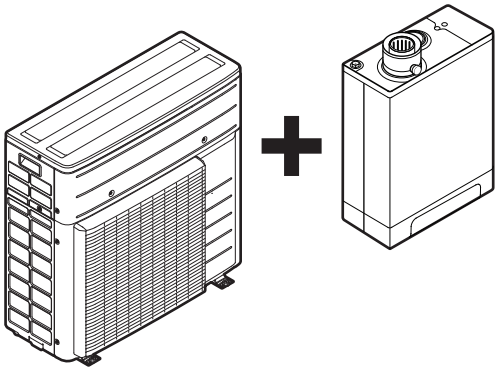
Installer reference guide

Daikin Altherma H Hybrid



EJHA04AAV3
NHY2KOMB28AA
NHY2KOMB32AA

Installer reference guide
Daikin Altherma H Hybrid

English

Table of contents

1 General safety precautions

1.1 About the documentation

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

1.1.1 Meaning of warnings and symbols

DANGER

Indicates a situation that results in death or serious injury.

DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.

DANGER: RISK OF BURNING

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

DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.

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.

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

1.2 For the installer

1.2.1 General

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

NOTICE

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

WARNING

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

CAUTION

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

WARNING

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

DANGER: RISK OF BURNING

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

WARNING

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

CAUTION

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

NOTICE

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

NOTICE

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

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

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

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

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

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).

1.2.2 Installation site

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

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°C.

1.2.3 Refrigerant

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

NOTICE

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

NOTICE

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

WARNING

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

WARNING

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

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

DANGER: RISK OF EXPLOSION

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

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

WARNING

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

NOTICE

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

NOTICE

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

WARNING

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

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

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

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

CAUTION

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

1.2.4 Brine

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

WARNING

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

WARNING

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

WARNING

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

WARNING

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

1.2.5 Water

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

NOTICE

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

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.

1.2.6 Electrical

DANGER: RISK OF ELECTROCUTION

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

WARNING

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

WARNING

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

CAUTION

When connecting the power supply, the earth connection must be made before the current-carrying connections are established. When disconnecting the power supply, the current-carrying connections must be separated before the earth connection is. 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 metre away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 metre may not be sufficient.

WARNING

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

NOTICE

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

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

1.2.7 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.

1.2.8 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.

1.2.9 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.

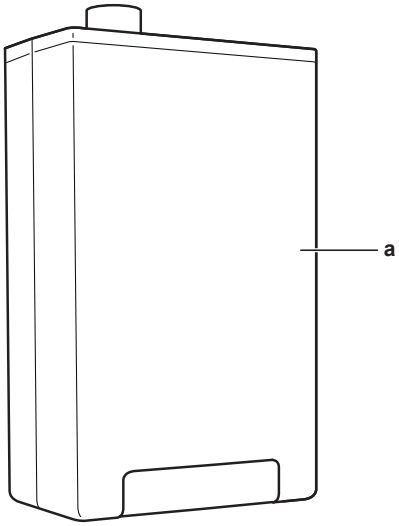
2 About the product

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.



a Gas boiler module

INFORMATION

This product is intended for domestic use only.

3 About the documentation

3.1 About this document

INFORMATION

This appliance is not intended for use by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

Target audience

Authorised installers

Documentation set

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

- **General safety precautions:**
  - Safety instructions that you must read before installing
  - Format: Paper (in the box of the outdoor unit)
- **Operation manual:**
  - Quick guide for basic usage
  - Format: Paper (in the box of the outdoor unit)
- **User reference guide:**
  - Detailed step-by-step instructions and background information for basic and advanced usage
  - Format: Digital files on http://www.daikineurope.com/support-and-manuals/product-information/
- **Installation manual – Heat pump module:**
  - Installation instructions
  - Format: Paper (in the box of the outdoor unit)
- **Installation and operation manual – Gas boiler module:**
  - Installation and operation instructions
  - Format: Paper (in the box of the gas boiler)
- **Installer reference guide:**
  - Preparation of the installation, good practices, reference data,…
  - Format: Digital files on http://www.daikineurope.com/support-and-manuals/product-information/
- **Addendum book for optional equipment:**
  - Additional info about how to install optional equipment
  - Format: Paper (in the box of the outdoor unit) + Digital files on http://www.daikineurope.com/support-and-manuals/product-information/

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

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

Technical engineering data

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

3.2 Installer reference guide at a glance

Chapter	Description
General safety precautions	Safety instructions that you must read before installing
About the product	Required combination of heat pump module and gas boiler module
About the documentation	What documentation exists for the installer
About the box	How to unpack the units and remove their accessories
About the units and options	▪ How to identify the units ▪ Possible combinations of units and options
Preparation	What to do and know before going on-site

Chapter	Description
Installation	What to do and know to install the system
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
Glossary	Definition of terms
Field settings table	Table to be filled in by the installer, and kept for future reference **Note:** There is also an installer settings table in the user reference guide. This table has to be filled in by the installer and handed over to the user.

4 About the box

4.1 Overview: About the box

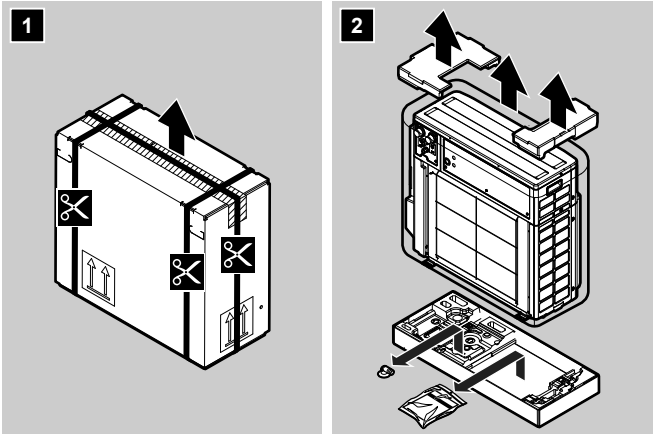
This chapter describes what you have to do after the boxes with the outdoor unit and the gas boiler are delivered on-site.

Keep the following in mind:

- At delivery, the unit MUST be checked for damage. Any damage 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 the path along which you want to bring the unit inside in advance.

4.2 Outdoor unit

4.2.1 To unpack the outdoor unit



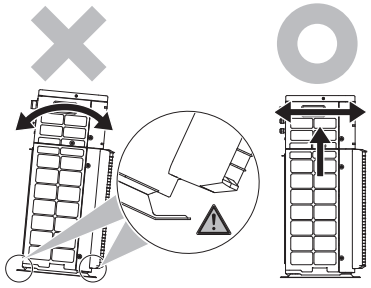
4.2.2 To handle the outdoor unit

CAUTION

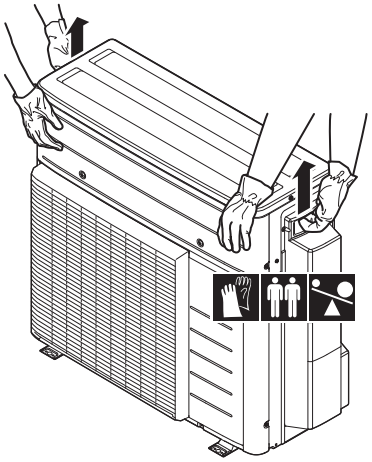
To avoid injury, do NOT touch the air inlet or aluminium fins of the unit.

NOTICE

To prevent damage to the supporting feet, do NOT tilt the unit sideways in any way:



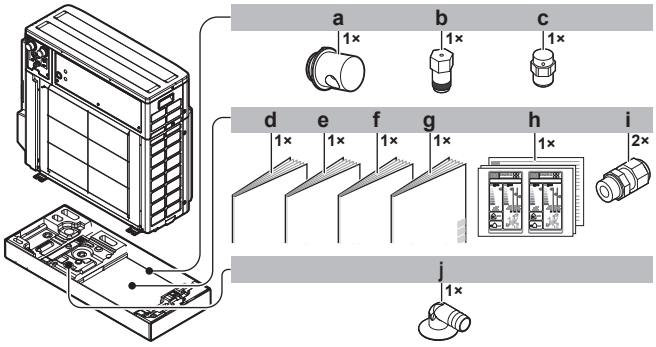
Carry the unit slowly as shown:



4.2.3 To remove the accessories from the outdoor unit

1 Lift the outdoor unit. See "4.2.2 To handle the outdoor unit" on page 9.

2 Remove the accessories at the bottom of the package.

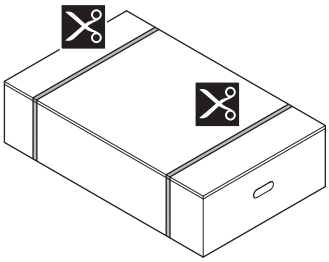


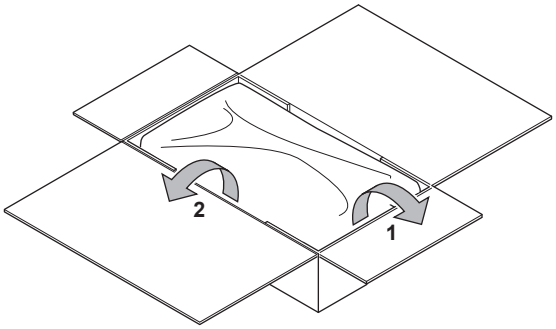
a Connection piece (with O-ring) for freeze protection valve inside the outdoor unit
b Freeze protection valve (for inside the outdoor unit)
c Vacuum breaker (for outside the outdoor unit)
d General safety precautions
e Addendum book for optional equipment
f Outdoor unit installation manual
g Operation manual
h Energy label
i Cable gland
j Drain plug

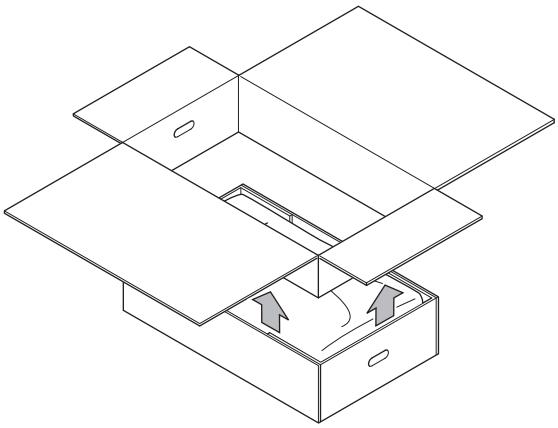
4.3 Gas boiler

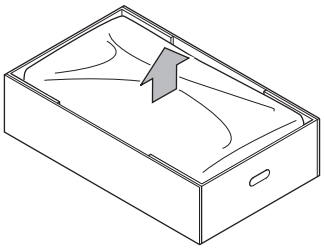
4.3.1 To unpack the gas boiler

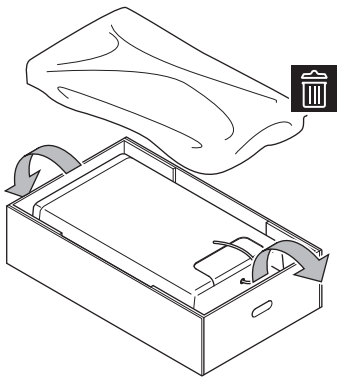
Before unpacking, move the gas boiler as close as possible to its installation position.

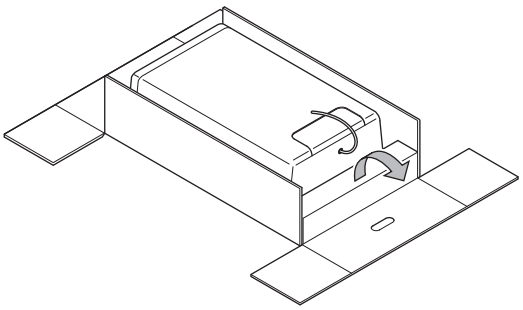










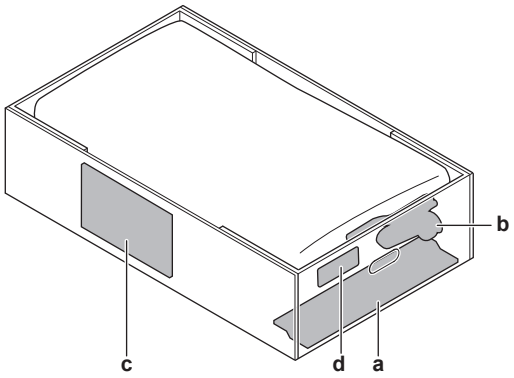


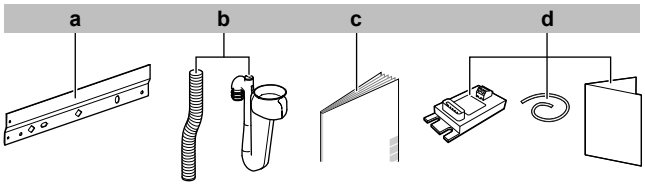
WARNING

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

4.3.2 To remove the accessories from the gas boiler

1 Remove the accessories.





a Mounting strip
b Condensate trap
c Installation and operation manual
d Current loop module, cable and installation manual

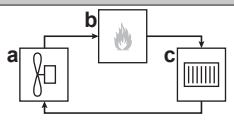
5 About the system

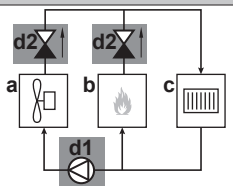
5.1 Possible system layouts

INFORMATION

This topic contains basic information about the possible system layouts. For more information, see the "Application guidelines" chapter.

The system layout differs depending on the gas boiler. You can combine the outdoor unit (=EJHA04AAV3) with:

Gas boiler	System layout
Dedicated gas boiler (=NHY2KOMB28+32AA)	

Gas boiler	System layout
Third-party gas boiler	

a Outdoor unit
b Gas boiler
c Space heating circuit
d1+d2 Parts of mandatory options EKADDONJH and EKADDONJH2 (= connection kit for third-party gas boiler):
d1: External pump (EKADDONJH)
d2: Non-return valve (EKADDONJH2)

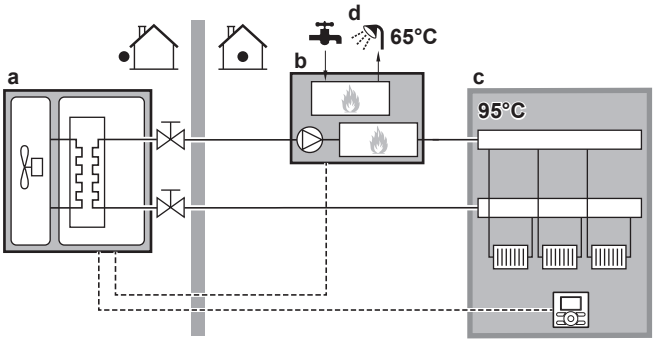
5.1.1 Dedicated gas boiler

The dedicated gas boiler (=NHY2KOMB28+32AA) is recommended for new installations.

Using this gas boiler, you can produce domestic hot water as follows:

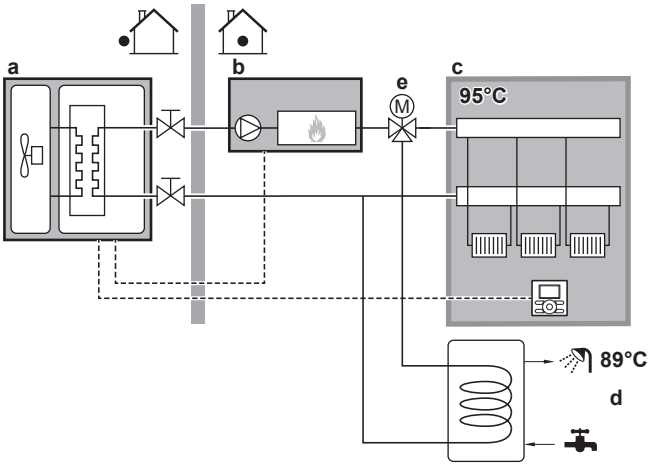
- Domestic hot water by tank
- Instant domestic hot water by gas boiler

Dedicated gas boiler + Instant domestic hot water



a Outdoor unit
b Gas boiler
c Space heating circuit
d Instant domestic hot water

Dedicated gas boiler + Domestic hot water via tank



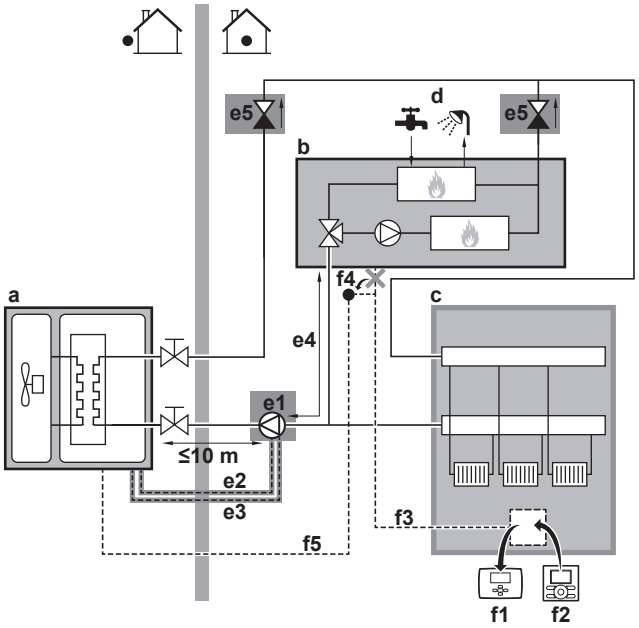
a Outdoor unit
b Gas boiler
c Space heating circuit
d Domestic hot water via tank
e Motorised 3-way valve

5.1.2 Third-party gas boiler

For existing installations, you do not need to buy a new gas boiler. You can reuse the existing gas boiler, and the wiring of the old thermostat.

Using this gas boiler, you can only produce domestic hot water as instant domestic hot water by gas boiler.

Third-party gas boiler + Instant domestic hot water



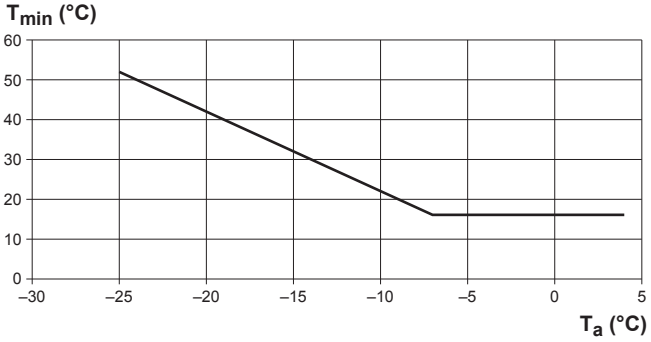
a Outdoor unit
b Gas boiler
c Space heating circuit
d Instant domestic hot water
e1~e5 Parts of mandatory options EKADDONJH and EKADDONJH2 (= connection kit for third-party gas boiler). For installation instructions, see the installation manual of the connection kit.
e1: External pump (EKADDONJH)
e2: External pump cable – Power supply (EKADDONJH2)
e3: External pump cable – Pulse-width modulation (PWM) signal (EKADDONJH2)
e4: Distance between external pump and gas boiler must be as short as possible
e5: Non-return valve (EKADDONJH2)
f1~f5 Connection of user interface (you can reuse old wiring):
f1: Remove old thermostat
f2: Install new user interface
f3: Reuse old wiring
f4: Disconnect old wiring from the gas boiler, and connect it to new wiring
f5: Connect new wiring to the outdoor unit

Third-party gas boiler + Domestic hot water via tank

Not possible.

Setpoint of the third-party gas boiler

To prevent freeze-up of the water piping, the third-party gas boiler must have a fixed setpoint ≥55°C, or a weather-dependent setpoint ≥T_{min}.



T_a Outdoor temperature
T_{min} Minimum weather-dependent setpoint for third-party gas boiler

5.2 Freeze protection

You must protect the system against freezing. This involves:

- Choosing between glycol and freeze protection valves
- Installing the bottom plate heater

5.2.1 Glycol or freeze protection valves

Frost can damage the system. To prevent the hydraulic components from freezing, the software is equipped with special frost protection functions, that include the activation of pump in case of low temperatures.

However, in case of a power failure, these functions cannot guarantee protection.

Do one of the following to protect the water circuit against freezing:

- Add glycol to the water. Glycol lowers the freezing point of the water.
- Install freeze protection valves. Freeze protection valves drain the water from the system before it can freeze.

NOTICE

If you add glycol to the water, do NOT install freeze protection valves. **Possible consequence:** Glycol leaking out of the freeze protection valves.

INFORMATION

For more information about glycol and freeze protection valves, see "9.6.5 To protect the water circuit against freezing" on page 37.

5.2.2 Bottom plate heater

To prevent freeze-up of the bottom plate you can install the optional bottom plate heater. In certain circumstances this is required.

Bottom plate heater (EKBPHT04JH)

- Prevents freeze-up of the bottom plate.
- Required in areas with ambient temperature <–5°C and high relative humidity for at least 3 consecutive days.
- For installation instructions, see the installation manual of the bottom plate heater.

NOTICE

- If you install the bottom plate heater, you may lower the operation range of the heat pump to Ta≥–14°C using field setting [8-0E]=–14°C.
- If you do not install the bottom plate heater, keep [8-0E]=–5°C.

6 About the units and options

6.1 Overview: About the units and options

This chapter contains information about:

- Identifying the outdoor unit
- Identifying the gas boiler
- Combining outdoor unit and gas boiler
- Combining the outdoor unit with options
- Combining the gas boiler with options

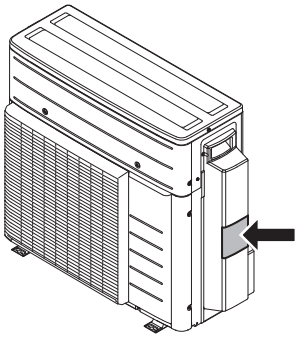
6.2 Identification

NOTICE

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

6.2.1 Identification label: Outdoor unit

Location



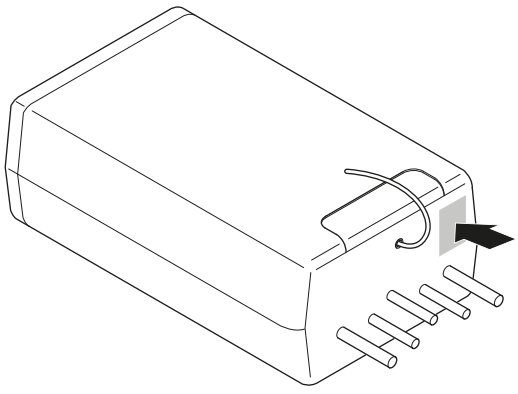
Model identification

Example: EJ H A 04 AA V3

Code	Explanation
EJ	Hybrid monobloc outdoor pair heating only
H	Low water temperature – ambient zone 3 (see operation range)
A	Refrigerant R32
04	Capacity class
AA	Model series
V3	Power supply

6.2.2 Identification label: Gas boiler

Location



Model identification

Unit detail	Description
******-yymm******	Product code-Serial No. yy = year of production, mm = month of production
PIN	Product Identification Number
	Data related to domestic hot water
	Data related to space heating

Unit detail	Description
↯	Information regarding electrical power supply (Voltage, mains frequency, elmax, IP-class)
PMS	Permissible overpressure in space heating circuit
PWS	Permissible overpressure in domestic hot water circuit
Qn HS	Input related to gross caloric value in kilowatts
Qn Hi	Input related to net caloric value in kilowatts
Pn	Output in kilowatts

Unit detail	Description
DE, FR, GB, IT, NL	Countries of Destination (EN 437)
I2E(s), I2H, IIELL3P, II2H3P, II2Esi3P	Approved unit categories (EN 437)
G20-20 mbar G25-25 mbar	Gas group and gas connection pressure as set at the factory (EN 437)
B23, …., C93(x)	Approved flue gas category (EN 15502)
Tmax	Maximum flow temperature in °C
IPX4D	Electrical protection class

6.3 Combining units and options

6.3.1 Possible combinations of outdoor unit, gas boiler and domestic hot water tank

System			Remark	
Outdoor unit	Gas boiler	DHW tank	DHW	Space heating
EJHA04AAV3	NHY2KOMB28AA NHY2KOMB32AA	EKHWS*D*	Domestic hot water by tank. Tank heated: ▪ By outdoor unit only, or ▪ By gas boiler only(a)	▪ By outdoor unit only, or ▪ By gas boiler only, or ▪ By combination of outdoor unit and gas boiler
		EKHWP		
		Third-party(b)		
		—	Instant domestic hot water by gas boiler	▪ By outdoor unit only, or ▪ By gas boiler only, or ▪ By combination of outdoor unit and gas boiler
	Third-party	—	Instant domestic hot water by gas boiler	▪ By outdoor unit only, or ▪ By gas boiler only (bivalent operation)

(a) Maximum tank set point is 60°C
(b) Third-party tank is possible, but comfort cannot be guaranteed. See the minimum requirements for third-party tanks in "8.3.2 Water circuit requirements" on page 27.

6.3.2 Possible options for the outdoor unit

User interface (EKRUHML*)

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

Following user interfaces are available:

- EKRUHML1 contains the following languages: English, French, Dutch, Italian.
- EKRUHML2 contains the following languages: English, German, Dutch, Italian.

For installation instructions, see "To connect the user interface" on page 43.

Remote outdoor sensor (EKRSCA1)

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

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

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

Heat pump convector (FWXV)

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

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

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

You can install this LAN adapter to:

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

For installation instructions, see the installation manual of the LAN adapter and the addendum book for optional equipment.

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 and the addendum book for optional equipment.

Room thermostat (EKRTWA, EKRTR1)

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

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

Remote sensor for wireless thermostat (EKRTETS)

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

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

Bottom plate heater (EKBPHT04JH)

- Prevents freeze-up of the bottom plate.

- Required in areas with ambient temperature <–5°C and high relative humidity for at least 3 consecutive days.
- For installation instructions, see the installation manual of the bottom plate heater.

Shut-off valves (EKBALLV1)

We recommended to install shut-off valves to the space heating water connections of the outdoor unit. They let you service the outdoor unit without draining the whole system.

One of the two shut-off valves has an integrated connection for the vacuum breaker (if applicable).

For installation instructions, see the installation manual of the shut-off valves.

