230	221	213	206	200	194
		0.60	314	269	236	210	189	181	173	166	160	155	150	145
		0.40	224	192	168	150	135	122	115	111	107	103	100	97
		0.20	119	102	89	80	72	65	60	56	54	52	50	49
		0.00												
	2.2	1.98	805	746	698	658	624	595	570	547	527	510	493	479
		1.76	716	663	620	585	555	529	506	487	469	453	439	426
		1.54	627	580	543	512	485	463	443	426	410	396	384	372
		1.32	548	497	465	439	416	397	380	365	352	340	329	319
		1.10	510	437	388	366	347	331	317	304	293	283	274	266
		0.88	447	383	336	298	278	265	253	244	235	227	220	213
		0.66	362	311	272	242	218	199	190	183	176	170	165	160
		0.44	258	222	194	172	155	141	129	122	118	114	110	107
		0.22	137	118	103	92	83	75	69	64	59	57	55	54
		0.00												
3MXM68 + 4MXM68 + 4MXM80 + 5MXM90	2.4	2.16	879	813	761	717	681	649	621	597	575	556	538	522
		1.92	781	723	676	638	605	577	552	531	511	494	478	464
		1.68	683	633	592	558	530	505	483	464	448	432	419	406
		1.44	624	542	507	478	454	433	414	398	384	371	359	348
		1.20	581	498	436	399	378	361	345	332	320	309	299	290
		0.96	510	437	382	340	306	289	276	266	256	247	239	232
		0.72	413	354	310	275	248	225	207	199	192	186	180	174
		0.48	294	252	221	196	177	161	147	136	128	124	120	116
		0.24	156	134	117	104	94	86	78	72	67	63	60	58
		0.00												
4MXM68 + 4MXM80 + 5MXM90	2.6	2.34	952	881	824	777	737	703	673	647	623	602	583	566
		2.08	846	783	733	691	655	625	598	575	554	535	518	503
		1.82	740	685	641	605	574	547	524	503	485	468	454	440
		1.56	703	603	550	518	492	469	449	431	416	402	389	377
		1.30	655	562	492	437	410	391	374	360	346	335	324	314
		1.04	574	492	431	383	345	314	299	288	277	268	259	252
		0.78	465	399	349	310	279	254	233	216	208	201	195	189
		0.52	332	285	249	221	199	181	166	153	143	134	130	126
		0.26	176	151	132	118	106	96	88	82	76	71	66	63
		0.00												