Connection kit for third-party gas boiler (EKADDONJH +EKADDONJH2)

Required when connecting a third-party gas boiler to the system.

Consists of 2 separate kits that have to be used together:

- EKADDONJH: Contains the external pump
- EKADDONJH2: Contains the 2 non-return valves and 2 cables

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

Domestic hot water tank

Only applicable in case of NHY2KOMB28+32AA gas boiler.

For providing domestic hot water, a domestic hot water tank can be connected to the gas boiler.

The following domestic hot water tanks are available:

Tank	Remark
Stainless steel tank: ▪ EKHWS150D3V3 ▪ EKHWS180D3V3 ▪ EKHWS200D3V3 ▪ EKHWS250D3V3 ▪ EKHWS300D3V3	When using this tank: ▪ Use the tank thermistor from the following option kit: EKTH3 ▪ Use the 3-way valve delivered as accessory with the tank
Polypropylene tank (with drainback solar): ▪ EKHWP300B ▪ EKHWP500B	When using this tank: ▪ Use the tank thermistor from the following option kit: EKTH4 ▪ Use the 3-way valve from the following option kit: EKDVCPLT3HX
Polypropylene tank (with pressurised solar): ▪ EKHWP300PB ▪ EKHWP500PB	
Third-party tank	When using a third-party tank: ▪ Make sure it complies with the minimum requirements. See "6.3.1 Possible combinations of outdoor unit, gas boiler and domestic hot water tank" on page 13. ▪ Use the tank thermistor from the following option kit: EKTH3 ▪ Use the 3-way valve from the following option kit: EKHY3PART

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

Thermistor kit for EKHWS*D* or third-party tank (EKTH3)

Required when connecting one of the following tanks to the system:

- EKHWS*D* tank
- Third-party tank

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

Thermistor kit for EKHWP tank (EKTH4)

Required when connecting a EKHWP tank to the system.

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

Connection kit for third-party tank (EKHY3PART)

Required when connecting a third-party tank to the system.

Contains a thermistor and a 3-way valve. However, only use the 3-way valve from this kit. Do NOT use the thermistor, use the thermistor from the EKTH3 instead.

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

PC cable (EKPCCAB)

The PC cable makes a connection between the switch box of the outdoor unit and a PC. It gives the possibility to update the software of the outdoor unit.

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

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

Freeze protection valves (AFVALVEHY2)

Protects field piping from freezing and bursting.

Includes a vacuum breaker (head-up for air supply) and a freeze protection valve (for water drainage).

For installation instructions, see "9.6.5 To protect the water circuit against freezing" on page 37.

6.3.3 Possible options for the gas boiler

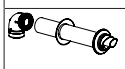
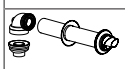
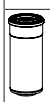
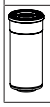
Main options

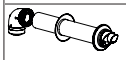
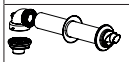
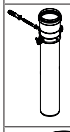
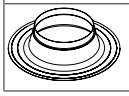
Part	NHY2KOMB28AA	NHY2KOMB32AA
Boiler cover plate		
Cover plate to protect the piping and valves of the gas boiler. For installation instructions, see the installation manual of the cover plate(*).	EKHY093467 EKCP1A	
Gas conversion kit G25		
Kit for the conversion of the gas boiler for use with gas type G25.	EKPS076217	EKPS076227

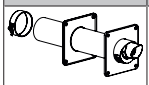
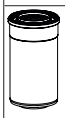
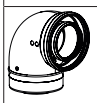
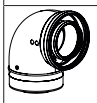
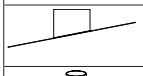
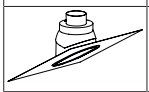
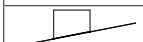
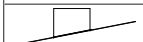
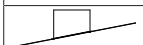
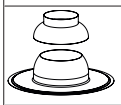
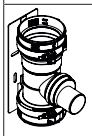
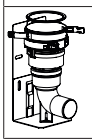
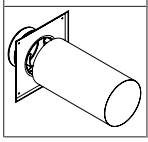
Part	NHY2KOMB28AA	NHY2KOMB32AA
Gas conversion kit G31		
Kit for the conversion of the gas boiler for use with gas type G31	EKHY075867	EKHY075787
Dual pipe conversion kit		
Kit for the conversion of a concentric flue gas system to a dual pipe system. For installation instructions, see the installation manual of the dual pipe conversion kit	EKHY090707	
80/125 concentric connection kit		
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.	EKHY090717	
B-packs		
An integrated solution for expansion vessel to make filling easier. Required installation space is limited(*).	EKFJM1A EKFJM2A EKFJM3A EKFJM6A	EKFJL1A EKFJL2A EKFJL3A EKFJL6A
Valve kit		
To easier connect pipes and valves. For installation instruction, see the manual of the kit.	EKVK4A EKVK6A	
Filling loop set		
To fill and top up the space heating system.	EKFL1A	
Solar water heater connection set		
To combine the boiler with a solar heated tank.	EKSH1A	
Dongle set		
To set up wireless communication between the gas boiler and a computer	EKDS1A	

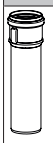
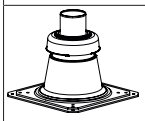
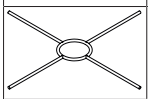
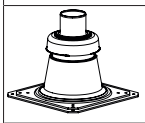
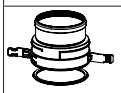
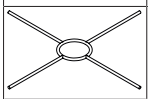
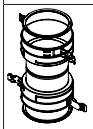
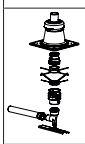
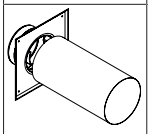
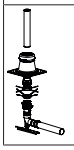
(*) The boiler cover plate cannot be used with B-packs.

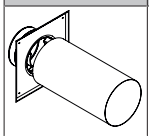
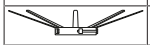
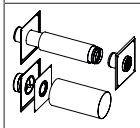
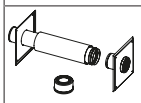
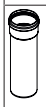
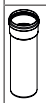
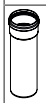
Other options

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 60/100×500 mm
	EKFGP4652	Extension PP/GLV 60/100×1000 mm

Accessories	Part number	Description
	EKFGP4664	Elbow PP/GLV 60/100 30°
	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

Accessories	Part number	Description
	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
	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

Accessories	Part number	Description
	EKFGP5461	Extension PP 60×500
	EKFGP5497	Chimney top PP 100 with included flue pipe
	EKFGP6316	Adapter flex-fixed PP 100
	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

Accessories	Part number	Description
	EKFGP4828	Chimney connection 80/125
	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.

7 Application guidelines

7.1 Overview: Application guidelines

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

NOTICE

- The illustrations in the application guidelines are meant for reference only, and are NOT to be used as detailed hydraulic diagrams. The detailed hydraulic dimensioning and balancing are NOT shown, and are the responsibility of the installer.
- For more information about the configuration settings to optimize heat pump operation, see "10 Configuration" on page 56.

This chapter contains application guidelines for:

- Setting up the space heating system
- Setting up the domestic hot water tank
- Setting up the energy metering
- Setting up the power consumption control
- Setting up an external temperature sensor

7.2 Setting up the space heating system – In case of dedicated gas boiler

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

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

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

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

NOTICE

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

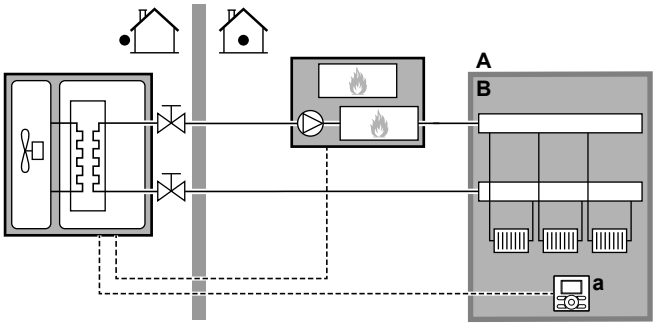
INFORMATION

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

7.2.1 Single room

Underfloor heating or radiators – Wired room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface used as room thermostat

- The outdoor unit is connected in series with the gas boiler.
- The underfloor heating or radiators are directly connected to the gas boiler.
- The room temperature is controlled by the user interface, which is used as room thermostat.

Configuration

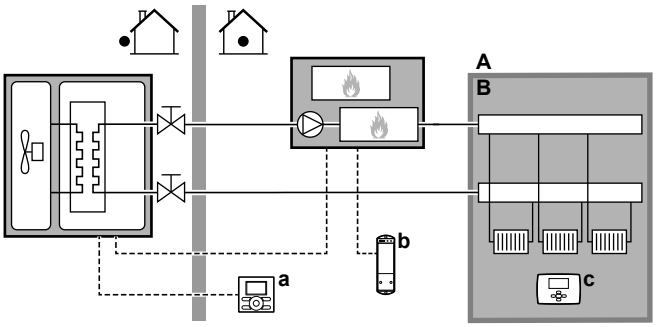
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (`RT control`): Unit operation is decided based on the ambient temperature of the user interface.

Benefits

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

Underfloor heating or radiators – Wireless room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface
b Receiver for wireless external room thermostat
c Wireless external room thermostat

- The outdoor unit is connected in series with the gas boiler.
- The underfloor heating or radiators are directly connected to the gas boiler.
- The room temperature is controlled by the wireless external room thermostat (optional equipment EKRTR1).

Configuration

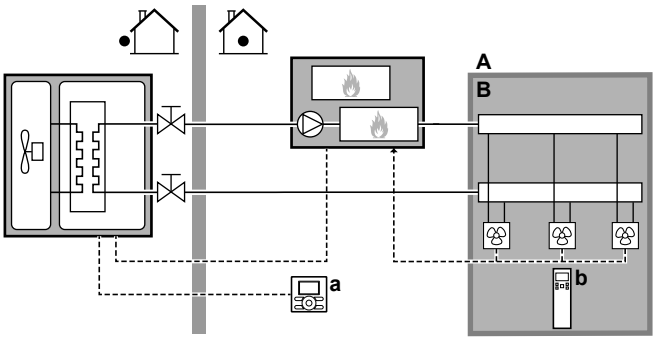
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (`Ext RT control`): Unit operation is decided by the external thermostat.
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (`Thermo ON/OFF`): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **Wireless.** The Daikin external room thermostat is available in a wireless version.
- **Efficiency.** Although the external room thermostat only sends ON/OFF signals, it is specifically designed for the heat pump system.

Heat pump convectors

Setup



A Main leaving water temperature zone
B One single room
a User interface
b Remote controller of the heat pump convectors

- The outdoor unit is connected in series with the gas boiler.
- The heat pump convectors are directly connected to the gas boiler.
- The desired room temperature is set via the remote controller of the heat pump convectors.

- The space heating demand signal is sent to one digital input on the gas boiler (X4/6 and X4/7).

INFORMATION

When using multiple heat pump convectors, make sure each one receives the infrared signal from the remote controller of the heat pump convectors.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (`Ext RT control`): Unit operation is decided by the external thermostat.
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (`Thermo ON/OFF`): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

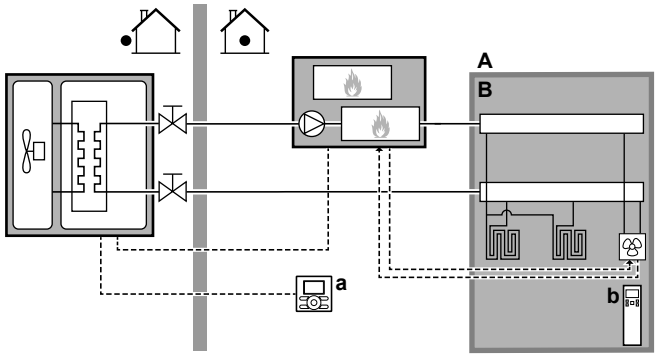
Benefits

- **Efficiency.** Optimal energy efficiency because of the interlink function.
- **Stylish.**

Combination: Underfloor heating + Heat pump convectors

- Space heating is provided by:
  - The underfloor heating
  - The heat pump convectors

Setup



A Main leaving water temperature zone
B One single room
a User interface
b Remote controller of the heat pump convectors

- The outdoor unit is connected in series with the gas boiler.
- The heat pump convectors are directly connected to the gas boiler.
- The desired room temperature is set via the remote controller of the heat pump convectors.
- The space heating demand signal is sent to one digital input on the gas boiler (X4/6 and X4/7).

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (`Ext RT control`): Unit operation is decided by the external thermostat.
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (`Thermo ON/OFF`): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **Efficiency**. Underfloor heating has the best performance with the heat pump system.
- **Comfort.** The combination of the two heat emitter types provides excellent heating comfort of the underfloor heating.

7.2.2 Multiple rooms – One LWT zone

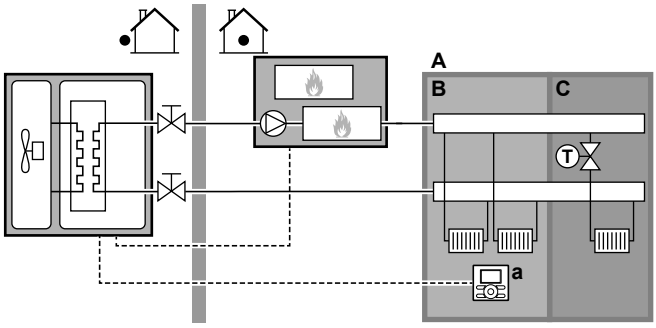
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

Example: If the heat pump system is used to heat up one floor where all the rooms have the same heat emitters.

Underfloor heating or radiators – Thermostatic valves

If you are heating up rooms with underfloor heating or radiators, a very common way is to control the temperature of the main room by using a thermostat (this can either be the user interface or an external room thermostat), while the other rooms are controlled by so-called thermostatic valves, which open or close depending on the room temperature.

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a User interface

- The outdoor unit is connected in series with the gas boiler.
- The underfloor heating of the main room is directly connected to the gas boiler.
- The room temperature of the main room is controlled by the user interface used as thermostat.
- A thermostatic valve is installed before the underfloor heating in each of the other rooms.

INFORMATION

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

Configuration

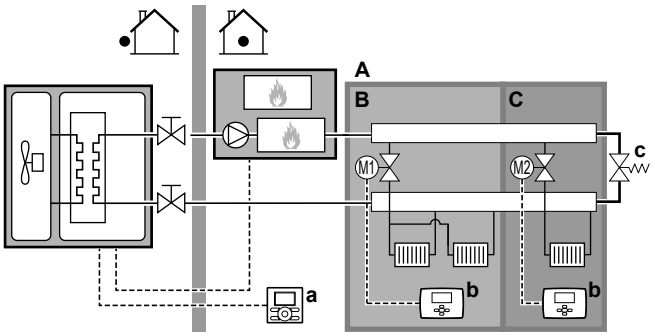
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (`RT control`): Unit operation is decided based on the ambient temperature of the user interface.

Benefits

- **Cost effective.** You do NOT need an additional external room thermostat.
- **Easy**. Same installation as for one room, but with thermostatic valves.

Underfloor heating or radiators – Multiple external room thermostats

Setup



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

- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating demand.
- A bypass valve must be installed to make water recirculation possible when all shut-off valves are closed. To guarantee reliable operation, provide a minimum water flow as described in table "To check the water volume and flow rate" in "8.3 Preparing water piping" on page 26.
- The room thermostats are connected to the shut-off valves, and do NOT have to be connected to the outdoor unit. The outdoor unit will supply leaving water all the time, with the possibility to program a leaving water schedule.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	0 (`LWT control`): Unit operation is decided based on the leaving water temperature.

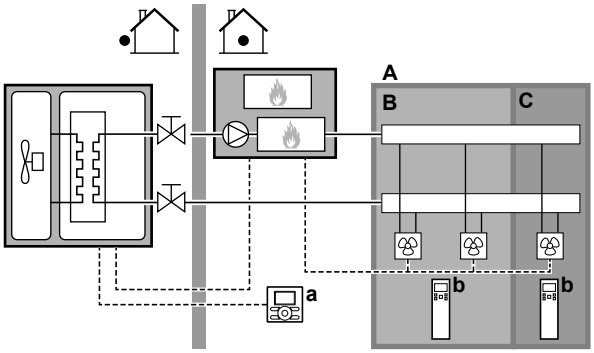
Benefits

Compared with underfloor heating or radiators for one room:

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

Heat pump convectors – Multiple rooms

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a User interface
b Remote controller of the heat pump convectors

- The desired room temperature is set via the remote controller of the heat pump convectors.
- The heating demand signals of each heat pump convector are connected in parallel to the digital input on the gas boiler (X4/6 and X4/7). The outdoor unit will only supply leaving water temperature when there is an actual demand.

INFORMATION

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

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (`Ext RT control`): Unit operation is decided by the external thermostat.

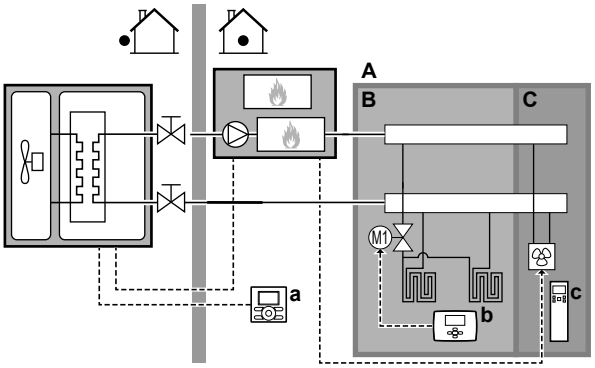
Benefits

Compared with heat pump convectors for one room:

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

Combination: Underfloor heating + Heat pump convectors – Multiple rooms

Setup



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

- The outdoor unit is connected in series with the gas boiler.
- For each room with heat pump convectors: The heat pump convectors are directly connected to the gas boiler.
- For each room with underfloor heating: A shut-off valve (field supply) is installed before the underfloor heating. It prevents hot water supply when the room has no heating demand.
- For each room with heat pump convectors: The desired room temperature is set via the remote controller of the heat pump convectors.
- For each room with underfloor heating: The desired room temperature is set via the external room thermostat (wired or wireless).

INFORMATION

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

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	0 (`LWT control`): Unit operation is decided based on the leaving water temperature.

7.3 Setting up the space heating system – In case of third-party gas boiler

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

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

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

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

NOTICE

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

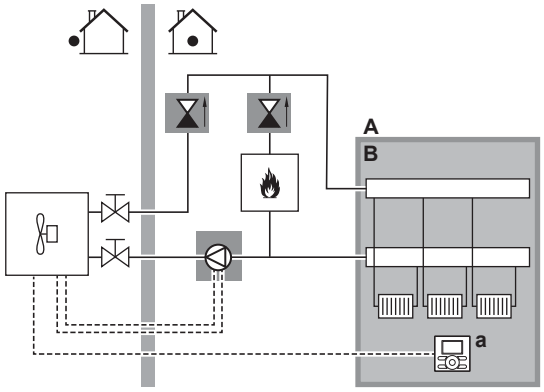
INFORMATION

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

7.3.1 Single room

Under floor heating or radiators – Wired room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface used as room thermostat

- The outdoor unit is connected in parallel with the gas boiler.
- The circuit contains external pump.
- The under floor heating of the main room is connected via 2 non-return valves to the outdoor unit and the gas boiler.
- The room temperature is controlled by the user interface, which is used as room thermostat.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (`RT control`): Unit operation is decided based on the ambient temperature of the user interface.

Benefits

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

7.3.2 Multiple rooms – One LWT zone

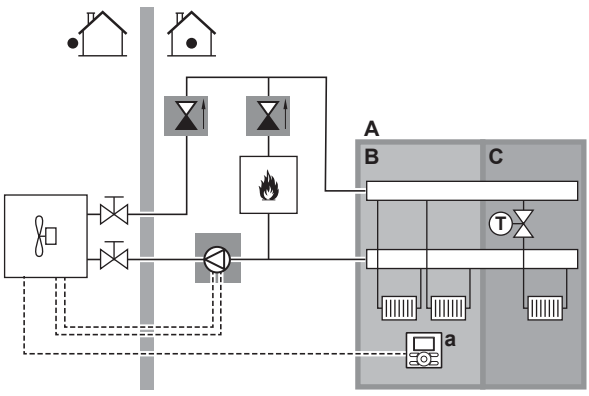
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

Example: If the heat pump system is used to heat up one floor where all the rooms have the same heat emitters.

Under floor heating or radiators – Thermostatic valves

If you are heating up rooms with underfloor heating or radiators, a very common way is to control the temperature of the main room by using a thermostat (this can either be the user interface or an external room thermostat), while the other rooms are controlled by so-called thermostatic valves, which open or close depending on the room temperature.

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a User interface

- The outdoor unit is connected in parallel with the gas boiler.
- The circuit contains external pump.
- The under floor heating of the main room is connected via 2 non-return valves to the outdoor unit and the gas boiler.

- The room temperature of the main room is controlled by the user interface used as thermostat.
- A thermostatic valve is installed before the underfloor heating in each of the other rooms.

INFORMATION

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

Configuration

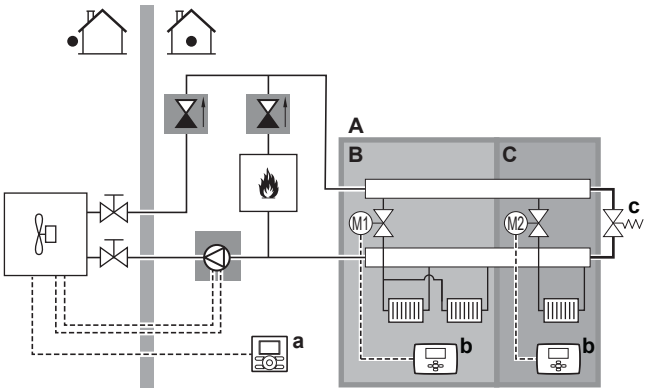
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (`RT control`): Unit operation is decided based on the ambient temperature of the user interface.

Benefits

- **Cost effective.** You do NOT need an additional external room thermostat.
- **Easy**. Same installation as for one room, but with thermostatic valves.

Under floor heating or radiators – Multiple external room thermostats

Setup



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

- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating demand.
- A bypass valve must be installed to make water recirculation possible when all shut-off valves are closed. To guarantee reliable operation, provide a minimum water flow as described in table "To check the water volume and flow rate" in "8.3 Preparing water piping" on page 26.
- The room thermostats are connected to the shut-off valves, and do NOT have to be connected to the outdoor unit. The outdoor unit will supply leaving water all the time, with the possibility to program a leaving water schedule.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	0 (`LWT control`): Unit operation is decided based on the leaving water temperature.

Benefits

Compared with underfloor heating or radiators for one room:

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

7.4 Setting up the domestic hot water tank

Only applicable in case of NHY2KOMB28+32AA gas boiler.

7.4.1 System layout – Standalone DHW tank

See "Dedicated gas boiler + Domestic hot water via tank" in "5.1.1 Dedicated gas boiler" on page 11.

7.4.2 Selecting the volume and desired temperature for the DHW tank

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

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

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

Determining the DHW consumption

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

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

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

- 3 showers
- 1 bath
- 3 sink volumes

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

Determining the volume and desired temperature for the DHW tank

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

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

Possible DHW tank volumes

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

Energy saving tips

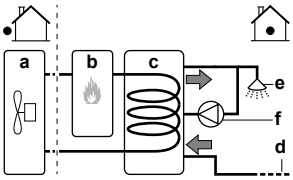
- If the DHW consumption differs from day to day, you can program a weekly schedule with different desired DHW tank temperatures for each day.
- The lower the desired DHW tank temperature, the more cost effective. By selecting a larger DHW tank, you can lower the desired DHW tank temperature.
- The higher the outdoor temperature, the better the performance of the heat pump.
  - If energy prices are the same during the day and the night, Daikin recommends to heat up the DHW tank during the day.
  - If energy prices are lower during the night, Daikin recommends to heat up the DHW tank during the night.
- When the heat pump produces domestic hot water, it cannot heat up a space. In case you need domestic hot water and space heating at the same, we recommend to produce the domestic hot water during the night when there is lower space heating demand.

7.4.3 Setup and configuration – DHW tank

- For large DHW consumptions, you can heat up the DHW tank several times during the day.
- To heat up the DHW tank to the desired DHW tank temperature, you can use the following energy sources:
  - Thermodynamic cycle of the heat pump
  - Gas boiler
- For more information about:
  - Optimizing the energy consumption for producing domestic hot water, see "10 Configuration" on page 56.
  - Connecting the electrical wiring of the standalone DHW tank to the gas boiler, see the installation manual of the DHW tank and the addendum book for optional equipment.
  - Connecting the water piping of the standalone DHW tank to the gas boiler, see the installation manual of the DHW tank, the addendum book for optional equipment, and "To connect the electrical wiring to the gas boiler" on page 44.

7.4.4 DHW pump for instant hot water

Setup



a Outdoor unit
b Gas boiler
c Tank
d Cold water
e Shower
f Domestic hot water pump

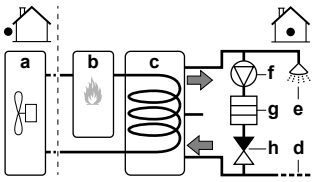
- By connecting a DHW pump, instant hot water can be available at the tap.
- The DHW pump and the installation are field supply and the responsibility of the installer.
- For more information about connecting the recirculation connection, see the installation manual of the domestic hot water tank.

Configuration

- For more information, see "10 Configuration" on page 56.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

7.4.5 DHW pump for disinfection

Setup



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

- The DHW pump is field-supplied and its installation is the responsibility of the installer.
- If using a third-party DHW tank of which the specifications are lower than those of a dedicated tank, the temperature of the DHW tank must be set to maximum 60°C. If applicable legislation requires higher temperature for disinfection, connect a DHW pump and heater element as shown above.
- If applicable legislation requires disinfection of the water piping until the tapping point, you can connect a DHW pump and heater element (if needed) as shown above.

Configuration

The outdoor unit can control DHW pump operation. For more information, see "10 Configuration" on page 56.

7.5 Setting up the energy metering

- Via the user interface, you can read out the following energy data:
  - Consumed energy (electricity)
  - Consumed gas (only in case of NHY2KOMB28+32AA gas boiler)
- You can read out the energy data:
  - For space heating
  - For domestic hot water production
- You can read out the energy data:
  - Per month
  - Per year

INFORMATION

The calculated consumed energy (electricity) and consumed gas are estimations, the accuracy cannot be guaranteed.