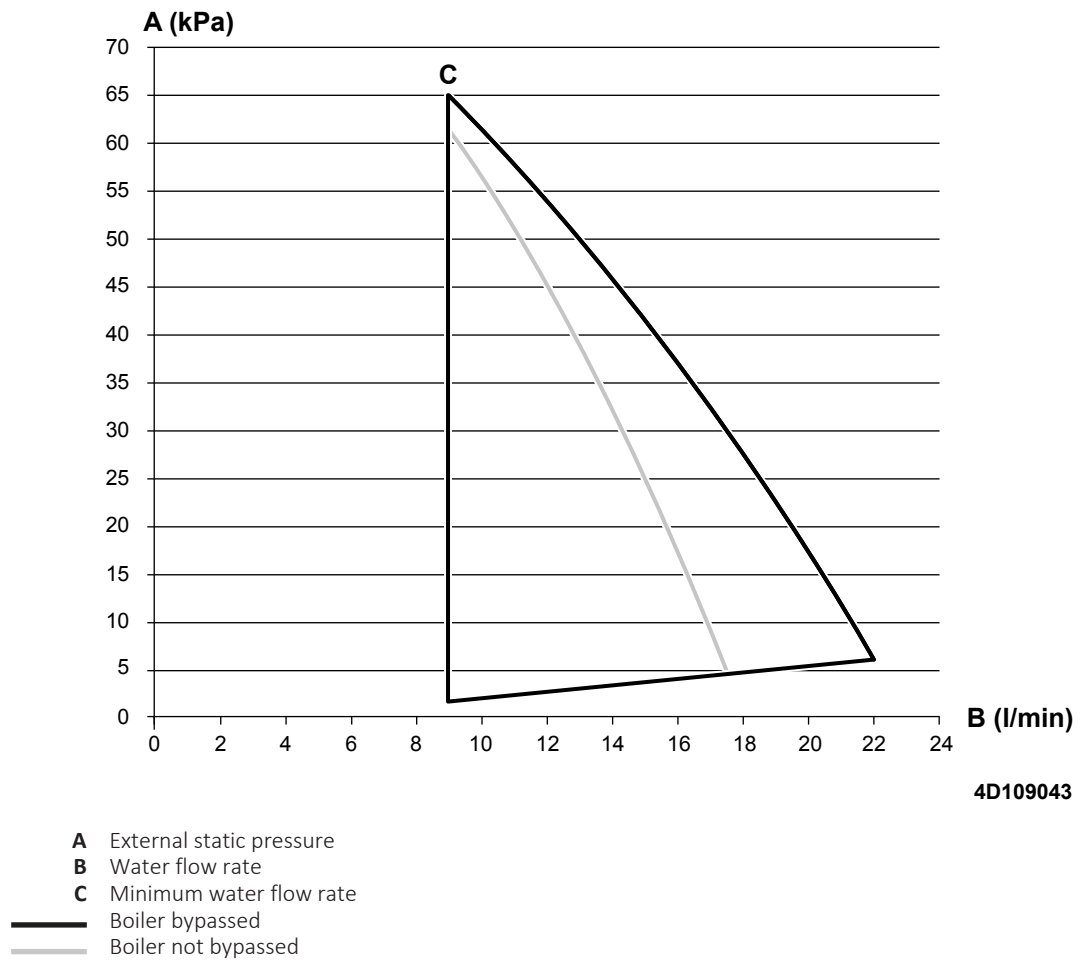
	m <sub>c</sub> (kg)	dm=m <sub>c</sub> - m <sub>max</sub> (kg)	Minimum bottom opening area (cm²)											
			H=500 mm, 600 mm, 700 mm	H=800 mm	H=900 mm	H=1000 m m	H=1100 m m	H=1200 m m	H=1300 m m	H=1400 m m	H=1500 m m	H=1600 m m	H=1700 m m	H=1800 m m
			h=600 mm	h=700 mm	h=800 mm	h=900 mm	h=1000 m m	h=1100 m m	h=1200 m m	h=1300 m m	h=1400 m m	h=1500 m m	h=1600 m m	h=1700 m m
4MXM80 + 5MXM90	2.8	2.52	1025	949	888	837	794	757	725	696	671	648	628	609
		2.24	911	844	789	744	706	673	644	619	597	576	558	541
		1.96	797	738	691	651	618	589	564	542	522	504	488	474
		1.68	786	674	592	558	530	505	483	464	448	432	419	406
		1.40	732	628	549	488	441	421	403	387	373	360	349	339
		1.12	642	550	482	428	385	350	322	310	299	288	279	271
		0.84	520	446	390	347	312	284	260	240	224	216	210	203
		0.56	371	318	278	247	223	203	186	171	159	149	140	136
		0.28	197	169	148	131	118	108	99	91	85	79	74	70
		0.00												
	3	2.70	1098	1017	951	897	851	811	777	746	719	695	673	653
		2.40	976	904	845	797	756	721	690	663	639	618	598	580
		2.10	881	791	740	698	662	631	604	580	559	540	523	508
		1.80	872	747	654	598	567	541	518	498	480	463	449	435
		1.50	812	696	609	542	488	451	432	415	400	386	374	363
		1.20	712	610	534	475	427	389	356	332	320	309	299	290
		0.90	577	494	433	385	346	315	289	266	247	232	225	218
		0.60	411	353	309	274	247	225	206	190	177	165	155	145
		0.30	218	187	164	146	131	119	109	101	94	88	82	77
		0.00												
	3.2	2.88	1171	1084	1014	956	907	865	828	796	767	741	717	696
		2.56	1041	964	902	850	807	769	736	708	682	659	638	619
		2.24	970	844	789	744	706	673	644	619	597	576	558	541
		1.92	960	823	720	640	605	577	552	531	511	494	478	464
		1.60	895	767	671	597	537	488	460	442	426	412	399	387
		1.28	784	672	588	523	471	428	392	362	341	330	319	310
		0.96	635	545	477	424	381	347	318	294	273	254	239	232
		0.64	453	388	340	302	272	247	227	209	194	181	170	160
		0.32	240	206	180	160	144	131	120	111	103	96	90	85
		0.00												
5MXM90	3.3	2.97	1208	1118	1046	986	936	892	854	821	791	764	740	718
		2.64	1074	994	930	877	832	793	759	730	703	679	658	638
		2.31	1016	871	814	767	728	694	665	638	615	594	576	558
		1.98	1006	862	754	671	624	595	570	547	527	510	493	479
		1.65	937	803	703	625	562	511	475	456	440	425	411	399
		1.32	821	704	616	548	493	448	411	379	352	340	329	319
		0.99	665	570	499	444	399	363	333	307	285	266	250	240
		0.66	474	407	356	316	285	259	237	219	204	190	178	168
		0.33	252	216	189	168	151	138	126	116	108	101	95	89
		0.00												

**INFORMATION**

- h=Height measured from the floor to the flare nut.
- H=Height measured from the floor to the bottom of the casing.
- In cases where  $H \leq 600$  mm, h is always considered to be 600 mm, as specified in IEC 60335-2-40:2013 A1 2016 Clause GG2.
- For intermediate H values (i.e., when H is between 2 H values from the table), consider the value that corresponds to the lower H value from the table. If  $H=950$  mm, consider the value that corresponds to " $H=900$  mm".
- For intermediate dm values (i.e., when dm is between 2 dm values from the table), consider the higher dm value from the table. For 3MXM52 with  $m_c=2$  kg and  $dm=0.25$  kg, consider " $dm=0.4$  kg".

## 17.7 ESP curve: Indoor unit

**Note:** A flow error will occur when the minimum water flow rate is not reached.



**Note:** Selecting a flow outside the area of operation can cause damage or malfunction of the unit. Make sure water quality complies with EU directive 2020/2184.

## 17.8 Technical specifications: Gas boiler

### 17.8.1 General

	<b>EHYKOMB33AA*</b>
Condensing boiler	Yes
Low-temperature boiler	No
B1 boiler	No
Cogeneration space heater	No
Combination heater	Yes
Related heat pump model	CHYHBH05/CHYHBH08
Function	Heating – Domestic hot water
Heat pump module	CHYHBH05
	CHYHBH08
Device category <sup>(1)</sup>	C <sub>13(x)</sub> , C <sub>33(x)</sub> , C <sub>43(x)</sub> , C <sub>53(x)</sub> , C <sub>63(x)</sub> , C <sub>83(x)</sub> , C <sub>93(x)</sub>
<b>Gas</b>	
Gas consumption (G20, Natural gas E/H)	0.79~3.39 m <sup>3</sup> /h
Gas consumption (G25, Natural gas LL/L)	0.89~3.92 m <sup>3</sup> /h
Gas consumption (G31, Liquefied Propane gas)	0.30~1.29 m <sup>3</sup> /h
Maximum flue gas temperature domestic hot water	70°C
Massive flow glue gas (maximum)	15.1 g/s
Available fan pressure	75 Pa
NOx class	6
NOx	36 mg/kWh
P <sub>1</sub> at 30% of rated input (30/37)	8.8 kW
P <sub>4</sub> rated output (80/60)	26.6 kW
η <sub>1</sub> efficiency at P <sub>1</sub>	97.5%
η <sub>4</sub> efficiency at P <sub>4</sub>	88.8%
Standby heat loss (P <sub>stby</sub> )	0.038 kW
Daily fuel consumption, Q <sub>fuel</sub>	22.514 kWh
Daily electricity consumption, Q <sub>elec</sub>	0.070 kWh
<b>Central heating</b>	
Maximum pressure space heating circuit	3 bar
Maximum space heating water temperature	90°C
Nominal load (upper value) Q <sub>n</sub> (H <sub>s</sub> )	8.4~30.0 kW
Nominal load (lower value) Q <sub>n</sub> (H <sub>i</sub> )	7.6~27.0 kW
Output at 80/60°C (P <sub>n</sub> )	7.5~26.6 kW