7.5.1 Consumed energy

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

- Calculating

Calculating the consumed energy

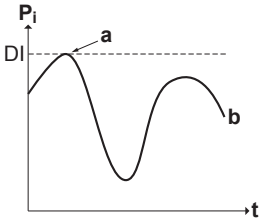
- The consumed energy is calculated internally based on:
  - The actual power input of the outdoor unit
  - The set capacity of the bottom plate heater (if applicable)
  - The voltage
- Setup and configuration: To get accurate energy data, measure the capacity (resistance measurement) and set the capacity via the user interface for the bottom plate heater (if applicable).

7.6 Setting up the power consumption control

- The power consumption control:
  - Allows you to limit the power consumption of the outdoor unit.
  - Configuration: Set the power limitation level and how it has to be achieved via the user interface.
- The power limitation level can be expressed as:
  - Maximum running current (in A)
  - Maximum power input (in kW)
- The power limitation level can be activated permanently, but not by digital inputs.

7.6.1 Permanent power limitation

Permanent power limitation is useful to assure a maximum power or current input of the system. In some countries, legislation limits the maximum power consumption for space heating and DHW production.



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

Setup and configuration

- No additional equipment needed.
- Set the power consumption control settings in [A.6.3.1] via the user interface (for the description of all settings, see "10 Configuration" on page 56):
  - Select full time limitation mode
  - Select the type of limitation (power in kW or current in A)
  - Set the desired power limitation level

NOTICE

Set a minimum power consumption of ±1.6 kW to guarantee:

- Defrost operation. Otherwise, if defrosting is interrupted several times, the heat exchanger will freeze up.
- Space heating and DHW production.

7.7 Setting up an external temperature sensor

You can connect one external temperature sensor. It measures the outdoor ambient temperature. We recommend to use an external temperature sensor in the following cases:

Outdoor ambient temperature

- In the outdoor unit, the outdoor ambient temperature is measured. Therefore, the outdoor unit must be installed on a location:
  - At the north side of the house or at the side of the house where the most heat emitters are located
  - That is NOT exposed to direct sunlight
- If this is NOT possible, Daikin recommends to connect a remote outdoor sensor (option EKRSCA1).
- Setup: For installation instructions, see the installation manual of the remote outdoor sensor and the addendum book for optional equipment.
- Configuration: Select outdoor sensor [A.2.2.B].
- When the power saving functionality of the outdoor unit is active (see "10 Configuration" on page 56), the outdoor unit is turned down to reduce standby energy losses. As a result, the outdoor ambient temperature is NOT read out.
- If the desired leaving water temperature is weather dependent, the full time outdoor temperature measurement is important. This is another reason to install the optional outdoor ambient temperature sensor.

INFORMATION

The external outdoor ambient sensor data (either averaged or instantaneous) is used in the weather-dependent control curves. To protect the outdoor unit, the internal sensor of the outdoor unit is always used.

8 Preparation

8.1 Overview: Preparation

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

It contains information about:

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

8.2 Preparing the installation site

Do NOT install the unit in places often used as work place. In case of construction works (e.g. grinding works) where a lot of dust is created, the unit MUST be covered.

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

WARNING

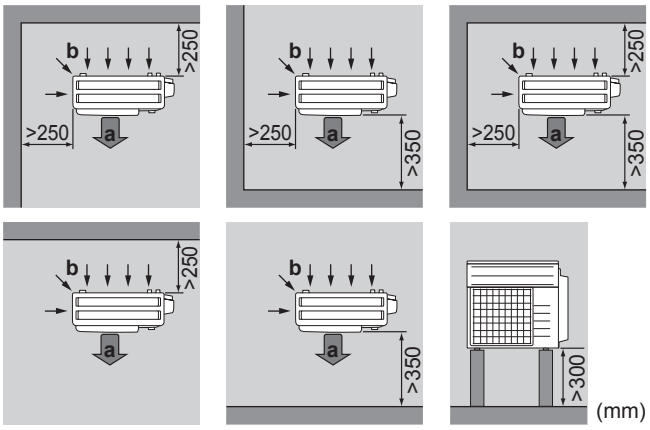
The appliance shall be stored in a room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).

8.2.1 Installation site requirements of the outdoor unit

INFORMATION

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

Mind the following spacing guidelines:



a Air outlet
b Air inlet

NOTICE

The height of the wall on the outlet side of the outdoor unit MUST be ≤1200 mm.

NOTICE

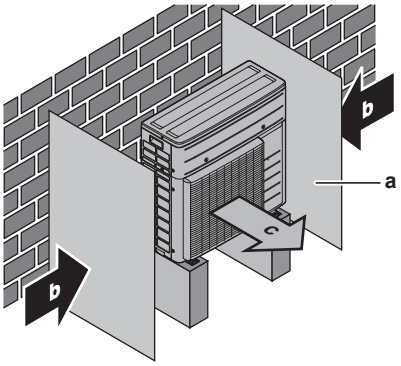
- Do NOT stack the units on each other.
- Do NOT hang the unit on a ceiling.

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

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

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

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



a Baffle plate
b Prevailing wind direction
c Air outlet

Do NOT install the unit in the following places:

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

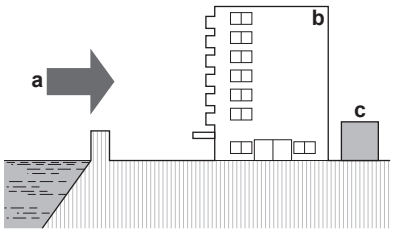
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

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

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

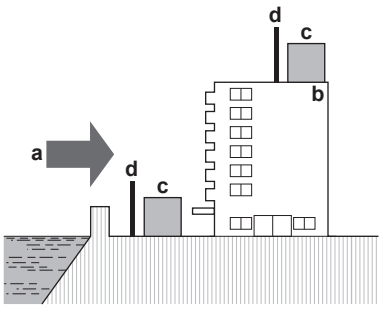
Install the outdoor unit away from direct sea winds.

Example: Behind the building.



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

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



a Sea wind
b Building
c Outdoor unit
d Windbreaker

The outdoor unit is designed for outdoor installation only, and for the following ambient temperatures:

Space heating operation	–14~25°C
Domestic hot water production	–14~35°C

Special requirements for R32

The outdoor unit contains an internal refrigerant circuit (R32), but you do NOT have to do any refrigerant field piping, or refrigerant charging.

The total refrigerant charge in the system is ≤1.842 kg, so the system is NOT subjected to any requirements to the installation room. However, mind the following requirements and precautions:

WARNING

- Do NOT pierce or burn.
- 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

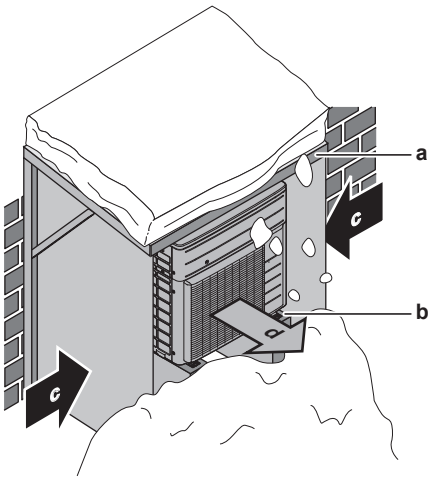
The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).

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.

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

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



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

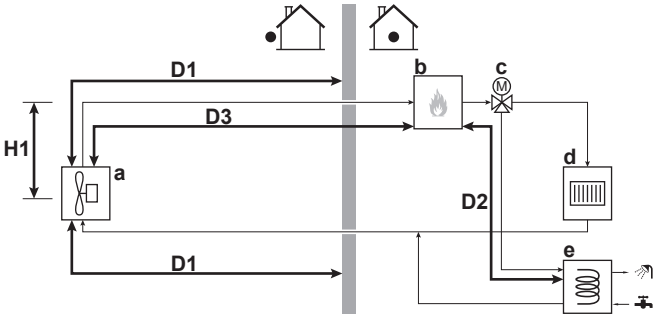
In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow. See "9.3 Mounting the outdoor unit" on page 31 for more details.

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

8.3 Preparing water piping

8.3.1 Water piping lengths and height difference

In case of NHY2KOMB28+32AA gas boiler



a Outdoor unit
b NHY2KOMB28+32AA gas boiler
c 3-way valve
d Space heating circuit
e DHW tank (if applicable)

What?		Distance
H1	Maximum height difference between outdoor unit and NHY2KOMB28+32AA gas boiler	Depends on the expansion vessel (option on NHY2KOMB28+32AA gas boiler). A distance of 10 m is recommended.
—	Maximum total length of the water piping (indoor part + outdoor part)	Depends on the external static pressure (ESP) of the system.
D1	Maximum length of the outdoor part of the water piping (to prevent freeze-up of the water piping)	30 m
D2	Maximum distance between NHY2KOMB28+32AA gas boiler and DHW tank (if applicable)	10 m
D3	Maximum distance between outdoor unit and NHY2KOMB28+32AA gas boiler	See table below.

If...			Then D3...	
Glycol?	**Ø**	**Condition[a]**	**ESP 25 kPa**	**ESP 35 kPa**
Water (without glycol)	3/4"	ΔT 5°C → 11.5 l/min	16 m	8.5 m
		ΔT 8°C → 7.2 l/min	63 m	45 m
	1"	ΔT 5°C → 11.5 l/min	89 m	54 m
		ΔT 8°C → 7.2 l/min	304 m	224 m
Water + glycol	1"	Start-up with glycol at –15°C → 7.0 l/min	38 m	25 m
		ΔT 5°C with glycol at 20°C → 12.8 l/min	2 m	—
		ΔT 8°C with glycol at 20°C → 8.0 l/min	134 m	85 m

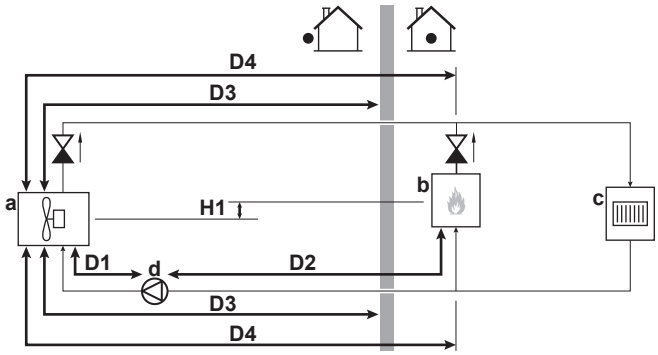
(a) Based on capacity of 4 kW
ESP External static pressure calculated with 10×(90° elbow)

Hydronic Piping Calculation tool

For other cases the maximum water piping length can be determined using the Hydronic Piping Calculation tool. The Hydronic Piping Calculation tool is part of the Heating Solutions Navigator which can be reached via https://professional.standbyme.daikin.eu. Please contact your dealer if you have no access to Heating Solutions Navigator.

This recommendation ensures good operation of the unit, however, local regulations may differ and shall be followed.

In case of third-party gas boiler



a Outdoor unit
b Third-party gas boiler
c Space heating circuit
d External pump

What?		Distance
H1	Maximum height difference between outdoor unit and third-party gas boiler	Depends on the expansion vessel in the third-party gas boiler. A distance of 10 m is recommended.
—	Maximum total length of the water piping (indoor part + outdoor part)	Depends on the external static pressure (ESP) of the system.
D1	Maximum distance between outdoor unit and external pump	10 m
D2	Distance between external pump and gas boiler	As short as possible.
D3	Maximum length of the outdoor part of the water piping (to prevent freeze-up of the water piping)	30 m
D4	Maximum distance between outdoor unit and third-party gas boiler	See table below.

If...			Then D4...	
Glycol?	**Ø**	**Condition[(a)]**	**ESP 25 kPa**	**ESP 35 kPa**
Water (without glycol)	3/4"	ΔT 5°C → 11.5 l/min	20 m	13 m
		ΔT 8°C → 7.2 l/min	68 m	50 m
	1"	ΔT 5°C → 11.5 l/min	123 m	88 m
		ΔT 8°C → 7.2 l/min	340 m	260 m
Water + glycol	1"	Start-up with glycol at –15°C → 7.0 l/min	44 m	30 m
		ΔT 5°C with glycol at 20°C → 12.8 l/min	36 m	14 m
		ΔT 8°C with glycol at 20°C → 8.0 l/min	170 m	120 m

(a) Based on capacity of 4 kW
ESP External static pressure calculated with 10×(90° elbow)

8.3.2 Water circuit requirements

INFORMATION

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

NOTICE

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

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

NOTICE

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

- **Closed circuit.** Use the outdoor unit ONLY in a closed water system. Using the system in an open water system will lead to excessive corrosion.
- **Piping length.** It is recommended to avoid long runs of piping between the domestic hot water tank and the hot water end point (shower, bath,…) and to avoid dead ends.
- **Piping diameter.** Select the water piping diameter in relation to the required water flow and the available external static pressure of the pump. See "17 Technical data" on page 94 for the external static pressure curves of the outdoor unit.
- **Water flow.** See "8.3.4 To check the water volume and flow rate" on page 28.

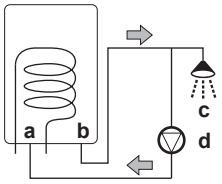
Minimum required flow rate
7 l/min[(a)]

(a) Below this value, no stable operation can be guaranteed.

- **Field supply components – Water and glycol.** Only use materials that are compatible with the water (and, if applicable, glycol) used in the system, and with the materials used in the outdoor unit.
- **Field supply components – Water pressure and temperature.** Check that all components in the field piping can withstand the water pressure and water temperature.
- **Water pressure.** The maximum water pressure is 4 bar. Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- **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 temperatures as indicated in "5.1.1 Dedicated gas boiler" on page 11.
- **Drainage – Low points.** Provide drain taps at all low points of the system in order to allow complete drainage of the water circuit.
- **Drainage – Pressure relief valve.** Provide a proper drain for the pressure relief valve to avoid water coming into contact with electrical parts.

- **Air vents.** Provide air vents at all high points of the system, which must also be easily accessible for servicing. If you use automatic air purge valves, check that the air purges are NOT tightened too much, so that automatic release of air in the water circuit is possible.
- **Zn-coated parts.** Never use Zn-coated parts in the water circuit. Because the unit's internal water circuit uses copper piping, excessive corrosion may occur.
- **Non-brass metallic piping.** When using non-brass metallic piping, insulate the brass and non-brass properly so that they do NOT make contact with each other. This to prevent galvanic corrosion.
- **Valve – Separating circuits.** When using a 3-way valve in the water circuit make sure that the domestic hot water circuit and the floor heating circuit is fully separated.
- **Valve – Change-over time.** When using a 2-way valve or a 3-way valve in the water circuit, the maximum change-over time of the valve must be 60 seconds.
- **Filter.** It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from foul heating piping, it is recommended to use a magnetic or cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.
- **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 "7.4.5 DHW pump for disinfection" on page 23 and "Domestic hot water control: advanced" on page 64.
- **Domestic hot water tank – installation of third-party tank**
  For a third-party tank, the maximum tank set point is 60°C.
  See the installation manual of the domestic hot water tank for more information.
- **Domestic hot water tank – installation of third-party tank with dedicated tank specifications**
  The dedicated tank specifications are:
  - coil size is ≥1.05 m^2,
  - a sensor pocket is foreseen above the heating coil. The tank sensor should not be in contact with water.

  If the third-party tank has at least the same specifications of a dedicated tank, the domestic hot water setting [E-07] can be changed to 0. This allows for a temperature setpoint higher than 60°C and for the heat pump to heat up the tank. See "Quick wizard: Options" on page 58.
- **Thermostatic mixing valves.** In accordance with the applicable legislation, it may be necessary to install thermostatic mixing valves.
- **Hygienic measures.** The installation must be in compliance with the applicable legislation and may require additional hygienic installation measures.
- **Recirculation pump.** In accordance with the applicable legislation, it may be required to connect a recirculation pump in between the hot water end point and the recirculation connection of the domestic hot water tank.



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

8.3.3 Formula to calculate the expansion vessel pre-pressure

The pre-pressure (Pg) of the vessel depends on the installation height difference (H). For more information on the formula, see the manual of the third-party expansion vessel.

8.3.4 To check the water volume and flow rate

Minimum water volume

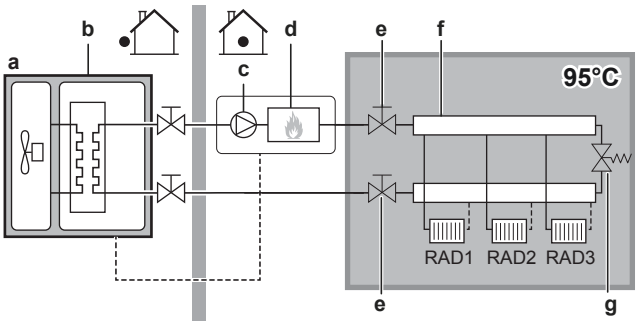
Check that the total water volume in the installation is minimum 20 litre, the internal water volume of the outdoor unit NOT included.

INFORMATION

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

NOTICE

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



a Outdoor unit
b Heat exchanger
c Pump
d Boiler
e Shut-off valve (field supply)
f Collector
g Bypass valve (field supply)
RAD1…3 Radiator (field supply)

Minimum flow rate

A minimum flow rate must be guaranteed so that the outdoor unit does not go in high pressure error (A5). For guidelines on flow rates, see the tables in "8.3.1 Water piping lengths and height difference " on page 26.

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, the heat pump generates a high pressure error (A5).

Minimum required flow rate
7 l/min[(a)]

(a) Below this value, no stable operation can be guaranteed.

8.3.5 Changing the pre-pressure of the expansion vessel

NOTICE

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

The expansion vessel is available with the B-pack (see " Possible options for the gas boiler" on page 14) or as a third-party vessel. For more information on how to change the pre-pressure, see the manual of the expansion vessel.

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.

8.4 Preparing electrical wiring

8.4.1 About preparing electrical wiring

INFORMATION

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

WARNING

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

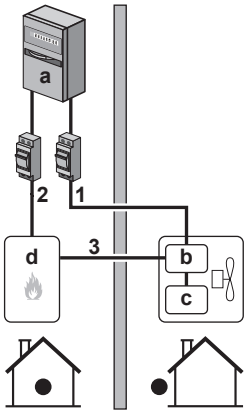
WARNING

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

WARNING

ALWAYS use multicore cable for power supply cables.

8.4.2 Overview of electrical connections except external actuators



a Normal power supply
b Hydro part of the outdoor unit
c Refrigerant part of the outdoor unit
d Gas boiler
1 Power supply for outdoor unit
2 Power supply for gas boiler
3 In case of NHY2KOMB28+32AA gas boiler: Interconnection cable between outdoor unit and gas boiler
In case of third-party gas boiler: Bivalent signal for third-party gas boiler

8.4.3 Overview of electrical connections for external and internal actuators

NOTICE

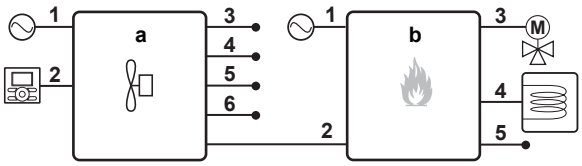
Field wiring – Temperature. Make sure that all field wiring withstands 90°C.

In case of system with NHY2KOMB28+32AA **gas boiler**

The following illustration shows the required field wiring.

INFORMATION

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



a Outdoor unit
b NHY2KOMB28+32AA gas boiler

Connections to outdoor unit:

Item	Description	Wires	Maximum running current
Power supply			
1	Power supply for outdoor unit	2+GND	(a)
User interface			
2	User interface	2	(b)
Optional equipment			
3	Bottom plate heater	2+GND	(c)
4	Outdoor ambient temperature sensor	2	(d)
5	LAN adapter	2	(e)
Field supplied components			
6	Domestic hot water pump	2+GND	(d)

(a) See the name plate on the outdoor unit.

(b) Cable section 0.75 mm² till 1.25 mm²; maximum length: 200 m.
(c) Part of optional equipment
(d) Minimum cable section 0.75 mm².
(e) Cable section 0.75 mm² till 1.25 mm²; maximum length: 200 m. These wires MUST be sheathed. Recommended strip length: 6 mm.

NOTICE

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

Connections to NHY2KOMB28+32AA gas boiler:

Item	Description	Wires	Maximum running current
Power supply			
1	Power supply gas boiler	2+GND	(a)
Interconnection cable			
2	Interconnection cable between outdoor unit and gas boiler	2	(b)
Optional equipment			
3	3-way valve	3	100 mA(c)
4	Domestic hot water tank thermistor	2	(d)
5	Room thermostat/heat pump convector	2	100 mA(c)

(a) See the name plate on the gas boiler.
(b) Cable section 0.75 mm² till 1.25 mm²; maximum length: 200 m. This cable is field supplied.
(c) Cable section 0.75 mm² till 1.25 mm².
(d) The thermistor and connection wire (11 m) are available as option (EKTH3 or EKTH4).

NOTICE

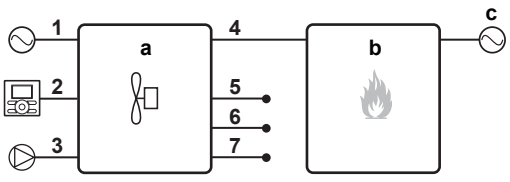
More technical specifications of the different connections are indicated on the inside of the gas boiler.

In case of system with third-party gas boiler

The following illustration shows the required field wiring.

INFORMATION

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



a Outdoor unit
b Third-party gas boiler
c Power supply for gas boiler

Connections to outdoor unit:

Item	Description	Wires	Maximum running current
Power supply			
1	Power supply for outdoor unit	2+GND	(a)
User interface			
2	User interface	2	(b)
External pump + bivalent signal			
3	External pump	2 and 2+GND	(c)
4	Bivalent signal for third-party gas boiler(g)	2	(d)
Optional equipment			
5	Bottom plate heater	2+GND	(e)
6	Outdoor ambient temperature sensor	2	(d)
7	LAN adapter	2	(f)

(a) See the name plate on the outdoor unit.
(b) Cable section 0.75 mm² till 1.25 mm²; maximum length: 200 m.
(c) The external pump is part of mandatory option EKADDONJH; the 2 external pump cables (PWM signal and power supply) are part of mandatory option EKADDONJH2.
(d) Minimum cable section 0.75 mm².
(e) Part of optional equipment
(f) Cable section 0.75 mm² till 1.25 mm²; maximum length: 200 m. These wires MUST be sheathed. Recommended strip length: 6 mm.
(g) Field supplied

NOTICE

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

9 Installation

9.1 Overview: Installation

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

Typical workflow

Installation typically consists of the following stages:

1 Mounting the outdoor unit
2 Mounting the gas boiler
3 Connecting the condensate pipe
4 Connecting the water piping
5 Connecting the electrical wiring
6 Connecting the gas piping
7 Connecting the gas boiler to the flue gas system
8 Finishing the installation of the outdoor unit
9 Finishing the installation of the gas boiler

9.2 Opening the units

9.2.1 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

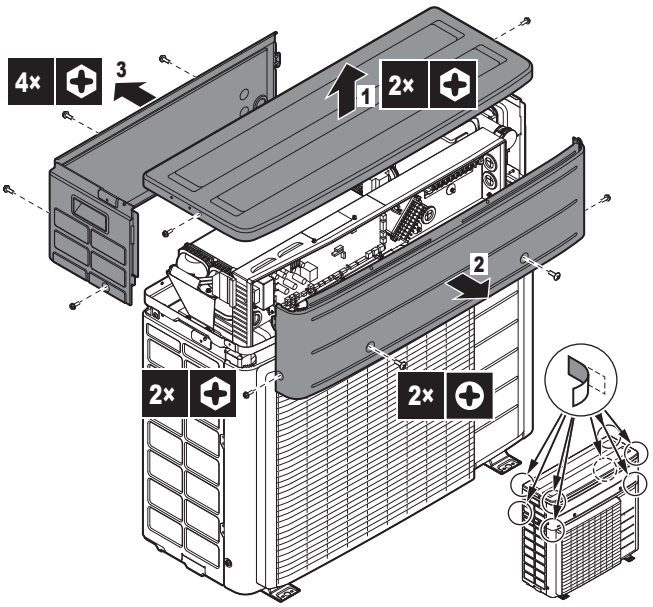
DANGER: RISK OF ELECTROCUTION

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

9.2.2 To open the outdoor unit

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING



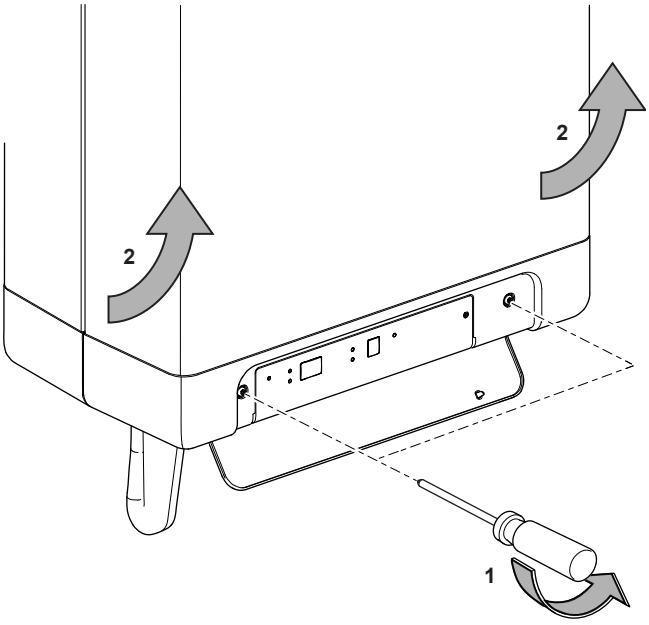
1 Open the top plate.

2 Open the front plate.

3 If necessary, open the rear plate. This is, for example, necessary in the following cases:

- When you install the freeze protection valve inside the outdoor unit.
- When you install the bottom plate heater.