<sup>(1)</sup> Index 'x' only valid for DE.



	<b>EHYKOMB33AA*</b>
Nominal output	8.2~26.6 kW
Efficiency space heating (net calorific value 80/60) $\eta_{100}$	98.7%
Efficiency space heating (net calorific value 37/30 - 30%) $\eta_{30}$	108.3%
Operation range	30~90°C
Pressure drop	See "17.7 ESP curve: Indoor unit" [▶ 219].
<b>Domestic hot water (not applicable for Switzerland)</b>	
Nominal load domestic hot water $Q_{nw}$ ( $H_s$ )	8.4~36.3 kW
Nominal load domestic hot water $Q_{nw}$ ( $H_i$ )	7.6~32.7 kW
Maximum water pressure PMW	8 bar
Efficiency domestic hot water (net calorific value)	105%
Operation range	40~65°C
Domestic hot water flow rate (setpoint 60°C)	9 l/min
Domestic hot water flow rate (setpoint 40°C)	15 l/min
Domestic water threshold	2 l/min.
Effective unit wait time	<1 sec
Domestic water side pressure difference	See "11.3.1 Flow resistance graph for appliance domestic hot water circuit" [▶ 166].
<b>Casing</b>	
Colour	White – RAL9010
Material	Pre-coated sheet metal
<b>Dimensions</b>	
Packing (H×W×D)	900×500×300 mm
Unit (H×W×D)	710×450×240 mm
Machine net weight	36 kg
Packed machine weight	37 kg
Packing material	Carton/PP (straps)
Packing material (weight)	1 kg
Boiler water volume	4 l
<b>Main components</b>	
Water side heat exchanger	Aluminium, copper
<b>Space heating water circuit</b>	
Space heating piping connections	Ø22 mm
Piping material	Cu
Safety valve	See indoor unit manual

	<b>EHYKOMB33AA*</b>
Manometer	Digital
Drain/fill valve	No (optional in connection set)
Shut-off valves	No (optional in connection set)
Air purge valve	Yes (manual)
<b>Domestic hot water circuit (not applicable for Switzerland)</b>	
Domestic hot water piping connections	Ø15 mm
Piping material	Cu
<b>Gas/flue gas</b>	
Gas connection	Ø15 mm
Flue gas/combustion air connection	Concentric connection Ø60/100 mm
<b>Electrical</b>	
Power supply voltage	230 V
Power supply phase	1~
Power supply frequency	50 Hz
IP class	IPX4D
Absorbed power: full load	80 W
Absorbed power: standby	2 W
Auxiliary electricity consumption at full load (elmax)	0.040 kW
Auxiliary electricity consumption at part load (elmin)	0.015 kW
Auxiliary electricity consumption in standby mode ( $P_{SB}$ )	0.002 kW
<b>Radio module</b>	
Power supply	230 V AC mains powered
Frequency range	868.3 MHz
Effective Radiated Power (ERP)	12.1 dBm

## 17.8.2 Energy-related products specifications

## Technical product file in accordance to CELEX-32013R0811

<b>Supplier</b>			<b>Daikin Europe N.V., Zandvoordestraat 300, BE-8400 Oostende, Belgium</b>
<b>Type designation</b>			<b>EHYKOMB33AA*</b>
Seasonal space heating energy efficiency class	—	—	A
Heat rated output	Prated	kW	27
Annual energy consumption	$Q_{HE}$	GJ	53
Seasonal space heating energy efficiency	$\eta_s$	%	93

Supplier			Daikin Europe N.V., Zandvoordestraat 300, BE-8400 Oostende, Belgium
Type designation			EHYKOMB33AA*
Sound power level	$L_{WA}$	dB	50
Declared load profile	—	—	XL
Water heating energy efficiency class	—	—	A
Annual electricity consumption	AEC	kWh	15
Annual fuel consumption	AFC	GJ	18
Water heating energy efficiency	$\eta_{WH}$	%	84
Efficiency class controller	—	—	II
Contribution to yearly efficiency	—	%	2.0
<b>IMPORTANT</b> <ul style="list-style-type: none"> <li>▪ Please read all instructions before fitting this appliance.</li> <li>▪ This appliance is not intended for use of persons (including children) with diminished physical, sensory or mental ability, or lack of experience and knowledge, unless supervised by, or instruction about the use of the appliance by a person who is responsible for their safety.</li> <li>▪ The appliance and installation should every year be inspected by a qualified installer and cleaned when necessary.</li> <li>▪ The appliance can be cleaned with a damp cloth. Do not use aggressive or abrasive cleaning or solvent.</li> </ul>			

### 17.8.3 Appliance category and supply pressure

Country code (EN 437)	Country	Gas category	Default setting	After conversion to G25	After conversion to G31
AT	Austria	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (50 mbar)
BA	Bosnia and Herzegovina	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
BE	Belgium <sup>(1)</sup>	I <sub>2E(s)</sub> , I <sub>3P</sub>	G20/G25 (20/25 mbar)	—	—
BG	Bulgaria	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (30 mbar)
CH	Switzerland	I <sub>2H</sub> , II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar, 50 mbar)
CY	Cyprus	I <sub>2H</sub>	G20 (20 mbar)	—	—
CZ	Czech Republic	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
DE	Germany	II <sub>2ELL3P</sub>	G20 (20 mbar)	G25 (20 mbar)	G31 (50 mbar)
DK	Denmark	I <sub>2H</sub>	G20 (20 mbar)	—	—
ES	Spain	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
FR	France	II <sub>2ESi3P</sub>	G20/G25 (20/25 mbar)	—	G31 (37 mbar)

<sup>(1)</sup> Any modifications to the gas valve MUST be performed by a certified representative of the manufacturer. For more information, contact your dealer.

Country code (EN 437)	Country	Gas category	Default setting	After conversion to G25	After conversion to G31
GB	United Kingdom	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
GR	Greece	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
HR	Croatia	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
HU	Hungary	I <sub>2H</sub>	G20 (25 mbar)	—	—
IE	Ireland	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
IT	Italy	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
LT	Lithuania	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
LV	Latvia	I <sub>2H</sub>	G20 (20 mbar)	—	—
MT	Malta	I <sub>3P</sub>	—	—	G31 (30 mbar)
PL	Poland	II <sub>2E3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
PT	Portugal	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
RO	Romania	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (30 mbar)
SI	Slovenia	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar)
SK	Slovakia	II <sub>2H3P</sub>	G20 (20 mbar)	—	G31 (37 mbar, 50 mbar)
TR	Turkey	I <sub>2H</sub>	G20 (20 mbar)	—	—
UA	Ukraine	II <sub>2H</sub>	G20 (20 mbar)	—	—

## GAS BOILER SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the boiler as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission according to the manufacturer's instructions and complete this Benchmark Commissioning Checklist will invalidate the warranty. This does not affect the customer's statutory rights.

Customer name:		Telephone number:	
Address:			
Boiler make and model:			
Boiler serial number:			
Commissioned by (PRINT NAME):		Gas Safe register number:	
Company name:		Telephone number:	
Company address:			
		Commissioning date:	
<b>To be completed by the customer on receipt of a Building Regulations Compliance Certificate*</b>			
Building Regulations Notification Number (if applicable):			
<b>CONTROLS</b> (tick the appropriate boxes)			
Time and temperature control to heating	Room thermostat and programmer/timer		Programmable room thermostat
	Load/weather compensation		Optimum start control
Time and temperature control to hot water	Cylinder thermostat and programmer/timer		Combination Boiler
Heating zone valves	Fitted		Not required
Hot water zone valves	Fitted		Not required
Thermostatic radiator valves	Fitted		Not required
Automatic bypass to system	Fitted		Not required
Boiler interlock			Provided
<b>ALL SYSTEMS</b>			
The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions			Yes
What system cleaner was used?			
What inhibitor was used?			Quantity litres
Has a primary water system filter been installed?			Yes No
<b>CENTRAL HEATING MODE</b> measure and record:			
Gas rate	m <sup>3</sup> /hr	OR	ft <sup>3</sup> /hr
Burner operating pressure (if applicable)	mbar	OR Gas inlet pressure	mbar
Central heating flow temperature	°C		
Central heating return temperature	°C		
<b>COMBINATION BOILERS ONLY</b>			
Is the installation in a hard water area (above 200ppm)?			Yes No
If yes, and if required by the manufacturer, has a water scale reducer been fitted?			Yes No
What type of scale reducer has been fitted?			
<b>DOMESTIC HOT WATER MODE</b> Measure and Record:			
Gas rate	m <sup>3</sup> /hr	OR	ft <sup>3</sup> /hr
Burner operating pressure (at maximum rate)	mbar	OR Gas inlet pressure at maximum rate	mbar
Cold water inlet temperature	°C		
Hot water has been checked at all outlets	Yes	Temperature	°C
Water flow rate	l/min		
<b>CONDENSING BOILERS ONLY</b>			
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798			Yes
The flue gas piping has been installed in accordance with the manufacturer's instructions and/or local legislation.			Yes
<b>ALL INSTALLATIONS</b>			
Record the following:	At max. rate:	CO	ppm AND CO/CO <sub>2</sub> Ratio
	At min. rate: (where possible)	CO	ppm AND CO/CO <sub>2</sub> Ratio
The heating and hot water system complies with the appropriate Building Regulations			Yes
The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions			Yes
The operation of the boiler and system controls have been demonstrated to and understood by the customer			Yes
The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer			Yes
Commissioning Engineer's Signature			
Customer's Signature			
(To confirm satisfactory demonstration and receipt of manufacturer's literature)			

\*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



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SERVICE RECORD

It is recommended that your heating system is serviced regularly and that the appropriate Service Interval Record is completed.

Service Provider

Before completing the appropriate Service Record below, please ensure you have carried out the service as described in the manufacturer's instructions. Always use the manufacturer's specified spare part when replacing controls.

<b>SERVICE 01</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 02</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 03</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 04</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 05</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 06</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 07</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 08</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 09</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

<b>SERVICE 10</b>		Date:	
Engineer name:			
Company name:			
Telephone No:			
Gas safe register No:			
Record:	At max. rate:	CO ppm	AND CO <sub>2</sub> %
	At min. rate: (Where Possible)	CO ppm	AND CO <sub>2</sub> %
Comments:			
Signature			

\*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.