9.2.3 To open the gas boiler



1 Open the display cover.

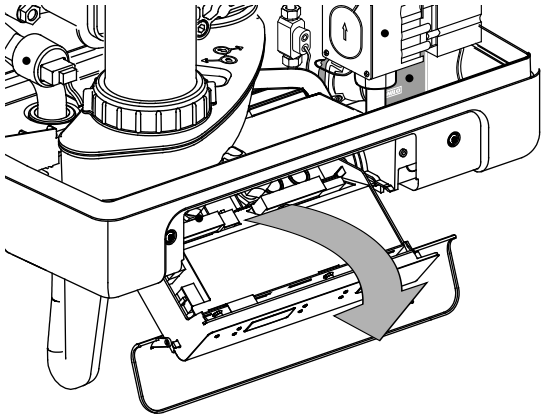
2 Unscrew both screws.

3 Tilt the front panel towards you and remove the front panel.

9.2.4 To open the switch box cover of the gas boiler

1 Open the gas boiler, see "9.2.3 To open the gas boiler" on page 31.

2 Pull the boiler controller unit forwards. The boiler controller will tip downwards to provide access.



9.3 Mounting the outdoor unit

9.3.1 About mounting the outdoor unit

When

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

Typical workflow

Mounting the outdoor unit typically consists of the following stages:

1 Providing the installation structure.

2 Installing the outdoor unit.

3 Providing drainage.

4 Preventing the unit from falling over.

5 Protecting the unit against snow and wind by installing a snow cover and baffle plates. See "Preparing installation site" in "8 Preparation" on page 24.

9.3.2 Precautions when mounting the outdoor unit

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

9.3.3 To provide the installation structure

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

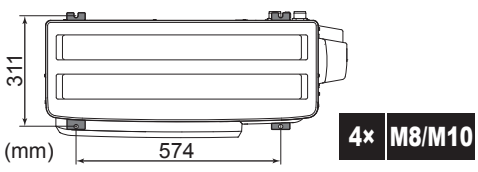
Fix the unit securely by means of foundation bolts in accordance with the foundation drawing.

This topic shows different installation structures. For all, use 4 sets of M8 or M10 anchor bolts, nuts and washers. In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow.

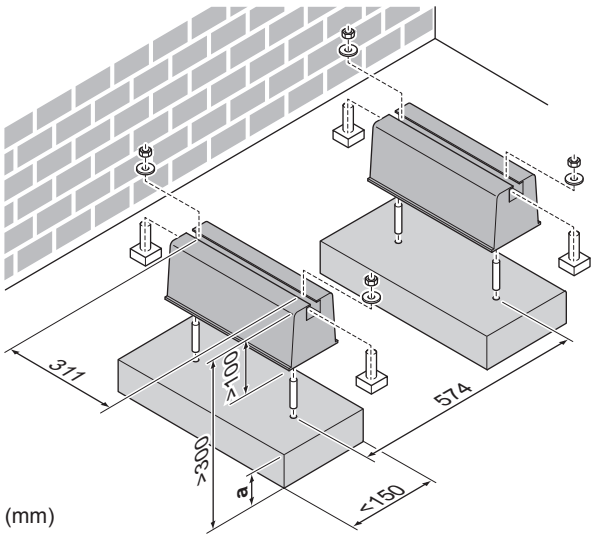
INFORMATION

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

Anchor points



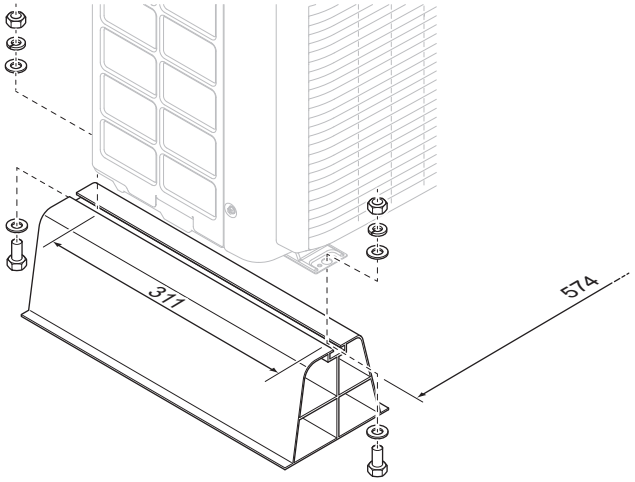
Option 1: On mounting feet "flexi-foot with strut"



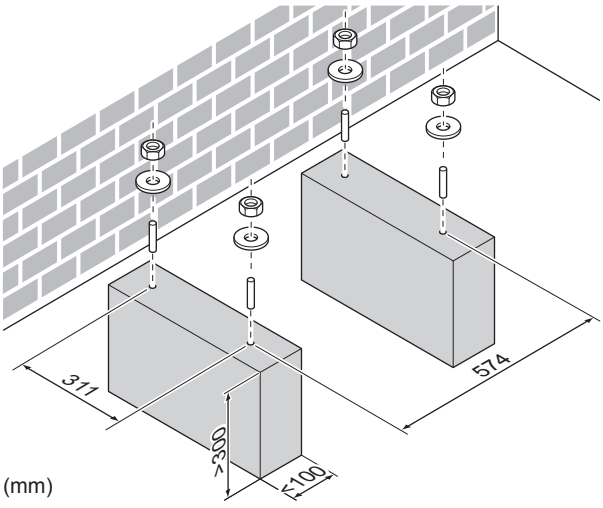
(mm)

a Maximum snowfall height

Option 2: On plastic mounting feet

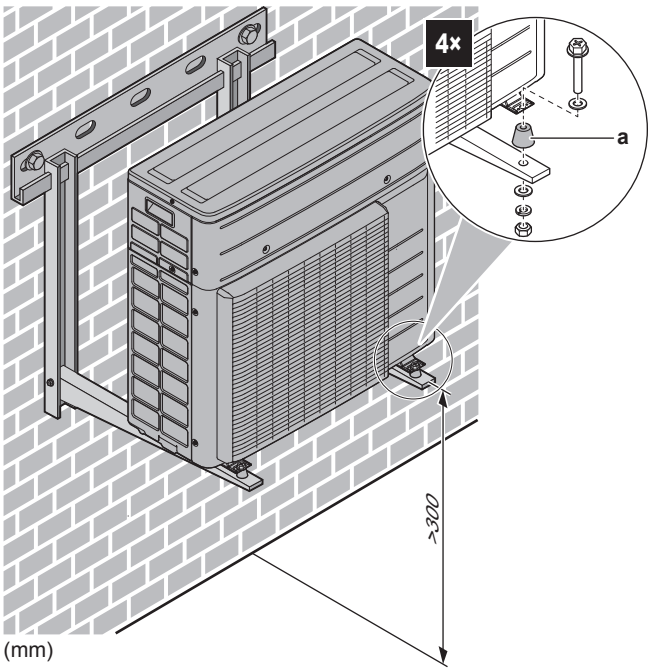


Option 3: On a pedestal



(mm)

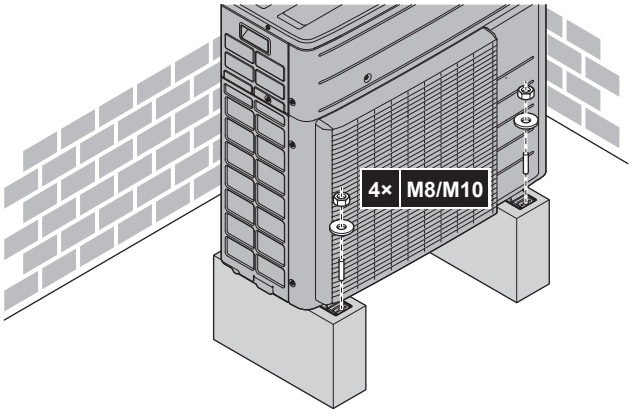
Option 4: On brackets to the wall



(mm)

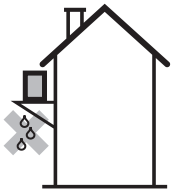
a Anti-vibration rubber (field supply)

9.3.4 To install the outdoor unit



9.3.5 To provide drainage

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



NOTICE

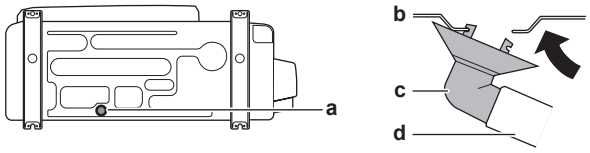
Cold climates. If the unit is installed in a cold climate:

- Take adequate measures so that the evacuated condensate CANNOT freeze.
- Do NOT use the drain plug and drain hose with the outdoor unit. **Possible consequence:** Drain water might freeze, decreasing the heating capacity.

NOTICE

Provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the expected level of snow.

Except in cold climates, use the drain plug and a hose for drainage.



a Drain hole
b Bottom frame
c Drain plug (delivered as accessory)
d Hose (field supply)

9.3.6 To prevent the outdoor unit from falling over

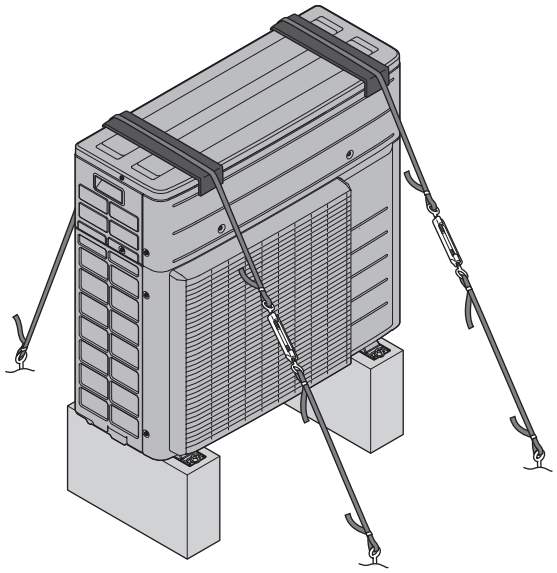
In case the unit is installed in places where strong wind can tilt the unit, take following measure:

1 Prepare 2 cables as indicated in the following illustration (field supply).

2 Place the 2 cables over the outdoor unit.

3 Insert a rubber sheet between the cables and the outdoor unit to prevent the cables from scratching the paint (field supply).

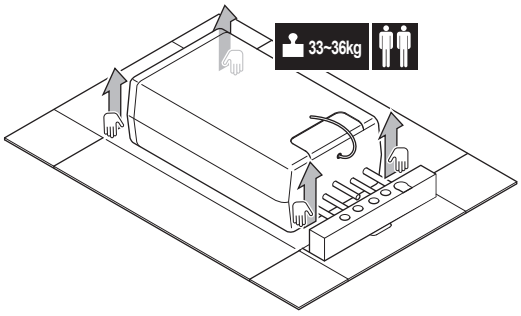
4 Attach the ends of the cables and tighten them.



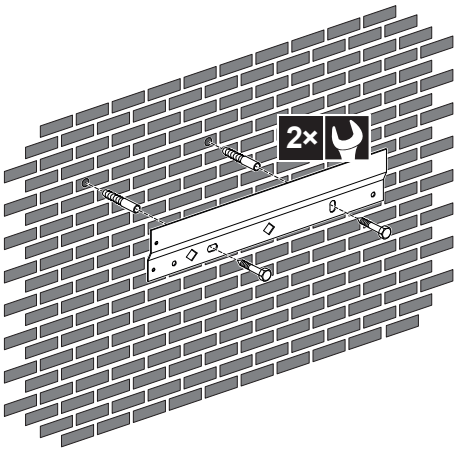
9.4 Mounting the gas boiler

9.4.1 To install the gas boiler

1 Lift the unit from the package.

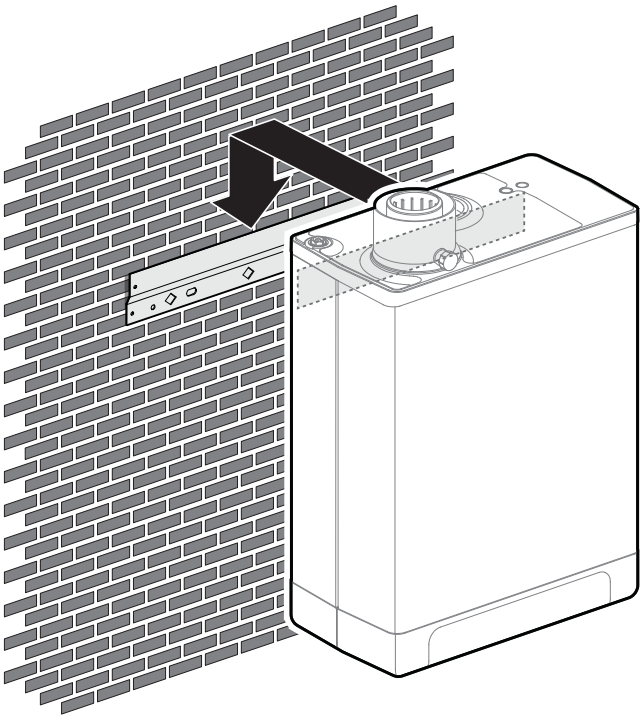


2 The bracket to mount the boiler on the heat pump module is an accessory of the gasboiler. Fix the wall bracket to the wall with 2 M8 bolts.



3 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).

4 Tilt the top of the unit at the position of the wall bracket and slide the boiler downwards to fix the boiler bracket onto the wall bracket.



5 Make sure the gas boiler is fixed properly to the wall.

9.4.2 To install the condensate trap

INFORMATION

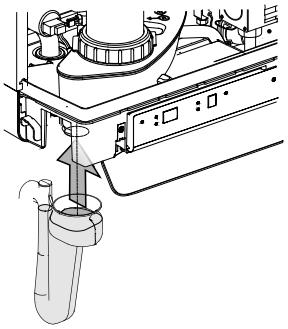
The boiler is provided with a Ø25 mm flexible pipe on the condensate trap.

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

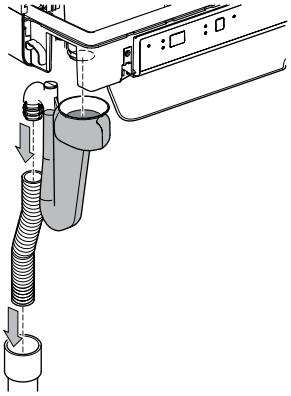
1 Fit the flexible tube (accessory) to the condensate trap outlet.

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.

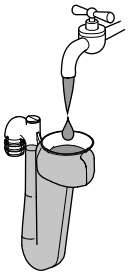


4 Connect the flexible tube (where applicable with the overflow pipe from the pressure relief valve) to the drain via an open connection.



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.

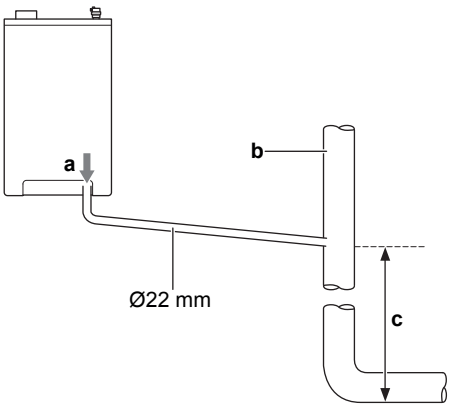
9.5 Condensate pipe work

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.

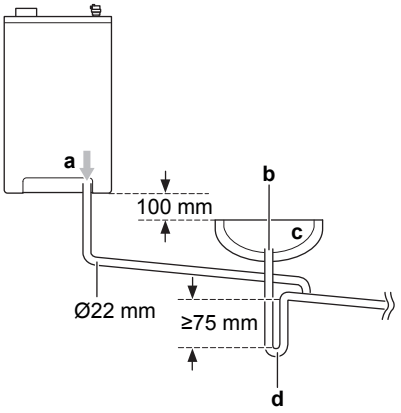
9.5.1 Internal connections

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.

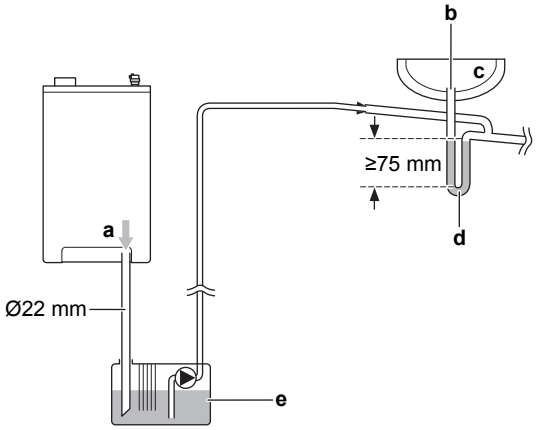


a Condensate discharge from boiler
b Soil and vent stack
c Sink or basin with integrate overflow
d 75 mm waste trap and air break

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.



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
e Condensate pump

9.5.2 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.

9.6 Connecting the water piping

9.6.1 About connecting the water piping

Before connecting the water piping

Make sure the outdoor 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 outdoor unit.
2 Providing drainage for the pressure relief valve.
3 Connecting the water piping of the gas boiler.
4 Protecting the water circuit against freezing.
5 Filling the space heating circuit.
6 Filling the domestic water circuit of the gas boiler.
7 Filling the domestic hot water tank (if applicable).
8 Insulating the water piping.

9.6.2 Precautions when connecting the water piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

9.6.3 Connecting the water piping of the outdoor unit

To connect the water piping

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. Make sure that the tightening torque does NOT exceed 30 N•m.

NOTICE

Shut-off valves. We recommend to connect shut-off valves to facilitate service and maintenance. They are available as option (EKBALLV1). If you do not install shut-off valves, make sure to install air purge valves on the water inlet and outlet.

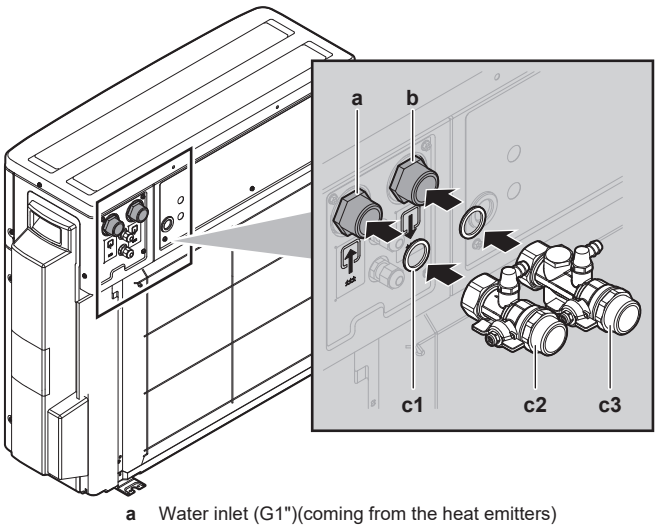
NOTICE

Drain/fill point. Foresee a drain/fill point to drain or fill the space heating circuit. The fill/drain point can be:

- Field supplied
- In case of NHY2KOMB28+32AA gas boiler: Part of option EKFL1A (filling loop kit)
- In case of third-party gas boiler: Part of the existing installation

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 (G1")(coming from the heat emitters)

b Water outlet (G1")(going to the gas boiler in case of NHY2KOMB28+32AA gas boiler)
c1~c3 Parts of option EKBALLV1
c1: O-rings
c2: Shut-off valve
c3: Shut-off valve with integrated connection for the vacuum breaker (if applicable)

1 Connect the O-rings and shut-off valves.
2 Connect the field piping on the shut-off valves.
3 In case of connection with the optional domestic hot water tank, see the installation manual of the domestic hot water tank.

NOTICE

In case of a third-party gas boiler: Install a manometer in the system.

NOTICE

Install air purge valves at all local high points.

NOTICE

In case an optional domestic hot water tank is installed: A pressure relief valve (field supply) with an opening pressure of maximum 10 bar (= 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.
- It is recommended to install a pressure reducing valve on the cold water inlet in accordance with the applicable legislation.
- An expansion vessel should be installed on the cold water inlet in accordance with the applicable legislation.
- It is recommended to install the pressure relief valve on a higher position than the top of the domestic hot water tank. Heating of the domestic hot water tank causes water to expand and without pressure relief valve the water pressure inside the tank can rise above the tank design pressure. Also the field installation (piping, tapping points, etc.) connected to the tank is subjected to this high pressure. To prevent this, a pressure relief valve needs to be installed. The overpressure prevention depends on the correct operation of the field installed pressure relief valve. If this is NOT working correctly, overpressure will deform the tank and water leakage may occur. To confirm good operation, regular maintenance is required.

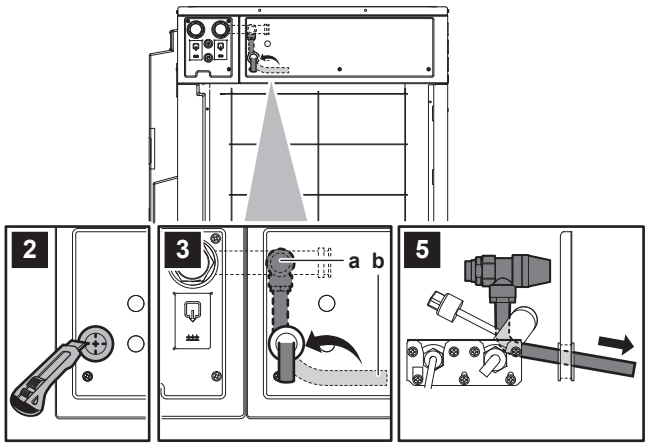
To provide drainage for the pressure relief valve

NOTICE

If overpressure occurs, the system will release some of the liquid through the pressure relief valve. The pressure relief valve of the outdoor unit is designed to open at 3 bar.

If glycol was added to the system, take adequate measures to safely recover it when the pressure relief valve opens.

In any case, make sure that the flexible hose of the pressure relief valve is ALWAYS free to release pressure.



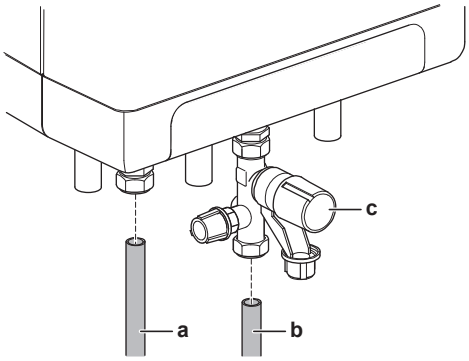
a Pressure relief valve
b Flexible hose (drain)

1 Open the top plate, front plate, and rear plate. See "9.2.2 To open the outdoor unit" on page 30.
2 Make a cross-cut in the rubber grommet on the rear plate.
3 Route the flexible hose through the grommet.
4 Close the rear plate.
5 Pull the flexible hose with a light force to make sure that the flexible hose slopes down. This prevents water from staying and/or freezing inside the hose.
6 Close the front plate and top plate.
7 If glycol was added to the system, take adequate measures to safely recover it when the pressure relief valve opens.

9.6.4 Connecting the water piping of the gas boiler

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

1 Flush the installation thoroughly to clean.



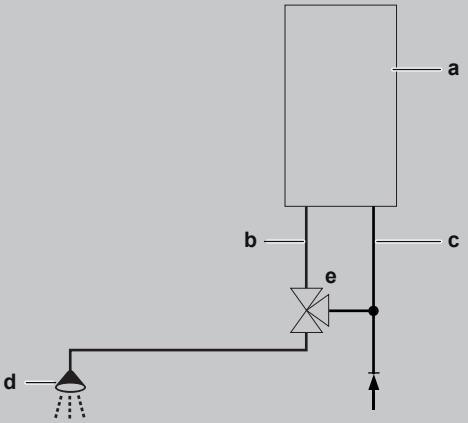
a Domestic hot water outlet
b Cold water inlet
c Pressure relief valve (field supply)

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

In case of high leaving water set points for space heating (either a high fixed set point or a high weather-dependent set point at low ambient temperatures), the heat exchanger of the boiler can be heated up to temperatures higher than 70°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 70°C. To prevent scalding, it is recommended to install a thermostatic valve according to the following schematic:



a=boiler, **b**=domestic hot water from the boiler, **c**=cold water inlet, **d**=shower, **e**=thermostatic valve (field supply)

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.

To connect the water piping for space heating

NOTICE

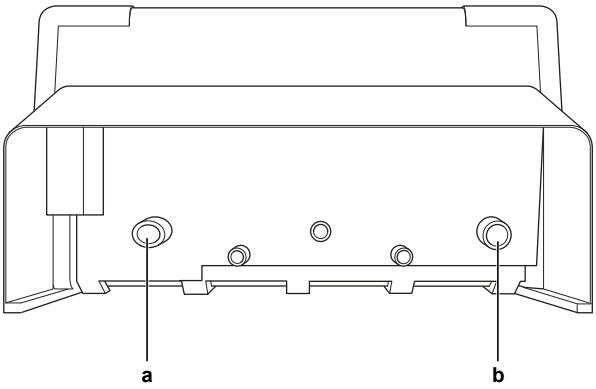
To prevent leakages, do NOT rotate existing connections.

NOTICE

Mount the pipes without tension to avoid ticking sounds from the pipes.

1 Rinse the space heating installation carefully.

2 Connect the space heating outlet (a) and space heating inlet (b) to their connections as indicated in the following illustration:



Fit the space heating installation with the following parts:

- A filling/draining tap in the space heating inlet, immediately underneath the unit.
- A draining tap at the lowest point of the installation.
- An overflow valve of 3 bar in the input pipe at a distance of no more than 500 mm from the unit. Between the unit and the overflow valve there may be no valve or constriction.
- An expansion vessel in the space heating inlet (in the B-pack or in the installation).
- If there are pipes running up, use a check valve within close distance of the unit. This prevents a thermosiphon effect from occurring during tap water operation.

Note that the optional valve kits EKVK4A and EKVK6A can also be used to connect the space heating installation.

NOTICE

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

9.6.5 To protect the water circuit against freezing

About freeze protection

Frost can damage the system. To prevent the hydraulic components from freezing, the software is equipped with special frost protection functions, that include the activation of pump in case of low temperatures.

However, in case of a power failure, these functions cannot guarantee protection.

Do one of the following to protect the water circuit against freezing:

- Add glycol to the water. Glycol lowers the freezing point of the water.
- Install freeze protection valves. Freeze protection valves drain the water from the system before it can freeze.

NOTICE

If you add glycol to the water, do NOT install freeze protection valves. **Possible consequence:** Glycol leaking out of the freeze protection valves.