# 18 Glossary

**Dealer**

Sales distributor for the product.

**Authorised 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

### Applicable indoor units

CHYHBH05AAV32  
CHYHBH08AAV32  
CHYHBH05AFV32  
CHYHBH08AFV32

### Notes

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Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step Default value	Date	Value
User settings						
└ Preset values						
└ Room temperature						
7.4.1.1		Comfort (heating)	R/W	[3-07]~[3-06], step: A.3.2.4 <b>21°C</b>		
7.4.1.2		Eco (heating)	R/W	[3-07]~[3-06], step: A.3.2.4 <b>19°C</b>		
└ LWT main						
7.4.2.1	[8-09]	Comfort (heating)	R/W	[9-01]~[9-00], step: 1°C <b>45°C</b>		
7.4.2.2	[8-0A]	Eco (heating)	R/W	[9-01]~[9-00], step: 1°C <b>40°C</b>		
7.4.2.5		Comfort (heating)	R/W	-10~-10°C, step: 1°C <b>0°C</b>		
7.4.2.6		Eco (heating)	R/W	-10~-10°C, step: 1°C <b>-2°C</b>		
└ Tank temperature						
7.4.3.1	[6-0A]	Storage comfort	R/W	30~[6-0E]°C, step: 1°C <b>60°C</b>		
7.4.3.2	[6-0B]	Storage eco	R/W	30~min(50, [6-0E]) °C, step: 1°C <b>50°C</b>		
7.4.3.3	[6-0C]	Reheat	R/W	30~min(50, [6-0E]) °C, step: 1°C <b>50°C</b>		
└ Electricity price						
7.4.5.1	[C-0C] [D-0C]	High	R/W	0,00~990/kWh <b>20/kWh</b>		
7.4.5.2	[C-0D] [D-0D]	Medium	R/W	0,00~990/kWh <b>20/kWh</b>		
7.4.5.3	[C-0E] [D-0E]	Low	R/W	0,00~990/kWh <b>15/kWh</b>		
└ Fuel price						
7.4.6			R/W	0,00~990/kWh 0,00~290/MBtu <b>8,0/kWh</b>		
└ Set weather dependent						
└ Main						
└ Set weather-dependent heating						
7.7.1.1	[1-00]	Set weather-dependent heating	R/W	Low ambient temp. for LWT main zone heating WD curve. -40~-5°C, step: 1°C <b>-10°C</b>		
7.7.1.1	[1-01]	Set weather-dependent heating	R/W	High ambient temp. for LWT main zone heating WD curve. 10~25°C, step: 1°C <b>15°C</b>		
7.7.1.1	[1-02]	Set weather-dependent heating	R/W	Leaving water value for low ambient temp. for LWT main zone heating WD curve. [9-01]~[9-00]°C, step: 1°C <b>60°C</b>		
7.7.1.1	[1-03]	Set weather-dependent heating	R/W	Leaving water value for high ambient temp. for LWT main zone heating WD curve. [9-01]~min(45,[9-00])°C, step: 1°C <b>35°C</b>		
└ Additional						
└ Set weather-dependent heating						
7.7.2.1	[0-00]	Set weather-dependent heating	R/W	Leaving water value for high ambient temp. for LWT add zone heating WD curve. [9-05]~min(45,[9-06])°C, step: 1°C <b>35°C</b>		
7.7.2.1	[0-01]	Set weather-dependent heating	R/W	Leaving water value for low ambient temp. for LWT add zone heating WD curve. [9-05]~[9-06]°C, step: 1°C <b>60°C</b>		
7.7.2.1	[0-02]	Set weather-dependent heating	R/W	High ambient temp. for LWT add zone heating WD curve. 10~25°C, step: 1°C <b>15°C</b>		
7.7.2.1	[0-03]	Set weather-dependent heating	R/W	Low ambient temp. for LWT add zone heating WD curve. -40~-5°C, step: 1°C <b>-10°C</b>		
Installer settings						
└ System layout						
└ Standard						
A.2.1.1	[E-00]	Unit type	R/O	0~5 <b>3: Hybrid</b>		
A.2.1.2	[E-01]	Compressor type	R/O	<b>0: 08</b>		
A.2.1.3	[E-02]	Indoor software type	R/O	<b>1: Type 2</b>		
A.2.1.6	[D-01]	Forced off contact	R/W	<b>0: No</b> 1: Open tariff 2: Closed tariff 3: Thermostat		
A.2.1.7	[C-07]	Unit control method	R/W	0: LWT control 1: Ext RT control <b>2: RT control</b>		
A.2.1.8	[7-02]	Number of LWT zones	R/W	<b>0: 1 LWT zone</b> 1: 2 LWT zones		
A.2.1.9	[F-0D]	Pump operation mode	R/W	0: Continuous 1: Sample <b>2: Request</b>		
A.2.1.B		User interface location	R/W	0: At unit <b>1: In room</b>		
└ Options						
A.2.2.1	[E-05]	DHW operation	R/W	0: No <b>1: Yes</b>		
A.2.2.2	[E-06]	DHW tank	R/W	<b>0: No</b> 1: Yes		
A.2.2.3	[E-07]	DHW tank type	R/W	0~6 <b>4: Type 5</b> 6: Type 7		
A.2.2.4	[C-05]	Contact type main	R/W	1: Thermo ON/OFF <b>2: C/H request</b>		
A.2.2.5	[C-06]	Contact type add.	R/W	1: Thermo ON/OFF <b>2: C/H request</b>		
A.2.2.6.2	[D-07]	Digital I/O PCB	R/W	<b>0: No</b> 1: Yes		
A.2.2.6.3	[C-09]	Digital I/O PCB	R/W	<b>0: Normally open</b> 1: Normally closed		
A.2.2.7	[D-04]	Demand PCB	R/O	<b>0: No</b>		
A.2.2.8	[D-08]	External kWh meter 1	R/O	<b>0: No</b> 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		

Field settings table					Installer setting at variance with default value		
Breadcrumb	Field code	Setting name		Range, step	Default value	Date	Value
A.2.2.A	[D-02]	DHW pump		R/W	0: No 1: Secondary rtm 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		
A.2.2.C	[D-0A]	External gas meter		R/O	0: Not present 1: 1 /m³ 2: 10 /m³ 3: 100 /m³		
└ 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	37~80°C, step: 1°C 80°C		
A.3.1.1.5	[8-05]	Modulated LWT		R/W	0: No 1: Yes		
A.3.1.1.6.1	[F-0B]	Shut-off valve	Thermo On/OFF	R/W	0: No 1: Yes		
A.3.1.1.7	[9-0B]	Emitter type		R/W	0: Quick 1: Slow		
└└└ Additional							
A.3.1.2.1		LWT setpoint mode		R/W	0: Fixed 1: Weather dep. 2: Fixed / scheduled 3: WD / scheduled		
A.3.1.2.2.1	[9-05]	Temperature range	Minimum temp (heating)	R/W	15~37°C, step: 1°C 25°C		
A.3.1.2.2.2	[9-06]	Temperature range	Maximum temp (heating)	R/W	37~80°C, step: 1°C 80°C		
└ Room thermostat							
A.3.2.1.1	[3-07]	Room temp. range	Minimum temp (heating)	R/W	12~18°C, step: A.3.2.4 12°C		
A.3.2.1.2	[3-06]	Room temp. range	Maximum temp (heating)	R/W	18~30°C, step: A.3.2.4 30°C		
A.3.2.2	[2-0A]	Room temp. offset		R/W	-5~5°C, step: 0,5°C 0°C		
A.3.2.3	[2-09]	Ext. room sensor offset		R/W	-5~5°C, step: 0,5°C 0°C		
A.3.2.4		Room temp. step		R/W	0: 1°C 1: 0,5°C		
└ Operation range							
A.3.3.1	[4-02]	Space heating OFF temp		R/W	14~35°C, step: 1°C 25°C		
└ Domestic hot water (DHW)							
└└ Type							
A.4.1	[6-0D]			R/W	0: Reheat only 1: Reheat + sched. 2: Scheduled only		
└ Disinfection							
A.4.4.1	[2-01]	Disinfection		R/W	0: No 1: Yes		
A.4.4.2	[2-00]	Operation day		R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday 5: Friday 6: Saturday 7: Sunday		
A.4.4.3	[2-02]	Start time		R/W	0~23 hour, step: 1 hour 23		
A.4.4.4	[2-03]	Temperature target		R/W	fixed value 60°C		
A.4.4.5	[2-04]	Duration		R/W	40~60 min, step: 5 min 40 min		
└ Maximum setpoint							
A.4.5	[6-0E]			R/W	[E-06]=1 [E-07] ≠ 6: 40~75°C, step: 1°C, 75°C [E-07] = 6: 40~60°C, step: 1°C, 60°C [E-06]=0 40~65°C, step: 1°C, 65°C		
└ SP mode							
A.4.6				R/W	0: Fixed 1: Weather dep.		
└ Weather dependent curve							
A.4.7	[0-0B]	Weather-dependent curve	DHW setpoint for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C 55°C		
A.4.7	[0-0C]	Weather-dependent curve	DHW setpoint for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C 60°C		
A.4.7	[0-0D]	Weather-dependent curve	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C 15°C		
A.4.7	[0-0E]	Weather-dependent curve	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C -10°C		
└ Heat sources							
└└ Boiler							
A.5.2.2	[5-01]	Equilibrium temp.		R/W	-15~35°C, step: 1°C 5°C		
└ System operation							
└└ Auto restart							
A.6.1	[3-00]			R/W	0: No 1: Yes		
└ Averaging time							