Freeze protection by glycol

Adding glycol to the water lowers the freezing point of the water.

The required concentration depends on the lowest expected outdoor temperature, and on whether you want to protect the system from bursting or from freezing. To prevent the system from freezing, more glycol is required. Add glycol according to the table below.

INFORMATION

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

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

NOTICE

- The required concentration might differ depending on the type of glycol. ALWAYS compare the requirements from the table above with the specifications provided by the glycol manufacturer. If necessary, meet the requirements set by the glycol manufacturer.
- The added concentration of glycol should NEVER exceed 35%.
- If the liquid in the system is frozen, the pump will NOT be able to start. Mind that if you only prevent the system from bursting, the liquid inside might still freeze.
- When water is at standstill inside the system, the system is very likely to freeze and get damaged.

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

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

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

WARNING

Ethylene glycol is toxic.

NOTICE

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

WARNING

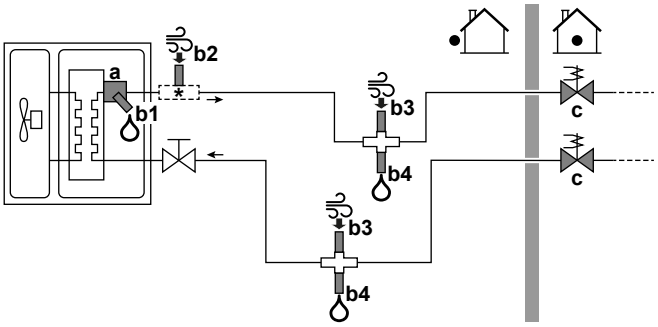
Due to presence of glycol, corrosion of the system is possible. Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by the presence of copper and high temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that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

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

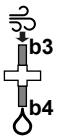
Adding glycol to the water circuit reduces the maximum allowed water volume of the system. For more information, see the manual of the expansion vessel.

Freeze protection by freeze protection valves

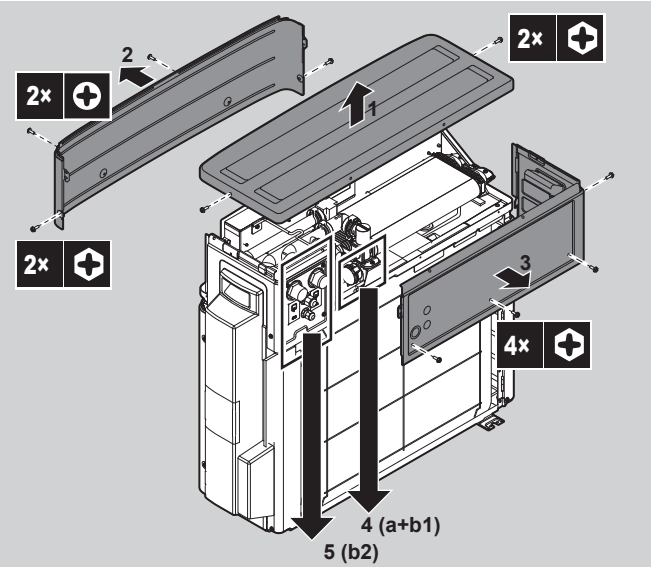
When no glycol is added to the water, you can use freeze protection valves to drain the water from the system before it can freeze. To do so, install the following parts:



a+b1+b2 Protection for the outdoor unit (*: there are 2 possibilities to connect **b2**; see below).
b3+b4 Protection for the field piping
c Isolation of water inside the house when there is a power interruption

Part	Description
a+b1+b2	(Mandatory – Delivered as accessory). **a** Connection piece for **b1** **b1** Freeze protection valve (for water drainage) **b2** Vacuum breaker (head-up for air supply) These parts are necessary to protect the piping inside the outdoor unit against freezing. **Note:** These parts do NOT protect the field piping against freezing.
b3+b4	Use AFVALVEHY2. It is the installer's responsibility to protect the field piping against freezing. One possibility is to install freeze protection valves at all lowest points of the field piping. If you do so, always install the freeze protection valves in pair:  **b3** Vacuum breaker (head-up for air supply) **b4** Freeze protection valve (head-down for water drainage)
c	**c** Normally closed valves (Recommended – Field supply). Normally closed valves can prevent that all water from the system is drained when the freeze protection valves open. ▪ **When there is a power interruption:** The normally closed valves close and isolate the water inside the house. If the freeze protection valves open, only the water outside the house is drained. ▪ **In other circumstances** (example: when there is a pump failure): The normally closed valves remain open. If the freeze protection valves open, the water from inside the house is also drained.

To connect a+b1+b2



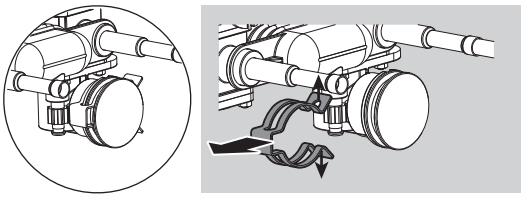
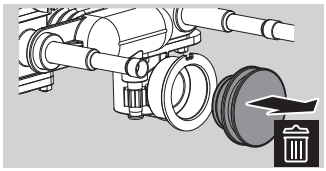
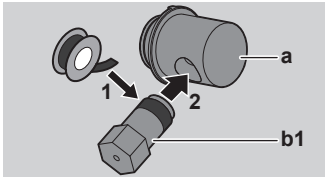
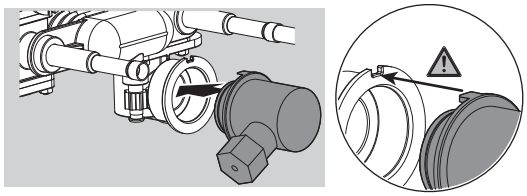
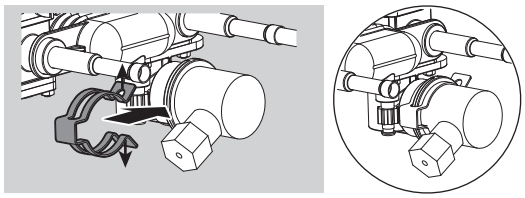
a Connection piece for **b1**
b1 Freeze protection valve (for water drainage)
b2 Vacuum breaker (head-up for air supply)

1 Open the top plate.

2 Open the front plate.

3 Open the rear plate.

4 Connect **a+b1** as follows:

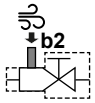
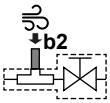
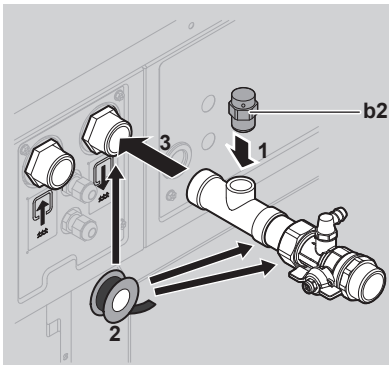
1	Remove the clip. 
2	Remove and discard the stop with the sealing. 
3	Attach the freeze protection valve (**b1**) to the connection piece (**a**), using thread sealant. 
4	Attach the connection piece to the outdoor unit. 
5	Attach the clip. 
6	Close the rear plate, front plate and top plate.

5 Do one of the following to connect **b2** (2 possibilities):

NOTICE

Vacuum breaker (b2). To make proper drainage through the freeze protection valve inside the outdoor unit possible, the vacuuum breaker must be installed correctly:

- Directly at the water outlet of the unit, without any field piping or valve in between.
- Head-up for air supply.

Possibility 1 	With option EKBALLV1 (shut-off valves with integrated connection for the vacuum breaker). For installation instructions, see the installation manual of the shut-off valves.
Possibility 2 	With T-joint (field supply) + shut-off valve (field supply). 

9.6.6 To fill the space heating circuit

In case of dedicated gas boiler

INFORMATION

Air purge valves. In case of NHY2KOMB28+32AA gas boiler, the following air purge valves are possible:

- Manual air purges valves on the shut-off valves (option EKBALLV1).
- Manual air purge valve inside the NHY2KOMB28+32AA gas boiler.
- Manual or automatic field-supplied air purge valves.
- **Note:** Automatic air purge valves are NOT allowed if glycol is used.

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 fill/drain point.

Note: The fill/drain point can be:
- Field supplied
- Part of option EKFL1A (filling loop kit for the NHY2KOMB28+32AA gas boiler)

3 Power up the gas boiler to see the pressure indication on the boiler display.

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

5 Fill the circuit with water until the boiler display indicates a pressure of ±2 bar (with a minimum of 0.5 bar).

Note: The pressure relief valve of the outdoor unit is designed to open at 3 bar.

6 Purge air from all manual air purge valves in the system (open, purge air, close).

7 Check the pressure. If it is too low, repeat from step 5.

8 Turn ON the pump, and check if you can still hear air in the circuit. After ±1 min, turn it OFF.

Note: To turn the pump ON and OFF, use the air purge function on the outdoor unit's user interface. See "12.4.1 Air purge function" on page 79.

9 Purge air again from all manual air purge valves in the system (especially if you heard air in the circuit).

10 Check the pressure again. If it is too low, repeat from step 5.

11 Disconnect the water supply hose from the fill/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.

In case of third-party gas boiler

INFORMATION

Air purge valves. In case of third-party gas boiler, the following air purge valves are possible:

- Manual air purge valves on the shut-off valves (option EKBALLV1).
- Manual or automatic air purge valve inside the third-party gas boiler.
- Manual or automatic field-supplied air purge valves.
- **Note:** Automatic air purge valves are NOT allowed if glycol is used.

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 fill/drain point.

Note: The fill/drain point can be:
- Field supplied
- Part of the existing installation

3 Power up the gas boiler, and make sure you can read out the pressure indication.

Note: The pressure indication can be:
- On the boiler display of the third-party gas boiler
- On a field-supplied manometer

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

5 Fill the circuit with water until the boiler display indicates a pressure of ±2 bar (with a minimum of 0.5 bar).

Note: The pressure relief valve of the outdoor unit is designed to open at 3 bar.

6 Purge air from all manual air purge valves in the system (open, purge air, close).

7 Check the pressure. If it is too low, repeat from step 5.

8 Turn ON the pump, and check if you can still hear air in the circuit. After ±1 min, turn it OFF.

Note: To turn the pump ON and OFF, use the air purge function on the outdoor unit's user interface. See "12.4.1 Air purge function" on page 79.

9 Turn ON the bivalent signal test, and check if you can still hear air in the circuit. After ±1 min, turn it OFF.

Note: To turn the bivalent signal test, see "12.4.3 To perform an actuator test run" on page 80.

10 Purge air again from all manual air purge valves in the system (especially if you heard air in the circuit).

11 Check the pressure again. If it is too low, repeat from step 5.

12 Disconnect the water supply hose from the fill/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.

9.6.7 To fill the domestic water circuit of the gas boiler

1 Open the main tap to pressurize 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.

9.6.8 To fill the domestic hot water tank

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

9.6.9 To insulate the water piping

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

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

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

9.7 Connecting the electrical wiring

9.7.1 About connecting the electrical wiring

Before connecting the electrical wiring

Make sure the water piping is connected.

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

Typical workflow in case of dedicated gas boiler

Connections to **outdoor unit**:

1 Making sure the power supply system complies with the electrical specifications of the units.
2 Connecting the electrical wiring to the outdoor unit.
3 Connecting the main power supply.
4 Connecting the user interface.
5 Connecting the dedicated gas boiler to the outdoor unit.
6 Connecting the domestic hot water pump (if applicable).
7 Connecting the bottom plate heater (if applicable)(see the installation manual of the bottom plate heater).
8 Connecting the remote outdoor sensor (if applicable)(see the installation manual of the remote outdoor sensor and addendum book for optional equipment).
9 Connecting the LAN adapter (if applicable)(see the installation manual of the LAN adapter and addendum book for optional equipment).

Connections to NHY2KOMB28+32AA **gas boiler**:

10 Connecting the main power supply to the gas boiler.
11 Connecting the wired or wireless room thermostat (if applicable) (see the installation manual of the room thermostat and addendum book for optional equipment).
12 Connecting the heat pump convector (if applicable)(see the installation manual of the heat pump convector and addendum book for optional equipment).
13 Connecting the domestic hot water tank (if applicable)(see the installation manual of the DHW tank and addendum book for optional equipment).

Typical workflow in case of third-party gas boiler

Connections to **outdoor unit**:

1 Making sure the power supply system complies with the electrical specifications of the units.
2 Connecting the electrical wiring to the outdoor unit.
3 Connecting the main power supply.
4 Connecting the user interface.
5 Connecting the bivalent signal for third-party gas boiler.
6 Connecting the external pump.
7 Connecting the bottom plate heater (if applicable)(see the installation manual of the bottom plate heater).

9.7.2 Precautions when connecting the electrical wiring

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

DANGER: RISK OF ELECTROCUTION

WARNING

ALWAYS use multicore cable for power supply cables.

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.

NOTICE

Safety thermostat (normally closed contact). The outdoor unit does not contain a safety thermostat. Make sure to install a field-supplied safety thermostat in the heat emitter system according to the applicable legislation.

However, you cannot connect the feedback signal from the safety thermostat to the outdoor unit or gas boiler because there are no terminals for the feedback signal. Because of this, you also do not have to do any configuration on the outdoor unit or gas boiler.

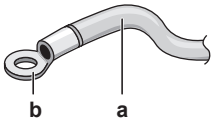
In any case, to prevent unnecessary tripping of the safety thermostat, we recommend the following:

- 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.

9.7.3 Guidelines when connecting the electrical wiring

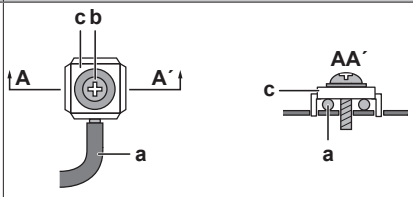
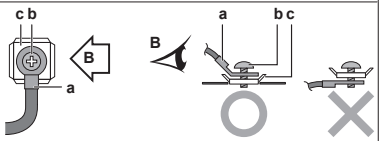
Keep the following in mind:

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



a Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

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

Item	Tightening torque (N•m)
Outdoor unit	
X2M	1.3~1.6
X5M	0.8~0.9

9.7.4 In case of dedicated gas boiler

To connect the electrical wiring on the outdoor unit

NOTICE

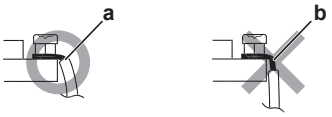
The distance between the high voltage and low voltage cables should be at least 50 mm.

CAUTION

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

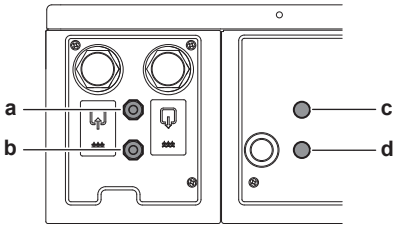
1 Open the top plate and the front plate. See "9.2.2 To open the outdoor unit" on page 30.

2 Strip insulation (20 mm) from the wires.



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

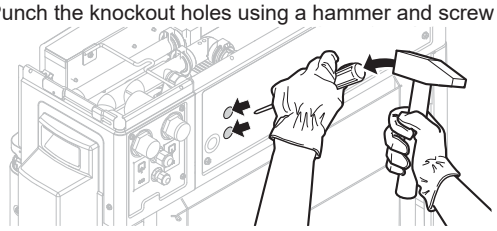
3 Insert the wiring at the back of the unit:



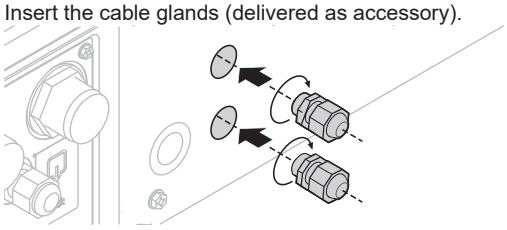
a~d See below

4 If you insert cables through the knockout holes **c** and **d**:

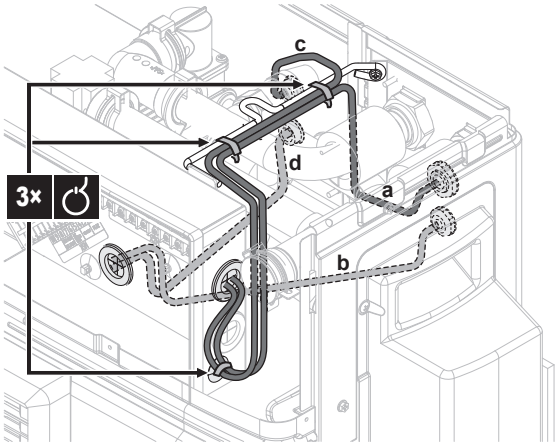
- Punch the knockout holes using a hammer and screw driver.



- Insert the cable glands (delivered as accessory).



5 Inside the unit, route the wiring to the switch box as follows:



a~d See below

6 Inside the switch box, connect the wires to the appropriate terminals.

7 After connecting all wiring, close the front plate and the top plate.

Connections in case of dedicated gas boiler

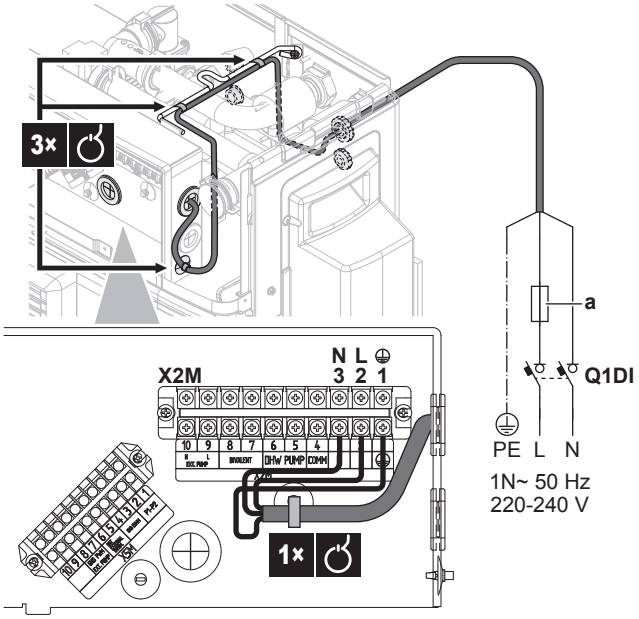
Routing	Possible cables (depends on the installed options)
a Main power supply (high voltage)	Main power supply
b User interface (low voltage)	User interface (mandatory option)
c High voltage	Domestic hot water pump (field supply)
d Low voltage	▪ Interconnection cable between outdoor unit and gas boiler ▪ External outdoor temperature sensor (option) ▪ LAN adapter (option)

INFORMATION

Bottom plate heater (option). For the routing, see the installation manual of the bottom plate heater.

To connect the main power supply

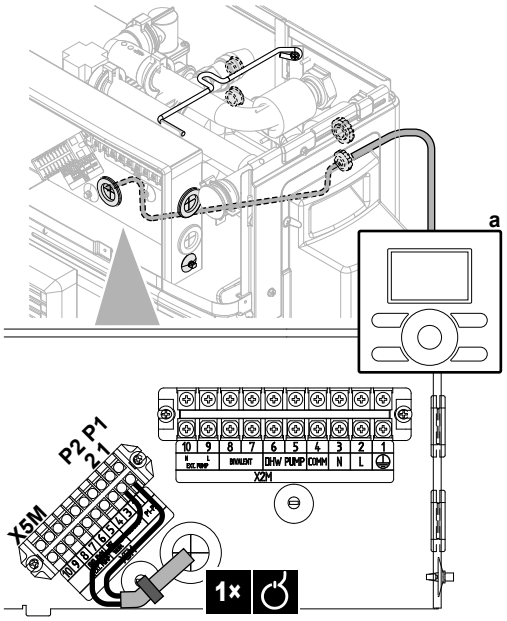
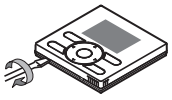
1 Connect the main power supply to the appropriate terminals as shown in the illustration below.



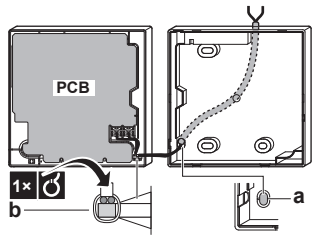
a Recommended field fuse: 20 A
Q1DI Earth leakage circuit breaker

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

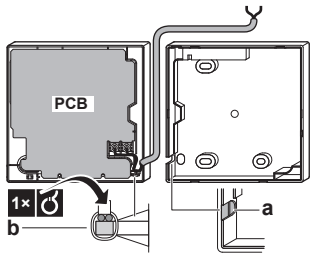
To connect the user interface

#	Action
1	Connect the user interface cable to the outdoor unit. Fix the cable with cable ties to the cable tie mountings.  **a** User interface. The user interface is required for operation, but has to be ordered separately (mandatory option).
2	Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate. The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it. 
3	Fix the wallplate of the user interface to the wall.
4	Connect as shown in 4A, 4B, 4C or 4D.
5	Reinstall the faceplate onto the wallplate. Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

4A From the rear

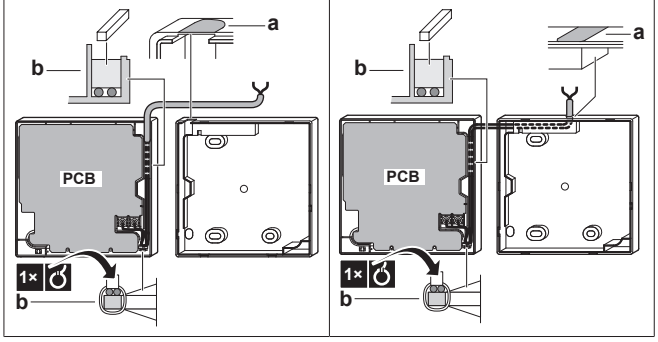


4B From the left



4C From the top

4D From the top centre

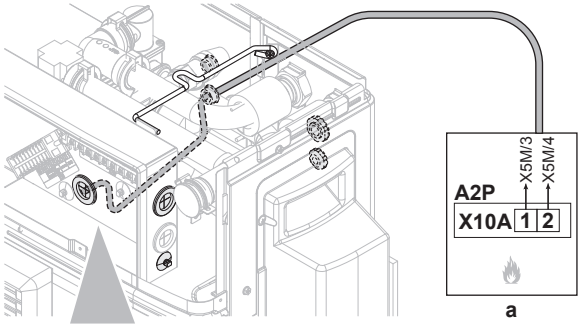


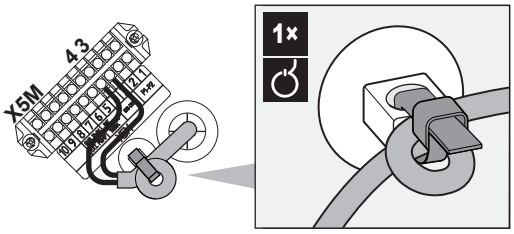
a Notch this part for the wiring to pass through with nippers etc.

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

To connect the dedicated gas boiler to the outdoor unit

1 Connect the interconnection cable between outdoor unit and gas boiler to the appropriate terminals as shown in the illustration below. The interconnection cable is field supplied.



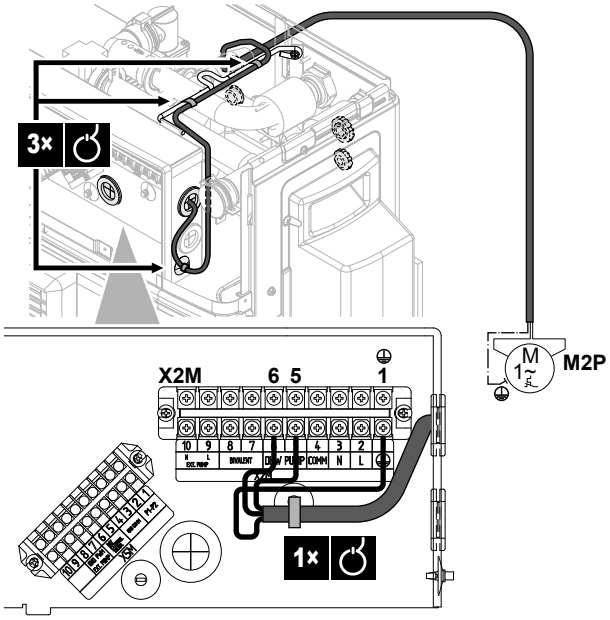


a NHY2KOMB28+32AA gas boiler

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

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.



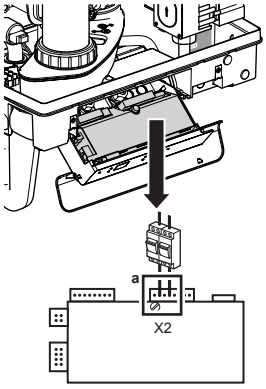
2 Fix the cable with cable ties to the cable tie mountings.

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. 2 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

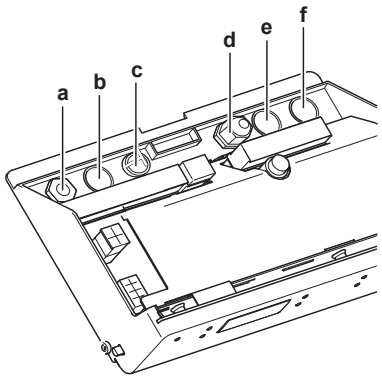
For installation in damp rooms, a fixed connection is obligatory. When working on the electrical circuit ALWAYS isolate the electric supply.

To connect the electrical wiring to the gas boiler

1 Open the gas boiler.

2 Open the switch box cover of the gas boiler.

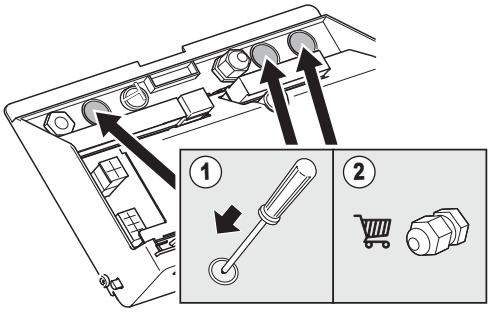
3 Enter the wiring through the bottom of the unit.



Part		Description	
Low voltage	a	Interconnection cable between outdoor unit and gas boiler (current loop PCB)(*)	Factory-mounted cable gland
	b	Domestic hot water tank thermistor	Knockout hole
	c	Room thermostat or heat pump convector	Rubber grommet
High voltage	d	Power supply	Factory-mounted cable gland
	e + f	3-way valve	Knockout hole

(*) For more information on the current loop installation, read the manual in the accessory bag of the current loop.

4 If needed, remove the knock-out holes with a screwdriver and attach the field supplied glands.



5 Connect the wiring to the appropriate terminals. See "17.2.2 Wiring diagram: Gas boiler" on page 99.

6 Close the switch box cover of the gas boiler.

7 Close the gas boiler.

9.7.5 In case of third-party gas boiler

To connect the electrical wiring on the outdoor unit

NOTICE

The distance between the high voltage and low voltage cables should be at least 50 mm.

CAUTION

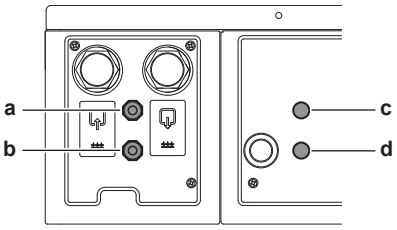
Do NOT push or place redundant cable length in the unit.

1 Open the top plate and the front plate. See "9.2.2 To open the outdoor unit" on page 30.

2 Strip insulation (20 mm) from the wires.

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

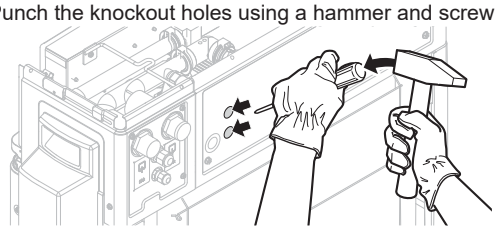
3 Insert the wiring at the back of the unit:



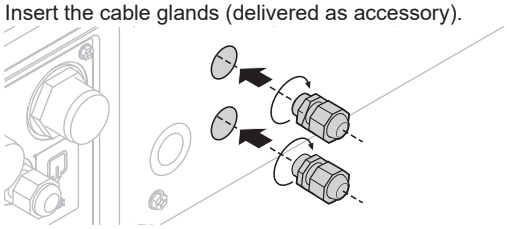
a~d See below

4 If you insert cables through the knockout holes **c** and **d**:

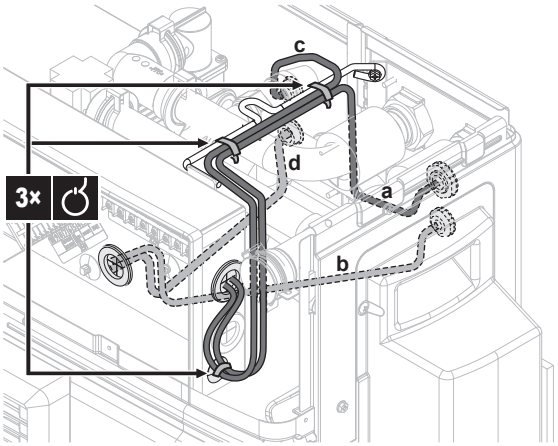
- Punch the knockout holes using a hammer and screw driver.



- Insert the cable glands (delivered as accessory).



5 Inside the unit, route the wiring to the switch box as follows:



a~d See below

6 Inside the switch box, connect the wires to the appropriate terminals.

7 After connecting all wiring, close the front plate and the top plate.

Connections in case of third-party gas boiler

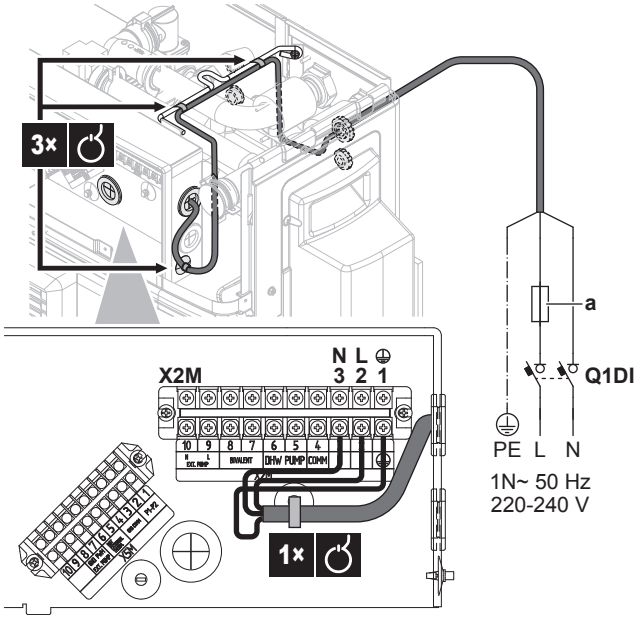
Routing	Possible cables (depends on the installed options)
a Main power supply (high voltage)	Main power supply
b User interface (low voltage)	User interface (mandatory option)
c High voltage	▪ Bivalent signal for third-party gas boiler (field supply) ▪ External pump cable – Power supply (mandatory option)
d Low voltage	▪ External outdoor temperature sensor (option) ▪ LAN adapter (option) ▪ External pump cable – PWM signal (mandatory option)

INFORMATION

Bottom plate heater (option). For the routing, see the installation manual of the bottom plate heater.

To connect the main power supply

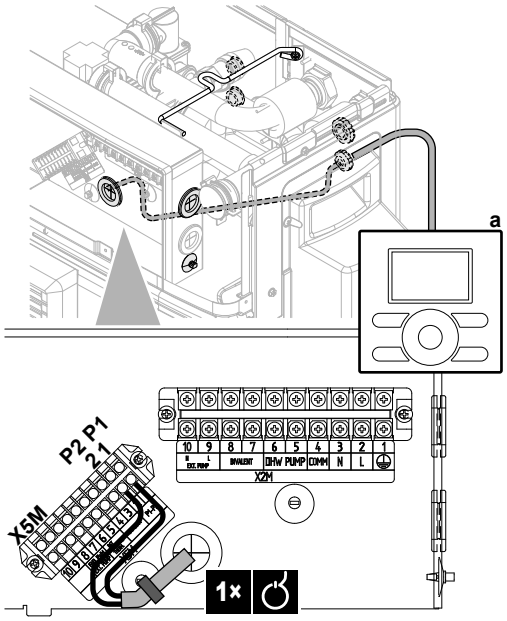
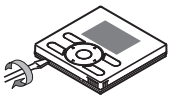
1 Connect the main power supply to the appropriate terminals as shown in the illustration below.



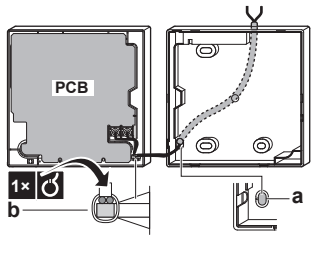
a Recommended field fuse: 20 A
Q1DI Earth leakage circuit breaker

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

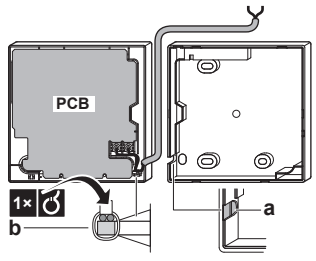
To connect the user interface

#	Action
1	Connect the user interface cable to the outdoor unit. Fix the cable with cable ties to the cable tie mountings.  **a** User interface. The user interface is required for operation, but has to be ordered separately (mandatory option).
2	Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate. The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it. 
3	Fix the wallplate of the user interface to the wall.
4	Connect as shown in 4A, 4B, 4C or 4D.
5	Reinstall the faceplate onto the wallplate. Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

4A From the rear

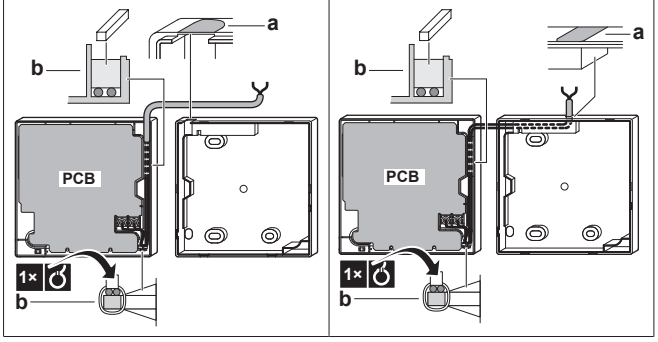


4B From the left



4C From the top

4D From the top centre

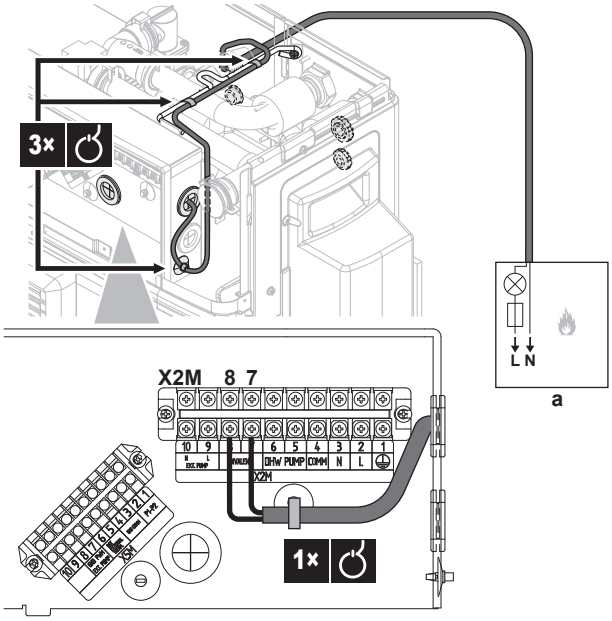


a Notch this part for the wiring to pass through with nippers etc.

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

To connect the bivalent signal for third-party gas boiler

1 Connect the bivalent signal for third-party gas boiler to the appropriate terminals as shown in the illustration below.



a Bivalent signal for third-party gas boiler

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

To connect the external pump

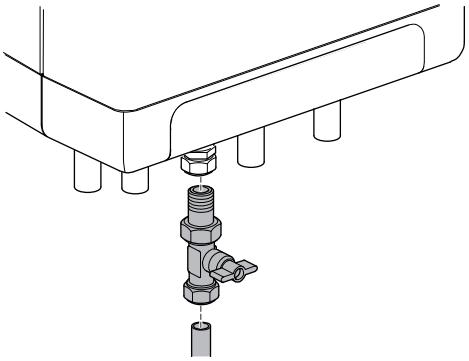
NOTICE

External pump. In case of third-party gas boiler, you must install the mandatory options EKADDONJH and EKADDONJH2 (= connection kit for third-party gas boiler). This includes connecting the external pump to the outdoor unit. For installation instructions, see the installation manual of the connection kit.

9.8 Connecting the gas piping

9.8.1 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_2O). There may be no stress on the gas supply connection.

9.9 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.
- 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.

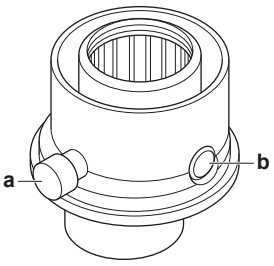
The gas boiler is delivered with a 60/100 concentric flue gas/air intake connection. Fit the concentric pipe carefully in the adapter. The built-in gaskets ensure there is an air tight seal.

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.

9.9.1 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.

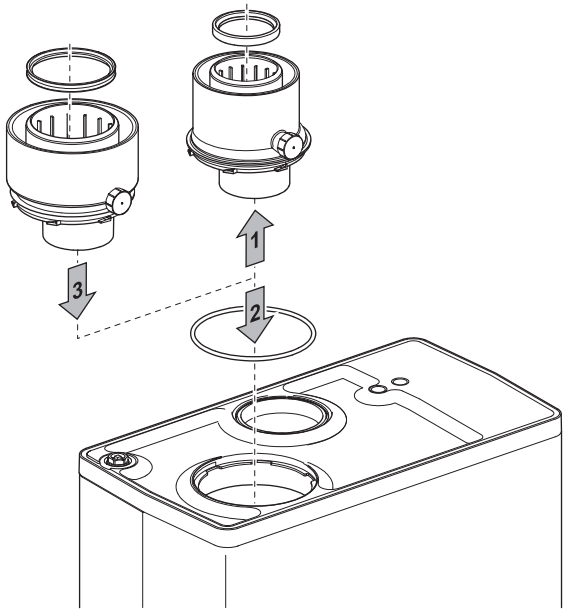
1 Remove the concentric pipe from the air supply and combustion gas pipe at the top of the gas boiler by turning counterclockwise.

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.



9.9.2 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 2× 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.

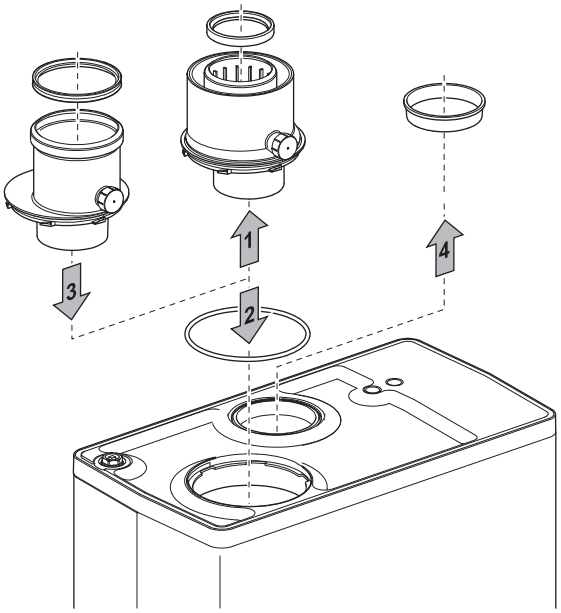
2 Remove the O-ring from the concentric pipe and fit it around the flange of the dual pipe adapter Ø80.

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. Room air dependent installation is NOT allowed.

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.

9.9.3 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,…).

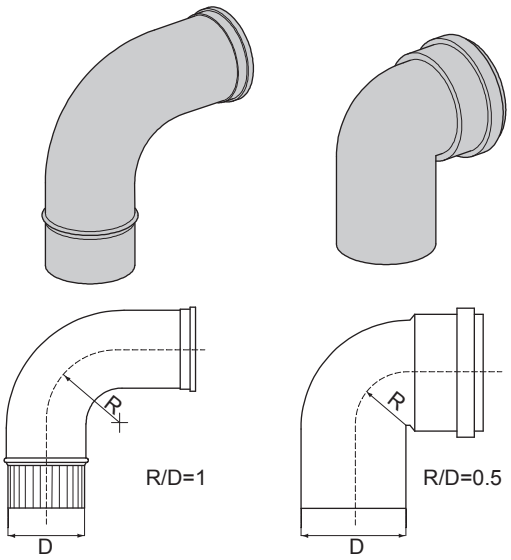
The total permitted pipe length of the air supply and the combustion gas flue is indicated for each appliance category.

Equivalent length for concentric installation (60/100)

	Length (m)
Bend 90°	1.5
Bend 45°	1

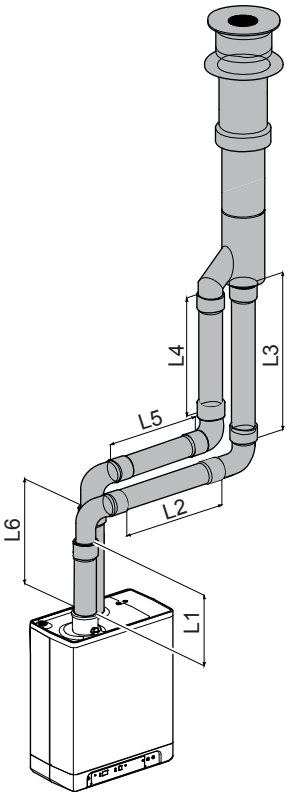
Equivalent length for dual pipe installation

		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+(2×2) m	13 m
Air supply	L4+L5+L6+(2×2) m	12 m

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

9.9.4 Appliance categories and pipe lengths

Following installation methods are supported by the manufacturer.

Single boiler installation

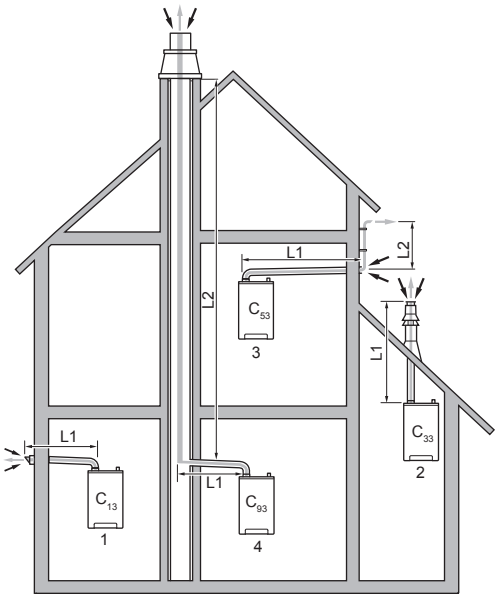
Please note that NOT all flue gas configurations as described below are allowed in all countries. Please follow the local and national regulations.

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		
B_{23}	A flue that evacuates the products of combustion to the outside of the room containing the appliance. The combustion air is drawn directly from the room.	Make sure the air inlet is open and complies to the demands.
B_{33}	A flue system which is connected to a common duct system. This common duct system consists of a single natural draught flue. All pressurized parts of the appliance containing products of combustion are completely enclosed by parts of the appliance supplying combustion air. Combustion air is drawn into the appliance from the room by means of a concentric duct, which encloses the flue. The air enters through defined orifices situated in the surface of the duct.	Make sure the air inlet is open and complies to the demands.
C_{13}	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_{33}	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_{43}	Joint air supply and flue gas discharge duct (CLV system). Twin pipe or concentric.	—
C_{53}	Separate air supply and separate flue gas discharge duct. Discharge into different pressure zones.	—
C_{63}	Free in the market available flue material with CE approval.	Do NOT mix flue materials from different suppliers.
C_{83}	Joint air supply and flue gas discharge duct (CLV system). Discharging into different pressure zones.	Only as twin pipe system.
C_{93}	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.

Permitted pipe lengths B_{23} and B_{33} Ø80 mm:

	B_{23}	B_{33}
NHY2KOMB28AA	85 m	85 m
NHY2KOMB32AA	80 m	80 m

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.

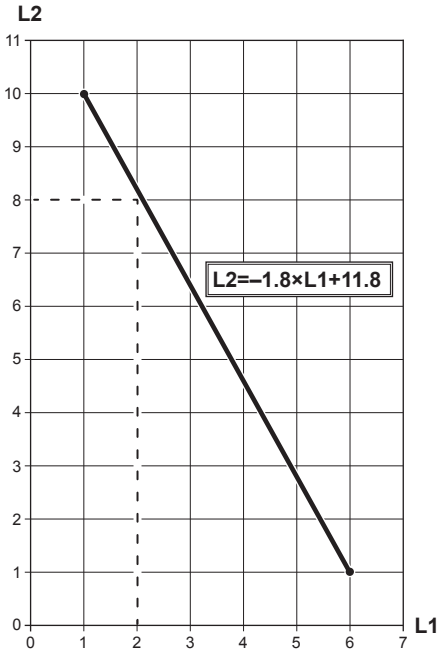
INFORMATION

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

C_{13} (1)	C_{33} (2)	C_{13} (1)	C_{33} (2)
60/100	**60/100**	**Twin-80**	**Twin-80**
L1 (m)	**L1 (m)**	**L1 (m)**	**L1 (m)**
10	10	80	21

C_{13} (1)	C_{33} (2)	C_{93} (4)		C_{53} (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

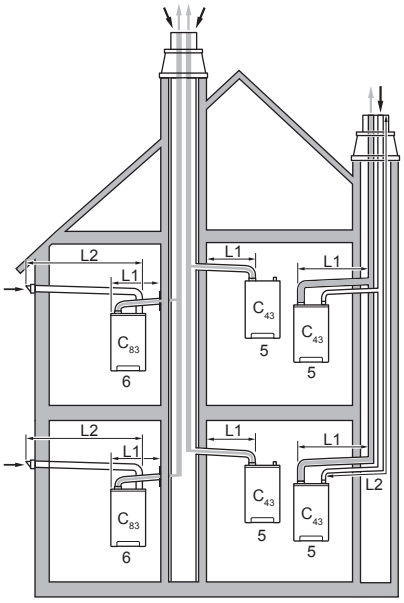
Special remark regarding C_{53}: The maximum lengths for L1 and L2 are related to each other. First determine the length of L1; then make use of the graph below to determine the maximum length of L2. For example: if the length of L1 is 2 m, L2 can maximally be 8 m long.



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.

C_{83} (6)	C_{43} (5)		
Twin-80	60/100	80/125	Twin-80
L1+L2 (m)	L1 (m)	L1 (m)	L1+L2 (m)
80	10	29	80

Special remark regarding C_{83}: See the table below for the minimum diameters of the combined gas exhaust system.

Number of units	Minimum Ø
2	130
3	150
4	180
5	200
6	220
7	230
8	250
9	270
10	280
11	290
12	300

Special remark regarding C_{43}: See the table below for the minimum diameters of the combined gas exhaust/air intake system.

For NHY2KOMB28AA:

Number of units	Concentric		Dual pipe	
	Gas exhaust	Air intake	Gas exhaust	Air intake
2	135	253	135	214
3	157	295	157	249
4	166	311	166	263
5	175	328	175	278
6	184	345	184	292
7	193	362	193	306
8	201	376	201	318
9	210	393	210	332
10	219	410	219	347
11	228	427	228	361
12	237	444	237	375
13	246	461	246	389
14	255	478	255	404
15	264	494	264	418
16	272	509	272	431
17	281	526	281	445
18	290	543	290	459
19	299	560	299	473
20	308	577	308	488

For NHY2KOMB32AA:

Number of units	Concentric		Dual pipe	
	Gas exhaust	Air intake	Gas exhaust	Air intake
2	155	291	155	246

Number of units	Concentric		Dual pipe	
	Gas exhaust	Air intake	Gas exhaust	Air intake
3	166	311	166	263
4	176	330	176	279
5	186	349	186	295
6	196	367	196	311
7	206	386	206	326
8	216	404	216	342
9	226	423	226	358
10	236	442	236	374
11	247	463	247	391
12	257	482	257	407
13	267	500	267	423
14	277	519	277	439
15	287	538	287	454
16	297	556	297	470
17	307	575	307	486
18	317	594	317	502
19	328	614	328	519
20	338	633	338	535

Special remark regarding C_{93}: The minimum inner dimensions of the chimney have to be 200×200 mm.

9.9.5 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_{13}	Daikin																							
C_{33}	Daikin																							
C_{43}	Daikin																							
C_{53}	Daikin																							
C_{63}	(a)											(b)	(a)	(b)								(a)		(b)
C_{83}	Daikin																							
C_{93}	Daikin																							

(a) Gas exhaust/air intake parts can be bought from the 3rd party. All parts purchased from an external supplier MUST comply with EN14471.
(b) NOT allowed.

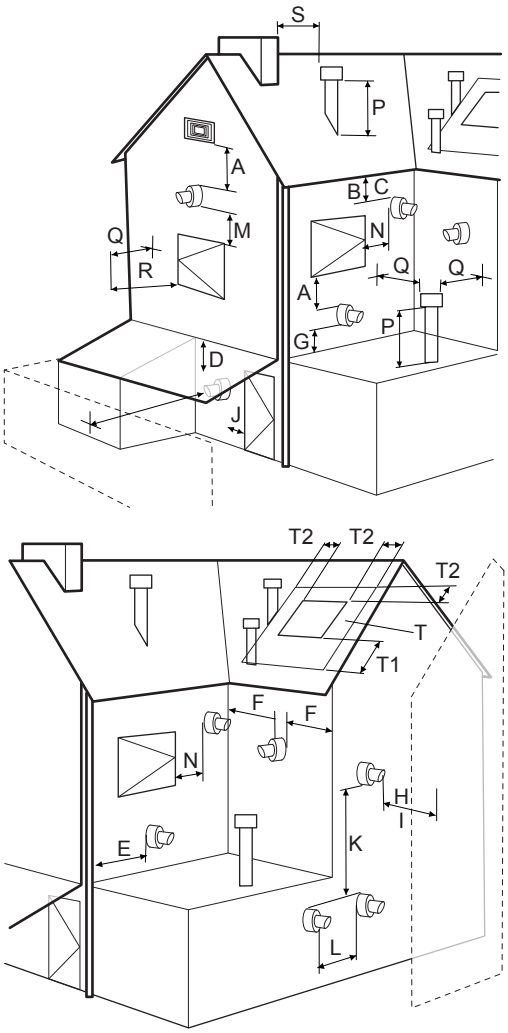
9.9.6 Flue pipe position

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 "6.3 Combining units and options" on page 13.



	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

	Terminal position	Minimum distance (mm)
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 T1 T2	Terminals adjacent to windows or openings on pitched and flat roofs: The flue should NOT penetrate this area.	 2000 600

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.

9.9.7 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.

9.9.8 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.

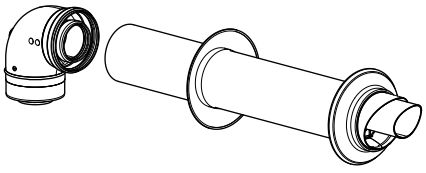
CAUTION

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.

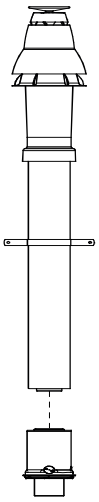


9.9.9 Fitting a vertical flue system

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.



9.9.10 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.