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step Default value	Date	Value
A.6.4	[1-0A]		R/W	0: No averaging 1: <b>12 hours</b> 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 <b>0°C</b>		
		└ Savings mode				
A.6.7	[7-04]		R/W	0: <b>Economical</b> 1: Ecological		
		└ Emergency				
A.6.C			R/W	0: <b>Manual</b> 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 <b>35°C</b>		
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 <b>60°C</b>		
A.8	[0-02]	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C <b>15°C</b>		
A.8	[0-03]	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C <b>-10°C</b>		
A.8	[0-04]	--		<b>8</b>		
A.8	[0-05]	--		<b>12</b>		
A.8	[0-06]	--		<b>35</b>		
A.8	[0-07]	--		<b>20</b>		
A.8	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]*°C, step: 1°C <b>55°C</b>		
A.8	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]*°C, step: 1°C <b>60°C</b>		
A.8	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C <b>15°C</b>		
A.8	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C <b>-10°C</b>		
A.8	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C <b>-10°C</b>		
A.8	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C <b>15°C</b>		
A.8	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00]*°C, step: 1°C <b>60°C</b>		
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 <b>35°C</b>		
A.8	[1-04]	--		<b>1</b>		
A.8	[1-05]	--		<b>1</b>		
A.8	[1-06]	--		<b>20</b>		
A.8	[1-07]	--		<b>35</b>		
A.8	[1-08]	--		<b>22</b>		
A.8	[1-09]	--		<b>18</b>		
A.8	[1-0A]	What is the averaging time for the outdoor temp?	R/W	0: No averaging 1: <b>12 hours</b> 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: <b>Friday</b> 6: Saturday 7: Sunday		
A.8	[2-01]	Should the disinfection function be executed?	R/W	0: <b>No</b> 1: Yes		
A.8	[2-02]	When should the disinfection function start?	R/W	0~23 hour, step: 1 hour <b>23</b>		
A.8	[2-03]	What is the disinfection target temperature?	R/W	fixed value <b>60°C</b>		
A.8	[2-04]	How long must the tank temperature be maintained?	R/W	40~60 min, step: 5 min <b>40 min</b>		
A.8	[2-05]	Room antifrost temperature	R/W	4~16°C, step: 1°C <b>8°C</b>		
A.8	[2-06]	Room frost protection	R/W	0: Disabled 1: <b>Enabled</b>		
A.8	[2-09]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C <b>0°C</b>		
A.8	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C <b>0°C</b>		
A.8	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C <b>0°C</b>		
A.8	[3-00]	Is auto restart of the unit allowed?	R/W	0: No 1: <b>Yes</b>		
A.8	[3-01]	--		<b>0</b>		
A.8	[3-02]	--		<b>1</b>		
A.8	[3-03]	--		<b>4</b>		
A.8	[3-04]	--		<b>2</b>		
A.8	[3-05]	--		<b>1</b>		
A.8	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: A.3.2.4 <b>30°C</b>		
A.8	[3-07]	What is the minimum desired room temperature in heating?	R/W	12~18°C, step: A.3.2.4 <b>12°C</b>		
A.8	[3-08]	--		<b>35</b>		
A.8	[3-09]	--		<b>15</b>		
A.8	[4-00]	--		<b>1</b>		
A.8	[4-01]	--		<b>0</b>		
A.8	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~35°C, step: 1°C <b>25°C</b>		
A.8	[4-03]	--		<b>3</b>		
A.8	[4-04]	--		<b>1</b>		
A.8	[4-05]	--		<b>0</b>		
A.8	[4-06]	-- (Do not change this value)		<b>0/1</b>		
A.8	[4-07]	--		<b>1</b>		
A.8	[4-08]	--		<b>0</b>		
A.8	[4-09]	--		<b>1</b>		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step Default value	Date	Value
A.8	[4-0A]	--		0		
A.8	[4-0B]	--		1		
A.8	[4-0C]	--		35		
A.8	[4-0D]	--		3		
A.8	[4-0E]	Is the installer on site?	R/W	0: No 1: <b>Yes</b>		
A.8	[5-00]	--		0		
A.8	[5-01]	What is the equilibrium temperature for the building?	R/W	-15~35°C, step: 1°C 5°C		
A.8	[5-02]	--		0		
A.8	[5-03]	--		0		
A.8	[5-04]	--		10		
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]	--		1		
A.8	[5-0E]	--		0		
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]	--		0		
A.8	[6-03]	--		0		
A.8	[6-04]	--		0		
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	2~20°C, step: 1°C 5°C		
A.8	[6-09]	--		0		
A.8	[6-0A]	What is the desired comfort storage temperature?	R/W	30~[6-0E]°C, step: 1°C 60°C		
A.8	[6-0B]	What is the desired eco storage temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C 50°C		
A.8	[6-0C]	What is the desired reheat temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C 50°C		
A.8	[6-0D]	What is the desired DHW production type?	R/W	0: Reheat only 1: Reheat + sched. 2: <b>Scheduled only</b>		
A.8	[6-0E]	What is the maximum temperature setpoint?	R/W	[E-06]=1 [E-07] ≠ 6: 40~75°C, step: 1°C, <b>75°C</b> [E-07] = 6: 40~60°C, step: 1°C, <b>60°C</b> [E-06]=0 40~65°C, step: 1°C, <b>65°C</b>		
A.8	[7-00]	--		0		
A.8	[7-01]	--		2		
A.8	[7-02]	How many leaving water temperature zones are there?	R/W	0: <b>1 LWT zone</b> 1: 2 LWT zones		
A.8	[7-03]	PE factor	R/W	0~6, step: 0,1 2,5		
A.8	[7-04]	Savings mode	R/W	0: <b>Economical</b> 1: Ecological		
A.8	[7-05]	--		0		
A.8	[8-00]	--		1		
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 1,5 hour		
A.8	[8-03]	--		50		
A.8	[8-04]	--		0		