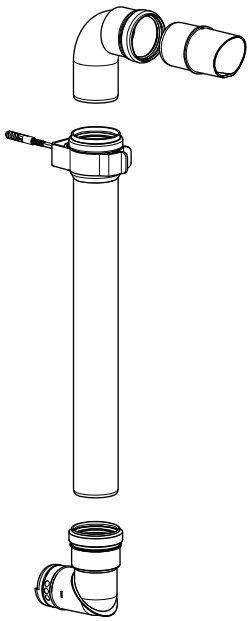
NOTICE

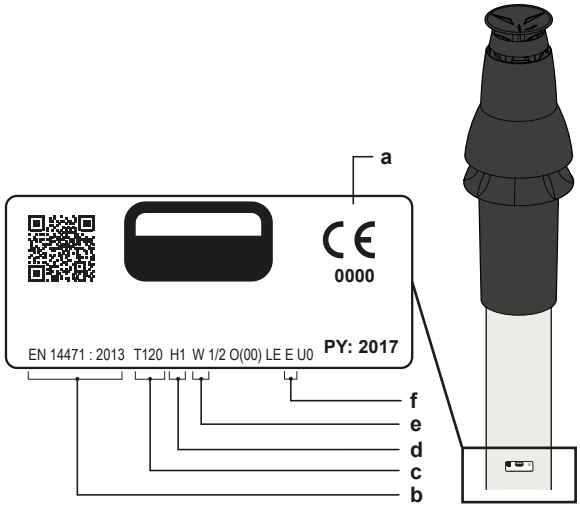
For each additional 90° elbow used the maximum flue length MUST be reduced by 1.5 m whilst the use of 2× 45° bends warrants a reduction of 2 m.

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.





a CE marking
b In case of metal, the standard must comply to EN 1856-2.
In case of plastic, the standard must comply to EN 14471

The identification string needs to contain the following information:

c Temperature class: T120
d Pressure class: Pressure (P) or high pressure (Hi)
e Resistance class: Wet (W)
f Resistance class in case of fire: E

9.9.11 Flues in voids

Especially for UK:

The flue system must be connected in accordance with the manufacturers 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.

9.9.12 Flue gas materials (C63) available on the market

The properties of the combustion determine the choices for the flue material. The standards EN 1443 and EN 1856-1 provide the necessary information for choosing the flow material by means of a sticker including an identification string. The identification string contains the following information:

Dimensions C63 of the flue system (external dimensions in mm)

Parallel	Concentric 80/125		Concentric 60/100	
	Flue pipe	Air inlet	Flue pipe	Air inlet
Ø80 (+0.3 / –0.7)	Ø80 (+0.3 / –0.7)	Ø125 (+2 / –0)	Ø60 (+0.3 / –0.7)	Ø100 (+2 / –0)

WARNING

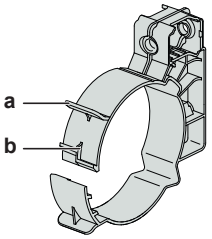
Flue materials of different markings must NOT be combined.

9.9.13 About securing the flue system

CAUTION

- These regulations are typical for both concentric and parallel flue systems.
- The flue system MUST be secured to a solid structure.
- The flue system should have a continuous fall back to the boiler (1.5°~3°). 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 are ≤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.

Which fixation position to use



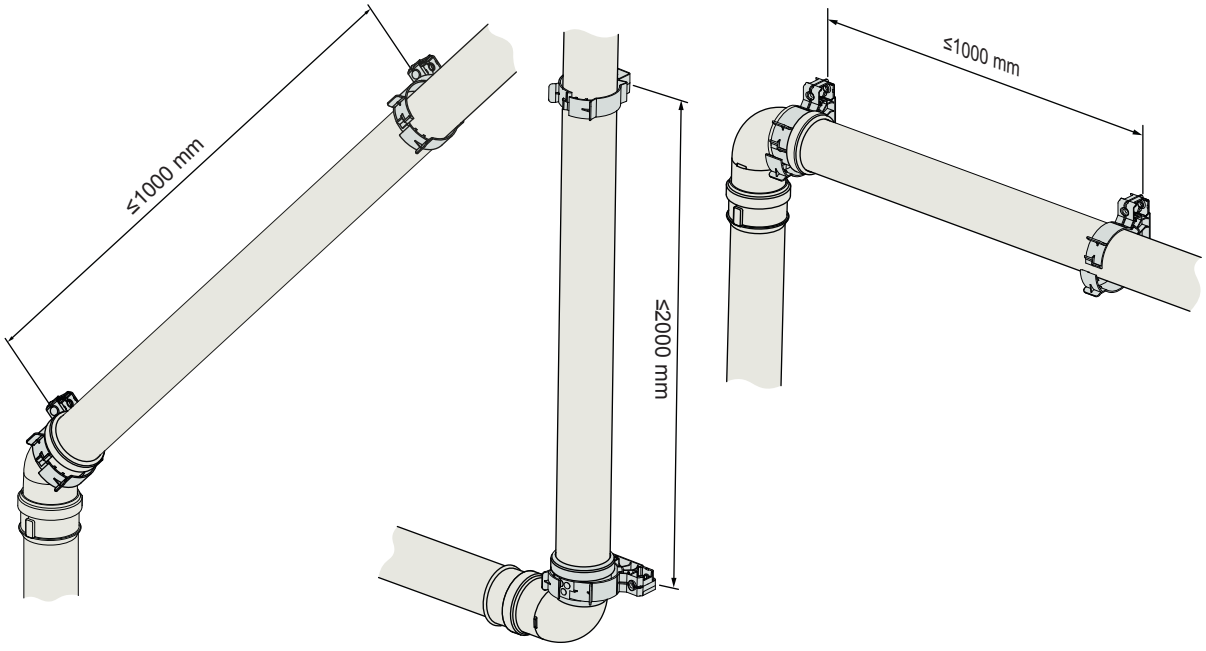
a In case to fix on the pipe

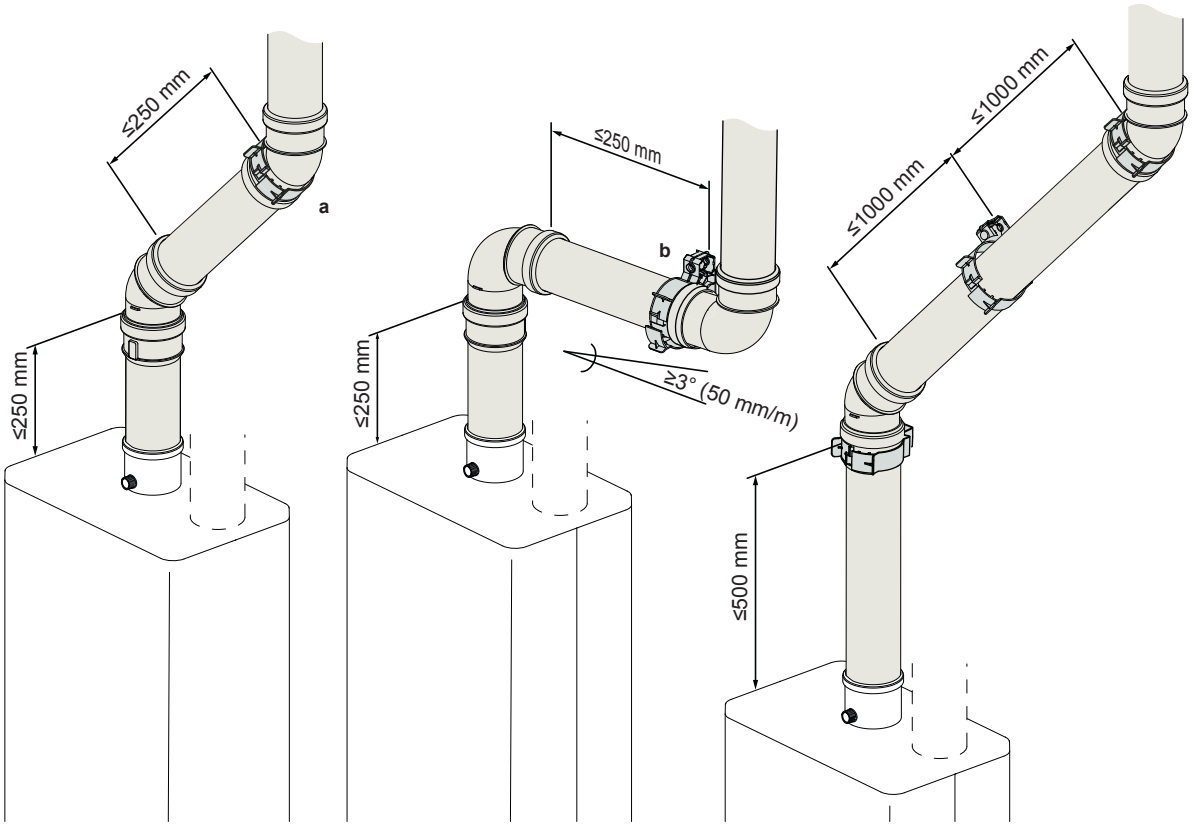
b In case to fix on the sleeve

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.





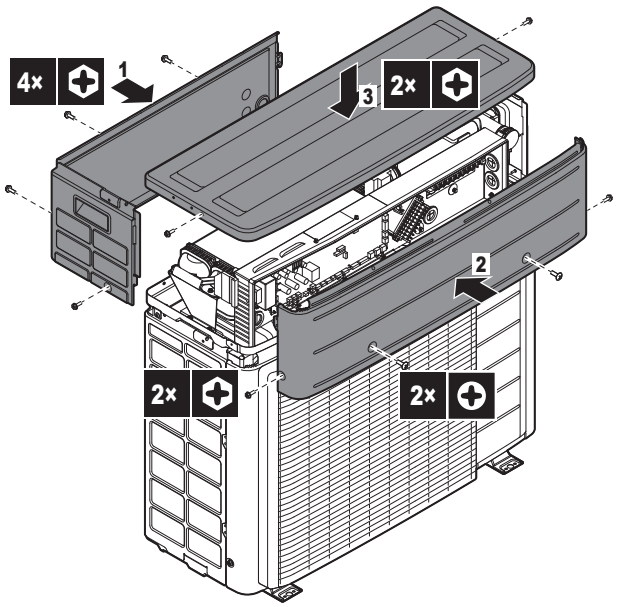
A Second clamp after the second elbow
B First clamp after the second elbow

9.10 Finishing the outdoor unit installation

9.10.1 To close the outdoor unit

NOTICE

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

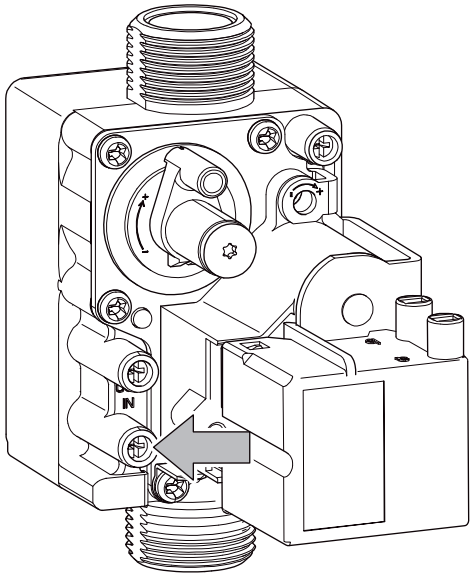


1 Reattach the rear plate.
2 Reattach the front plate.
3 Reattach the top plate.

9.11 Finishing the gas boiler installation

9.11.1 To perform an air purge on the gas supply

1 Turn once the screw counterclockwise.



Result: Gas supply will purge air.

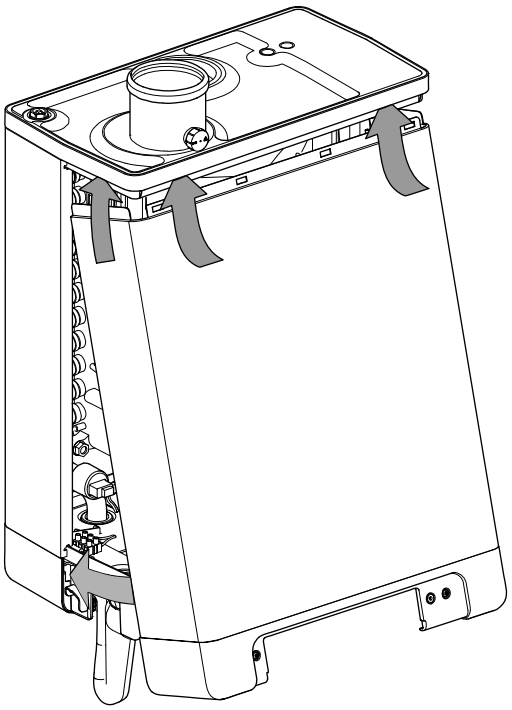
2 Check all connections for leakage.
3 Check the gas supply pressure.

INFORMATION

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

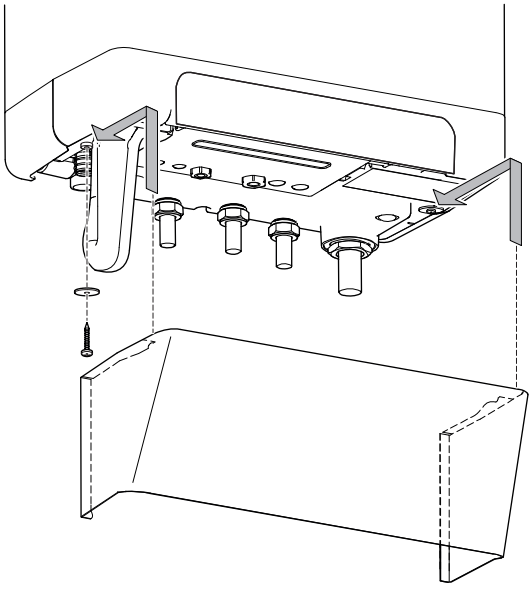
9.11.2 To close the gas boiler

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.

9.11.3 To install the cover plate



The boiler cover plate is an optional product.

10 Configuration

10.1 Outdoor unit

10.1.1 Overview: Configuration

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

INFORMATION

Gas boiler. Depending on the installed gas boiler, settings will be visible/invisible.

- By default, only the settings applicable for the third-party gas boiler are displayed.
- When the unit detects communication from the NHY2KOMB28+32AA gas boiler, all settings applicable for the NHY2KOMB28+32AA gas boiler are automatically displayed.

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 via the user interface.

- **First time – Quick wizard.** When you turn ON the user interface for the first time (via the outdoor unit), a quick wizard starts to help you configure the system.
- **Afterwards.** If necessary, you can make changes to the configuration afterwards.

INFORMATION

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

Accessing settings – Legend for tables

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

Method	Column in tables
Accessing settings via the breadcrumb in the **menu structure**.	**#** For example: [A.2.1.7]
Accessing settings via the code in the **overview settings**.	**Code** For example: [C-07]

See also:

- "To access the installer settings" on page 56
- "10.1.5 Menu structure: Overview installer settings" on page 71

To access the most used commands

To access the installer settings

1 Set the user permission level to `Installer`.

2 Go to [A]: > `Installer settings`.

To access the overview settings

1 Set the user permission level to `Installer`.

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

To set the user permission level to Installer

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

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

3 Press for more than 4 seconds.

Result: is displayed on the home pages.

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

To set the user permission level to Advanced end user

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

2 Press for more than 4 seconds.

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

To set the user permission level to End user

1 Press for more than 4 seconds.

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

To modify an overview setting

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

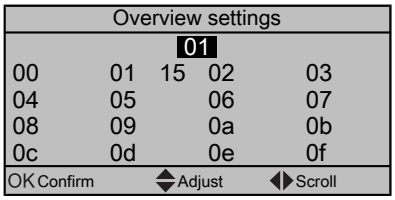
1 Go to [A.8]: > `Installer settings` > `Overview settings`.

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

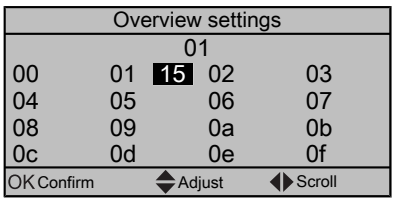
INFORMATION

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

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

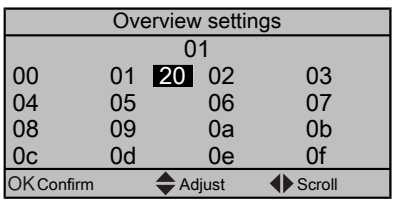


3 Go to the corresponding second part of the setting by using the and button.



Result: The value to be modified is now highlighted.

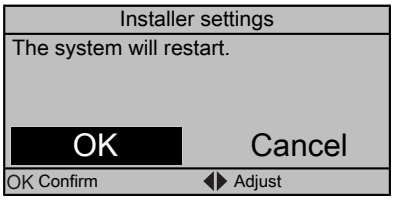
4 Modify the value by using the and button.



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

6 Push OK to confirm the modification of the parameter.

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



Result: The system will restart.

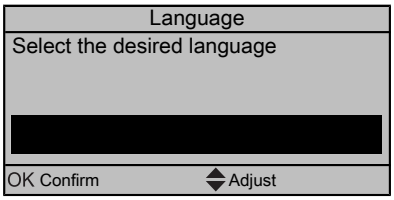
Quick wizard: Set the system layout after first power ON

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

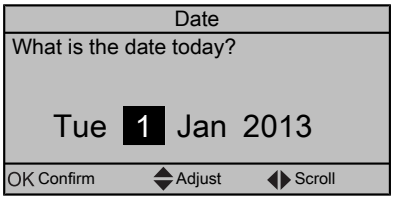
- language,
- date,
- time,
- system layout.

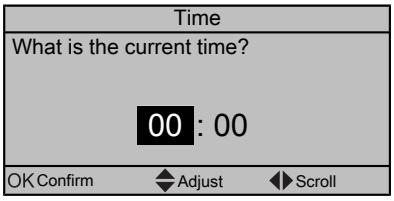
By confirming the system layout, you can proceed with the installation and commissioning of the system.

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

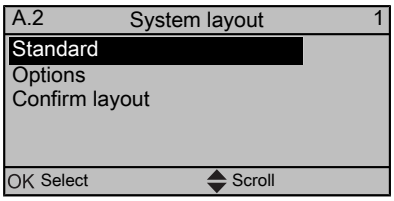


2 Set the current date and time.

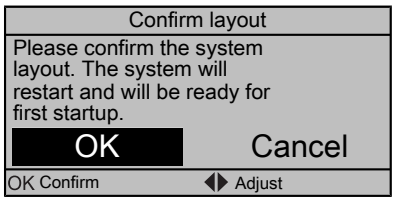




3 Set the system layout settings: `Standard`, `Options`. For more details, see "10.1.2 Basic configuration" on page 57.



4 After configuration, select `Confirm layout` and press OK.



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

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

10.1.2 Basic configuration

Quick wizard: Language / time and date

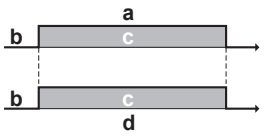
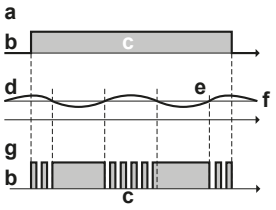
#	Code	Description
[A.1]	N/A	Language
[1]	N/A	Time and date

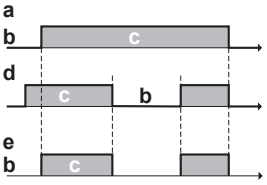
Quick wizard: Standard

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]	Unit temperature control: ▪ 0 (`LWT control`): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating demand of the room. ▪ 1 (`Ext RT control`): Unit operation is decided by the external thermostat or equivalent (e.g. heat pump convector). This is only applicable in case of NHY2KOMB28+32AA gas boiler. ▪ 2 (`RT control`): Unit operation is decided based on the ambient temperature of the user interface.

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

#	Code	Description
[A.2.1.9]	[F-0D]	<< continuation ▪ 2 (`Request`): Pump operation based on request. **Example:** Using a room thermostat creates thermo ON/OFF condition. When there is no such demand, the pump is OFF. **Remark:** Request is NOT available in leaving water temperature control.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: ON ▪ d: Heating demand (by ext RT or RT) ▪ e: Pump operation
[A.2.1.C]	[E-0D]	`Glycol present`: ▪ 0 (`No`): No glycol was added to the water circuit. ▪ 1 (`Yes`): Glycol was added to the water circuit to protect it against freezing.
[A.2.1.E]	[C-02]	`Hybrid system type`: ▪ 0 (`Boiler`): In case of NHY2KOMB28+32AA gas boiler. ▪ 1 (`Bivalent boiler`): In case of third-party gas boiler. By default, this setting is set to 1, and only the settings applicable for the third-party gas boiler are displayed. When the unit detects communication from the NHY2KOMB28+32AA gas boiler, the unit automatically changes this setting to 0, and all settings applicable for the NHY2KOMB28+32AA gas boiler are displayed.

Quick wizard: Options

Domestic hot water settings

Only applicable in case of NHY2KOMB28+32AA gas boiler. Following settings must be made accordingly.

#	Code	Description
[A.2.2.1]	[E-05]	Domestic hot water preparation: ▪ 0 (`No`): NOT possible ▪ 1 (`Yes`): Possible
[A.2.2.2]	[E-06]	Domestic hot water tank installed in the system? ▪ 0 (`No`): the domestic hot water will be produced by the boiler when there is a demand. ▪ 1 (`Yes`): the domestic hot water will be produced by the tank. **Note:** For Switzerland, setting MUST be "1".

#	Code	Description
[A.2.2.3]	[E-07]	Domestic hot water tank: ▪ 0 (Type 1): EKHWS*D* or third-party tank (see below). ▪ 4 (Type 5). EKHWP. ▪ 6 (Type 7) Third-party tank. Range: 0~6
[A.2.2.A]	[D-02]	In case a tank is installed, the outdoor unit offers the possibility to connect a field supplied domestic hot water pump (On/OFF type). Depending on the installation and configuration on the user interface, we distinguish its functionality. Not applicable for Switzerland. In case of [E-06]=1 ▪ 0 (No): NOT installed ▪ 1 (Secondary rtrn): Installed for instant hot water when water is tapped. The end-user sets the operation timing (weekly schedule time) of the domestic hot water pump when it should run. Control of this pump is possible through the outdoor unit. ▪ 2 (Disinf. shunt): Installed for disinfection. It runs when the disinfection function of the domestic hot water function is running. No further settings are needed. See also illustrations below.

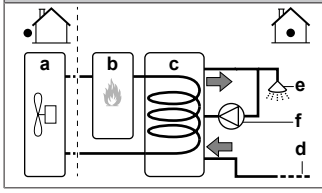
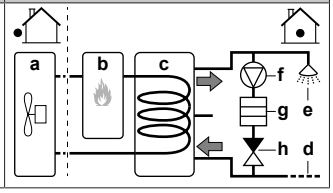
INFORMATION

The tank can be heated via the gas boiler or heat pump.

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]=1

Domestic hot water pump installed for…	
Instant hot water	Disinfection
	

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

INFORMATION

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

Thermostats and external sensors

External room thermostat control is only applicable in case of NHY2KOMB28+32AA gas boiler.

#	Code	Description
[A.2.2.4]	[C-05]	Contact type main In external room thermostat control, the contact type of the optional room thermostat or heat pump convector for the main leaving water temperature zone must be set. See "7 Application guidelines" on page 17. ▪ 1 (Thermo ON/OFF): The connected external room thermostat or heat pump convector sends the heating demand to the NHY2KOMB28+32AA gas boiler (X4/6). Select this value in case of a connection to the heat pump convector (FWXV). ▪ 2 (H/C request): The connected external room thermostat sends a heating demand and is connected to the digital input (preserved for the main leaving water temperature zone) on the NHY2KOMB28+32AA gas boiler (X4/6). Select this value in case of connection with the wired (EKRTWA) or wireless (EKRTR1) room thermostat.
[A.2.2.B]	[C-08]	External sensor When an optional external ambient sensor is connected, the type of the sensor must be set. See "7 Application guidelines" on page 17. ▪ 0 (No): NOT installed. The thermistor in the user interface and in the heat pump module are used for measurement. ▪ 1 (Outdoor sensor): Installed. The outdoor sensor will be used to measure the outdoor ambient temperature. **Remark:** For some functionality, the temperature sensor in the outdoor unit is still used. ▪ 2 (Room sensor): NOT applicable.

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. ▪ 0 (Economical): reduction of energy costs ▪ 1 (Ecological): reduction of primary energy consumption, but not necessarily energy costs

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

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.

INFORMATION

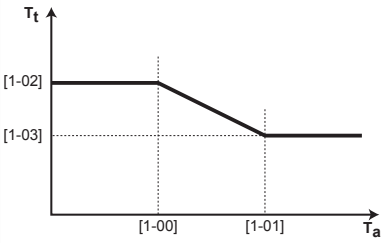
Solar panels. If solar panels are used, set the electricity price value very low to promote the use of the heat pump.

Space heating control

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

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

Leaving water temperature: Main zone

#	Code	Description
[A.3.1.1.1]	N/A	`LWT setpoint mode`: ▪ 0 `Fixed`: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ 1 `Weather dep.`: The desired leaving water temperature is: ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) continued >>
[A.3.1.1.1]	N/A	<< continuation ▪ 2 `Fixed/scheduled`: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e., does NOT depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired shift actions, either preset or custom. **Remark:** This value can only be set in leaving water temperature control. ▪ 3 `WD/scheduled`: The desired leaving water temperature is: ▪ weather-dependent (i.e., does depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired leaving water temperatures either preset or custom **Remark:** This value can only be set in leaving water temperature control.
[7.7.1.1]	[1-00] [1-01] [1-02] [1-03]	`Set weather-dependent heating`:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>
[7.7.1.1]	[1-00] [1-01] [1-02] [1-03]	<< continuation ▪ [1-00]: Low outdoor ambient temperature. –40°C~+5°C ▪ [1-01]: High outdoor ambient temperature. 10°C~25°C ▪ [1-02]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. [9-01]°C~[9-00]°C **Note:** This value should be higher than [1-03] as for low outdoor temperatures warmer water is required. ▪ [1-03]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. [9-01]°C~min(45, [9-00])°C **Note:** This value should be lower than [1-02] as for high outdoor temperatures less warm water is required.

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.