A.8	[8-05]	Allow modulation of the LWT to control the room temp?	R/W	0: No 1: <b>Yes</b>		
A.8	[8-06]	Leaving water temperature maximum modulation.	R/W	0~10°C, step: 1°C 5°C		
A.8	[8-07]	--		18		
A.8	[8-08]	--		20		
A.8	[8-09]	What is the desired comfort main LWT in heating?	R/W	[9-01]~[9-00]°C, step: 1°C 45°C		
A.8	[8-0A]	What is the desired eco main LWT in heating?	R/W	[9-01]~[9-00]°C, step: 1°C 40°C		
A.8	[8-0B]	Target flow rate during HP mode	R/W	10~20, step: 0,5 CHYHBO5: <b>13</b> CHYHBO8: <b>15</b>		
A.8	[8-0C]	Target flow rate during hybrid mode	R/W	10~20, step: 0,5 CHYHBO5: <b>13</b> CHYHBO8: <b>15</b>		
A.8	[8-0D]	Target flow rate during boiler mode	R/W	10~20, step: 0,5 16		
A.8	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	37~80°C, step: 1°C 80°C		
A.8	[9-01]	What is the minimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C 25°C		
A.8	[9-02]	--		22		
A.8	[9-03]	--		5		
A.8	[9-04]	--		1		
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	37~80°C, step: 1°C 80°C		
A.8	[9-07]	--		5		
A.8	[9-08]	--		22		
A.8	[9-09]	--		5		
A.8	[9-0A]	--		5		
A.8	[9-0B]	What emitter type is connected to the main LWT zone?	R/W	0: <b>Quick</b> 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 6		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step Default value	Date	Value
A.8	[9-0E]	--		0~8,step:1 <b>6</b>		
A.8	[A-00]	--		<b>0</b>		
A.8	[A-01]	--		<b>0</b>		
A.8	[A-02]	--		<b>0</b>		
A.8	[A-03]	--		<b>0</b>		
A.8	[A-04]	--		<b>0</b>		
A.8	[B-00]	--		<b>0</b>		
A.8	[B-01]	--		<b>0</b>		
A.8	[B-02]	--		<b>0</b>		
A.8	[B-03]	--		<b>0</b>		
A.8	[B-04]	--		<b>0</b>		
A.8	[C-00]	Domestic heating water priority.	R/W	<b>0: Solar priority</b> 1: Heat pump priority		
A.8	[C-01]	--		<b>0</b>		
A.8	[C-02]	--		<b>0</b>		
A.8	[C-03]	--		<b>0</b>		
A.8	[C-04]	--		<b>3</b>		
A.8	[C-05]	What is the thermo request contact type for the main zone?	R/W	1: Thermo ON/OFF <b>2: C/H request</b>		
A.8	[C-06]	What is the thermo request contact type for the add. zone?	R/W	0: - 1: Thermo ON/OFF <b>2: C/H request</b>		
A.8	[C-07]	What is the unit control method in space operation?	R/W	0: LWT control 1: Ext RT control <b>2: RT control</b>		
A.8	[C-08]	Which type of external sensor is installed?	R/W	<b>0: No</b> 1: Outdoor sensor 2: Room sensor		
A.8	[C-09]	What is the required alarm output contact type?	R/W	<b>0: Normally open</b> 1: Normally closed		
A.8	[C-0A]	Indoor quick heat-up function	R/W	<b>0: Disable</b> 1: Enable		
A.8	[C-0C]	High electricity price decimal (Do not use)	R/W	0~7 <b>4</b>		
A.8	[C-0D]	Medium electricity price decimal (Do not use)	R/W	0~7 <b>4</b>		
A.8	[C-0E]	Low electricity price decimal (Do not use)	R/W	0~7 <b>4</b>		
A.8	[D-00]	--		<b>0</b>		
A.8	[D-01]	Forced off contact	R/W	<b>0: No</b> 1: Open tariff 2: Closed tariff 3: Thermostat		
A.8	[D-02]	Which type of DHW pump is installed?	R/W	<b>0: No</b> 1: Secondary rtn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.8	[D-03]	Leaving water temperature compensation around 0°C.	R/W	<b>0: Disabled</b> 1: Enabled, shift 2°C (from -2 to 2°C) 2: Enabled, shift 4°C (from -2 to 2°C) 3: Enabled, shift 2°C (from -4 to 4°C) 4: Enabled, shift 4°C (from -4 to 4°C)		
A.8	[D-04]	Is a demand PCB connected?	R/O	<b>0: No</b> 1: Pwr consmp ctrl		
A.8	[D-05]	--		<b>1</b>		
A.8	[D-07]	Is a solar kit connected?	R/W	<b>0: No</b> 1: Yes		
A.8	[D-08]	Is an external kWh meter used for power measurement?	R/O	<b>0: No</b> 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]	--		<b>0</b>		
A.8	[D-0A]	Is an external gas meter used for power measurement?	R/O	<b>0: Not present</b> 1: 1 /m³ 2: 10 /m³ 3: 100 /m³		
A.8	[D-0B]	--		<b>2</b>		
A.8	[D-0C]	What is the high electricity price (Do not use)	R/W	0~49 <b>20</b>		
A.8	[D-0D]	What is the medium electricity price (Do not use)	R/W	0~49 <b>20</b>		
A.8	[D-0E]	What is the low electricity price (Do not use)	R/W	0~49 <b>15</b>		
A.8	[E-00]	Which type of unit is installed?	R/O	0~5 <b>3: Hybrid</b>		
A.8	[E-01]	Which type of compressor is installed?	R/O	<b>0: 08</b>		
A.8	[E-02]	What is the indoor unit software type?	R/O	<b>1: Type 2</b>		
A.8	[E-03]	--		<b>0</b>		
A.8	[E-04]	--	R/O	<b>0</b>		
A.8	[E-05]	Can the system prepare domestic hot water?	R/W	0: No <b>1: Yes</b>		
A.8	[E-06]	Is a DHW tank installed in the system?	R/W	<b>0: No</b> 1: Yes		
A.8	[E-07]	What kind of DHW tank is installed?	R/W	<b>0~6</b> <b>4: Type 5</b> 6: Type 7		
A.8	[E-08]	--		<b>0</b>		
A.8	[E-09]	--		<b>0</b>		
A.8	[E-0A]	--		<b>0</b>		
A.8	[E-0B]	--		<b>0</b>		
A.8	[E-0C]	--		<b>0</b>		
A.8	[F-00]	--		<b>0</b>		
A.8	[F-02]	--		<b>3</b>		
A.8	[F-03]	--		<b>5</b>		
A.8	[F-04]	--		<b>0</b>		
A.8	[F-05]	--		<b>0</b>		
A.8	[F-06]	--		<b>0</b>		
A.8	[F-09]	--		<b>0</b>		
A.8	[F-0A]	--		<b>0</b>		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step Default value	Date	Value
A.8	[F-0B]	Close shut-off valve during thermo OFF?	R/W	0: No 1: Yes		
A.8	[F-0C]	--	R/W	1		
A.8	[F-0D]	What is the pump operation mode?	R/W	0: Continuous 1: Sample 2: Request		