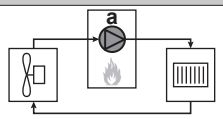
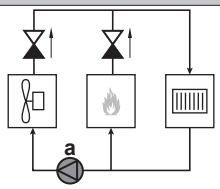
NOTICE

In case of third-party gas boiler:

If you use weather-dependent operation, make sure to set the values for the weather-dependent curves twice for correct operation:

- Once on the user interface of the outdoor unit
- Once on the third-party gas boiler

Pump control

NHY2KOMB28+32AA gas boiler	Third-party gas boiler
 **a** Main pump (= inside the gas boiler)	 **a** Main pump (= external pump)

If...		Then the main pump runs...
Space heating is done by...	**And...**	
Outdoor unit only	[C-0B]=1	According to ΔT control (see below).
	[C-0B]=0	At maximum pump speed.
Gas boiler only (only applicable in case of NHY2KOMB28+32AA gas boiler)		At maximum pump speed.
Combination of outdoor unit and gas boiler (only applicable in case of NHY2KOMB28+32AA gas boiler)		

Field setting [C-0B] defines whether ΔT control is enabled. The main pump will only run according to ΔT control if [C-0B] is set to 1 and space heating is done by the outdoor unit only. If the pump runs according to ΔT control:

If `Emitter type` [2-0C]=...	Then the target ΔT in heating is...
0: Underfloor heating	Variable according to [1-0B].
1: Fancoil unit	
2: Radiator	Fixed (10°C).

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:

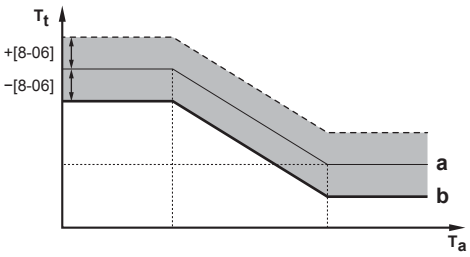
- stable room temperatures exactly matching the desired temperature (high comfort level),
- less On/OFF cycles (low noise level, high comfort and efficiency levels)
- as low as possible leaving water temperatures (high efficiency).

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]	`Modulated LWT`: ▪ `No`: disabled. **Note:** The desired leaving water temperature needs to be set on the user interface. ▪ `Yes`: enabled. **Note:** The desired leaving water temperature can only be read out on the user interface
N/A	[8-06]	Leaving water temperature maximum modulation: Range: 0°C~10°C Requires modulation to be enabled. This is the value by which the desired leaving water temperature is increased or lowered.

INFORMATION

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

Therefore it is important to set this correctly.

#	Code	Description
[A.3.1.1.7]	[9-0B]	`Emitter type`: Reaction time of the system: ▪ `Quick` **Example:** Small water volume, fan coils, or radiators. ▪ `Slow` **Example:** Large water volume, floor heating loops.

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 ▪ 0: OFF. ▪ 1: On.

Leaving water temperature: Delta T source

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

#	Code	Description
[A.3.1.3.1]	[1-0B]	Heating: required temperature difference between entering and leaving water. Range: 3°C~10°C

Domestic hot water control

Only applicable in case of NHY2KOMB28+32AA gas boiler, and 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]	Domestic hot water Type: ▪ 0 (Reheat only): Only reheat operation is allowed. ▪ 1 (Reheat + sched.): The domestic hot water tank is heated according to a schedule and between the scheduled heatup cycles, reheat operation is allowed. ▪ 2 (Scheduled only): The domestic hot water tank can ONLY be heated according to a schedule.

See "Domestic hot water control: advanced" on page 64 for more details.

INFORMATION

There is a risk of space heating capacity shortage/comfort problem (in case of frequent domestic hot water operation, frequent and long space heating interruption will happen) when selecting [6-0D]=0 ([A.4.1] Domestic hot water Type=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]	Maximum setpoint The maximum temperature that users can select for the domestic hot water. You can use this setting to limit the temperature at the hot water taps. The maximum temperature is NOT applicable during disinfection function. See disinfection function. In case of [E-06]=1 (tank installed): ▪ If [E-07]=0: 40°C~70°C ▪ If [E-07]=4: 40°C~75°C ▪ If [E-07]=6: 40°C~60°C In case of [E-06]=0 (no tank installed): ▪ 40°C~65°C

Contact/helpdesk number

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

10.1.3 Advanced configuration/optimization

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

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

#	Code	Description
Preset leaving water temperature for the main leaving water temperature zone in case of NOT weather dependent		
[7.4.2.1]	[8-09]	Comfort (heating) [9-01]°C~[9-00]°C
[7.4.2.2]	[8-0A]	Eco (heating) [9-01]°C~[9-00]°C
Preset leaving water temperature (shift value) for the main leaving water temperature zone in case of weather dependent		
[7.4.2.5]	N/A	Comfort (heating) –10°C~+10°C
[7.4.2.6]	N/A	Eco (heating) –10°C~+10°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.

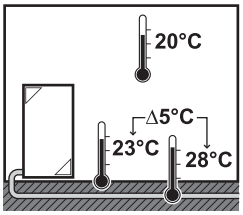
NOTICE

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
[A.3.1.1.2.2]	[9-00]	Maximum temp (heating) 37°C~80°C
[A.3.1.1.2.1]	[9-01]	Minimum temp (heating) 15°C~37°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.

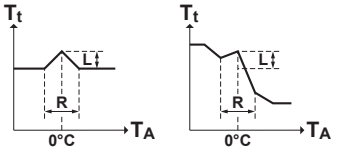
#	Code	Description
N/A	[9-04]	1°C~4°C

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]	▪ 0 (disabled) ▪ 1 (enabled) L=2°C, R=4°C (−2°C<T_A<2°C) ▪ 2 (enabled) L=4°C, R=4°C (−2°C<T_A<2°C) ▪ 3 (enabled) L=2°C, R=8°C (−4°C<T_A<4°C) ▪ 4 (enabled) L=4°C, R=8°C (−4°C<T_A<4°C)

Leaving water temperature maximum modulation

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

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
[A.3.2.1.1]	[3-07]	Minimum temp (heating) 12°C~18°C

Room temperature step

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

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

Room temperature offset

ONLY applicable in case of room thermostat control. You can calibrate the room temperature sensor. It is possible to give an offset to the room thermistor value measured by the user interface. The settings can be used to compensate for situations where the user interface cannot be installed on the ideal installation location.

#	Code	Description
`Room temp. offset`: Offset on the actual room temperature measured on the user interface sensor.		
[A.3.2.2]	[2-0A]	–5°C~5°C, step 0.5°C

Room frost protection

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

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

NOTICE

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

INFORMATION

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

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

[C-07]=2: room thermostat control

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

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

INFORMATION

If a U5 error occurs, 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:

- When the leaving water temperature home page is OFF and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered.
- When the leaving water temperature home page is ON, the external room thermostat is "Thermo OFF" and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again and the leaving water temperature setpoint will be lowered.
- When the leaving water temperature home page is ON and the external room thermostat is "Thermo ON", then room frost protection is guaranteed by the normal logic.

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

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

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

Operation range

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

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

#	Code	Description
[A.3.3.1]	[4-02]	14°C~35°C

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

`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

`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

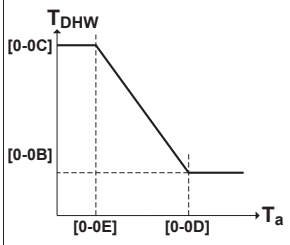
Reheat hysteresis

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

#	Code	Description
N/A	[6-08]	2°C~20°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	Desired temperature mode: ▪ `Fixed`: disabled. All desired tank temperature are NOT weather dependent. ▪ `Weather dep.`: enabled. In scheduled or scheduled+reheat mode, the storage comfort temperature is weather dependent. Storage economic and reheat temperatures are NOT weather dependent. In reheat mode, the desired tank temperature is weather dependent. **Note:** When the displayed tank temperature is weather dependent, it cannot be adjusted on the user interface.
[A.4.7]	[0-0E] [0-0D] [0-0C] [0-0B]	`Weather-dependent curve`  ▪ T_{DHW}: The desired tank temperature. ▪ T_a: The (averaged) outdoor ambient temperature ▪ [0-0E]: low outdoor ambient temperature: –40°C~5°C ▪ [0-0D]: high outdoor ambient temperature: 10°C~25°C ▪ [0-0C]: desired tank temperature when the outdoor temperature equals or drops below the low ambient temperature: 45°C~[6-0E]°C ▪ [0-0B]: desired tank temperature when the outdoor temperature equals or rises above the high ambient temperature: 35°C~[6-0E]°C

Timers for simultaneous request space and domestic hot water operation

When the unit starts heating the domestic hot water tank, it continuous 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

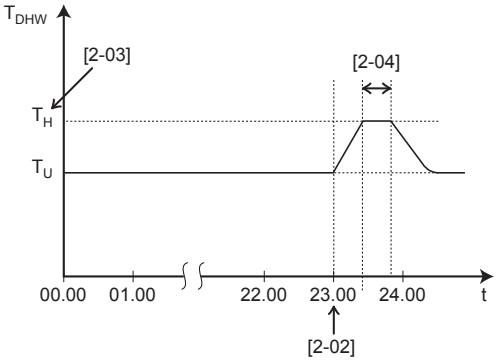
The disinfection function settings MUST be configured by the installer according to the applicable legislation.

CAUTION

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

#	Code	Description
[A.4.4.2]	[2-00]	`Operation day`: ▪ 0: `Each day` ▪ 1: `Monday` ▪ 2: `Tuesday` ▪ 3: `Wednesday` ▪ 4: `Thursday` ▪ 5: `Friday` ▪ 6: `Saturday` ▪ 7: `Sunday`
[A.4.4.1]	[2-01]	`Disinfection` ▪ 0: `No` ▪ 1: `Yes`
[A.4.4.3]	[2-02]	`Start time`: 00~23:00, step: 1:00.

#	Code	Description
[A.4.4.4]	[2-03]	`Temperature target`: fixed value
[A.4.4.5]	[2-04]	`Duration` Range: 40~60 minutes



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

WARNING

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

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

CAUTION

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

INFORMATION

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

INFORMATION

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

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

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

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

INFORMATION

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

INFORMATION

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

Bivalent

Only applicable in case of third-party gas boiler.

About bivalent

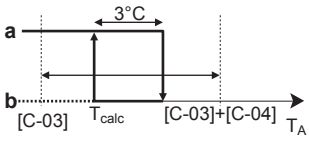
The purpose of this function is to determine which heating source can/will provide the space heating, either the outdoor unit or the third-party gas boiler.

The switch-over between the outdoor unit and the gas boiler is based on the following settings:

- [C-03] and [C-04]
- Electricity and gas prices ([7.4.5.1], [7.4.5.2], [7.4.5.3], and [7.4.6])

[C-03], [C-04], and T_{calc}

Based on the settings above, the outdoor unit calculates a value T_{calc}, which is variable between [C-03] and [C-03]+[C-04].



T_A Outdoor temperature
T_{calc} Bivalent ON temperature (variable). Below this temperature, the gas boiler will always be ON. T_{calc} can never go below [C-03] or above [C-03]+[C-04].
3°C Fixed hysteresis to prevent too much switching between outdoor unit and gas boiler
a Gas boiler active
b Gas boiler inactive

If the outdoor temperature…	Then…	
	Space heating by the outdoor unit…	Bivalent signal for the gas boiler is…
Drops below T_{calc}	Stops	Active
Rises above T_{calc}+3°C	Starts	Inactive

INFORMATION

The bivalent signal for the third-party gas boiler is located on X2M/7+8 of the outdoor unit. When it is activated, contact X2M/7+8 is closed. When it is deactivated, X2M/7+8 is open.

See also "To connect the bivalent signal for third-party gas boiler" on page 46.

#	Code	Description
N/A	[C-03]	Range: –25°C~25°C (step: 1°C)

#	Code	Description
N/A	[C-04]	Range: 2°C~10°C (step: 1°C) The higher the value of [C-04], the higher the accuracy of the switch-over between the outdoor unit and the gas boiler.

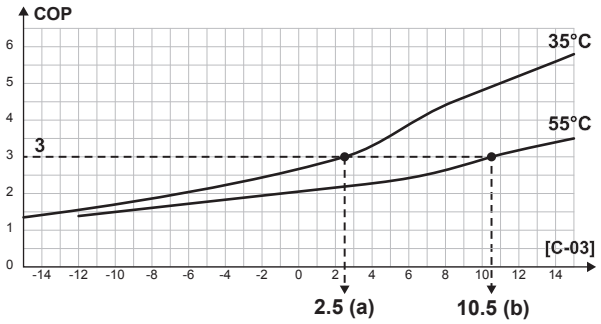
To determine the value of [C-03], proceed as follows:

1 Determine the COP (= coefficient of performance) using the formula:

Formula	Example
COP = (Electricity price / gas price)[(a)] × boiler efficiency	If: ▪ Electricity price: 20 c€/kWh ▪ Gas price: 6 c€/kWh ▪ Boiler efficiency: 0.9 Then: COP = (20/6)×0.9 = **3**

(a) Make sure to use the same units of measurement for the electricity price and gas price (example: both c€/kWh).

2 Determine the value of [C-03] using the graph:



Example:
a [C-03]=2.5 in case of COP=3 and LWT=35°C
b [C-03]=10.5 in case of COP=3 and LWT=55°C

NOTICE

Make sure to set the value of [5-01] at least 1°C higher than the value of [C-03].

Electricity and gas prices

INFORMATION

To set electricity and gas price values, do NOT use overview settings. Set them in the menu structure instead ([7.4.5.1], [7.4.5.2], [7.4.5.3], and [7.4.6]). For more information on how to set the energy prices, see the operation manual and the user reference guide.

INFORMATION

Solar panels. If solar panels are used, set the electricity price value very low to promote the use of the heat pump.

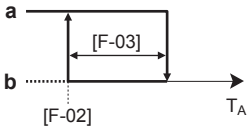
#	Code	Description
[7.4.5.1]	N/A	What is the high electricity price?
[7.4.5.2]	N/A	What is the medium electricity price?
[7.4.5.3]	N/A	What is the low electricity price?
[7.4.6]	N/A	What is the fuel price?

Bottom plate heater

Applies only when the option bottom plate heater kit is installed.

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

Bottom plate heater



T_A Outdoor temperature
a On
b OFF

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

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]	Defines if gas boiler operation is allowed when the ambient temperature exceeds the set equilibrium temperature during space heating operation. ▪ 0: allowed. ▪ 1: NOT allowed.
N/A	[5-01]	Equilibrium temp. 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: –14°C~35°C

NOTICE

In case of third-party gas boiler:

- To allow more heat pump operation, it is highly recommended NOT to change the default setting of [5-00], and keep the value at "1".
- If there is a capacity shortage, you can allow more gas boiler operation by increasing [5-01].
- Make sure to set the value of [5-01] at least 1°C higher than the value of [C-03].

Boiler only ambient temperature

#	Code	Description
[A.5.2.3]	[8-0E]	Boiler only ambient temp When the ambient temperature is lower than this temperature, the heat pump is NOT allowed to work. Range: –14°C~25°C

NOTICE

- If you install the bottom plate heater, you may lower the operation range of the heat pump to Ta≥–14°C using field setting [8-0E]=–14°C.
- If you do not install the bottom plate heater, keep [8-0E]=–5°C.

For more information about the bottom plate heater, see "5.2.2 Bottom plate heater" on page 12.

System settings

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]	Is the auto restart function of the unit allowed? ▪ 0: No ▪ 1: Yes

Power consumption control

Pwr consumpt. control

#	Code	Description
[A.6.3.1]	[4-08]	Mode: ▪ 0 (No limitation): Disabled. ▪ 1 (Continuous): Enabled: You can set one power limitation value (in A or kW) to which the system power consumption will be limited for all the time.
[A.6.3.2]	[4-09]	Type: ▪ 0 (Current): The limitation values are set in A. ▪ 1 (Power): The limitation values are set in kW.
[A.6.3.3]	[5-05]	Value: Only applicable in case of full time power limitation mode. 0 A~50 A, step: 1 A
[A.6.3.4]	[5-09]	Value: Only applicable in case of full time power limitation mode. 0 kW~20 kW, step: 0.5 kW

Average timer

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

The outdoor temperature is averaged over the selected time period.

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

Offset temperature external outdoor ambient sensor

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

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

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

Forced defrost

You can manually start a defrost operation.

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

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

Disable protections

The software is equipped with an "installer-on-site" mode ([A.6.D]: Disable protections) that disables automatic operation by the unit.

#	Code	Description
[A.6.D]	N/A	▪ ON: Automatic operation is disabled. All protective functions are disabled. If the user interface home pages are off, the unit will NOT operate automatically. To enable automatic operation and the protective functions, set Disable protections=OFF. ▪ OFF: 12 hours after the first power-on, the unit will automatically set Disable protections=OFF, ending "installer-on-site" mode and enabling the protective functions. If the installer returns to the site, the installer has to set Disable protections=ON manually.

Pump operation

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

#	Code	Description
N/A	[F-00]	Pump operation: ▪ 0: Disabled if outdoor temperature is higher than [4-02] or lower than [F-01] depending on heating operation mode. ▪ 1: Possible at all outdoor temperatures.

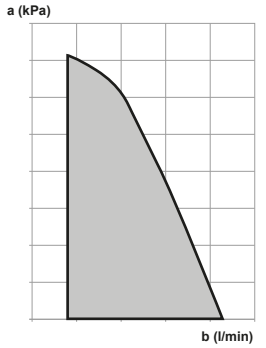
Pump speed limitation

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 also be overruled when delta T is abnormal.

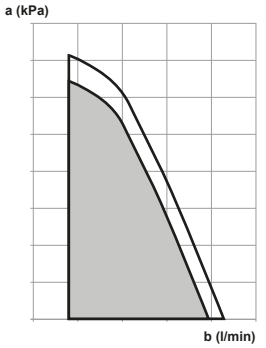
#	Code	Description
N/A	[9-0D]	Pump speed limitation ▪ 0: No limitation. ▪ 1~4: General limitation. There is limitation in all conditions. The required delta T control and comfort are **NOT** guaranteed. ▪ 5~8: Limitation when no actuators. When there is no heating output, the pump speed limitation is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

The maximum values depend on the unit type:

[9-0D]=0

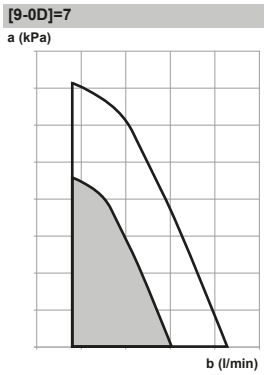


[9-0D]=5

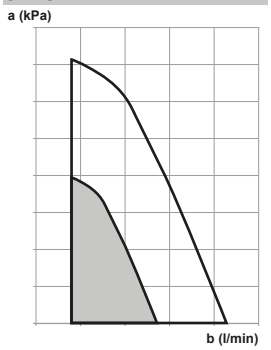


[9-0D]=6

[9-0D]=7

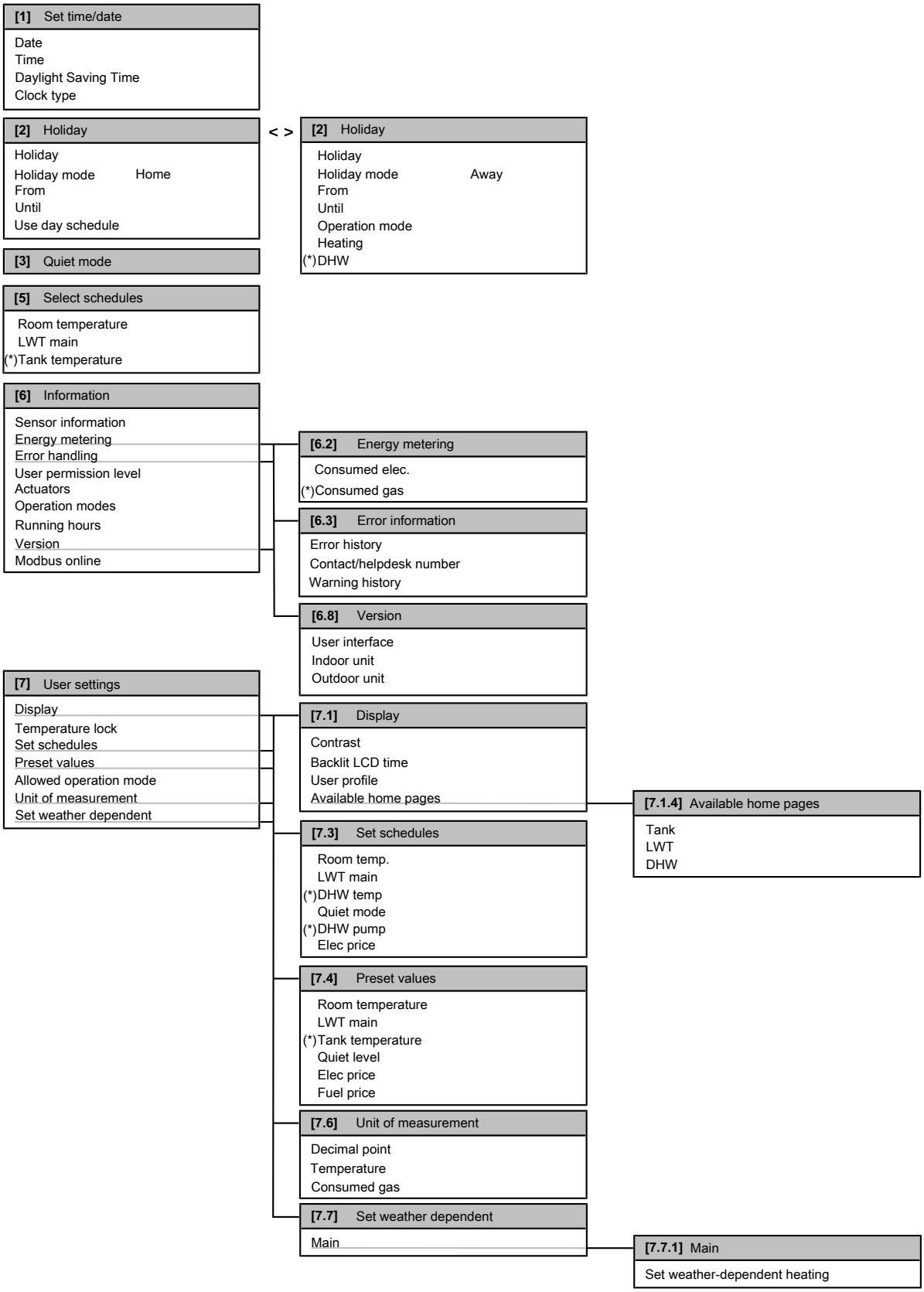


[9-0D]=8



a External static pressure
b Water flow rate

10.1.4 Menu structure: Overview user settings

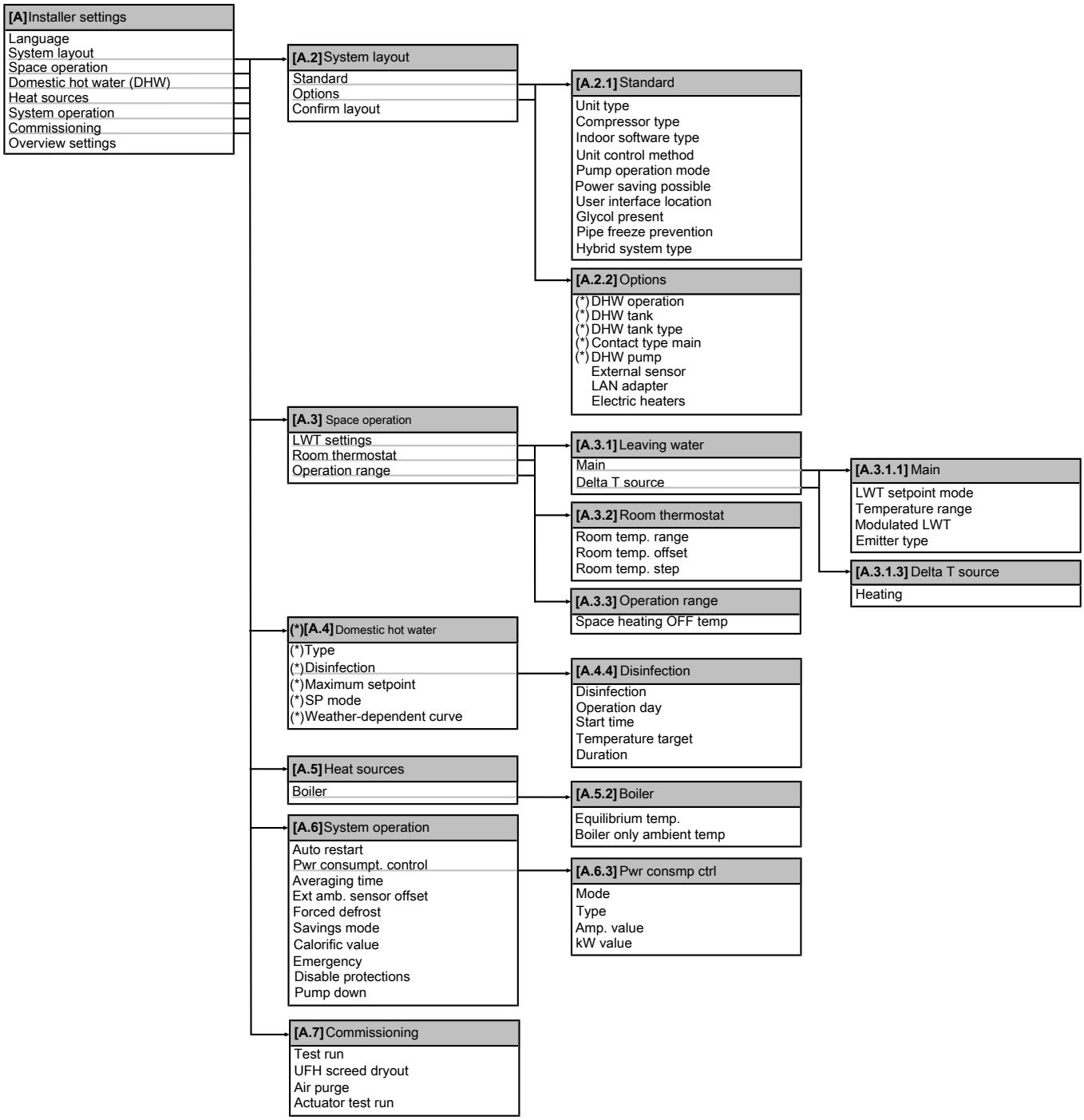


(*) Only applicable in case of NHY2KOMB28+32AA gas boiler

INFORMATION

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

10.1.5 Menu structure: Overview installer settings



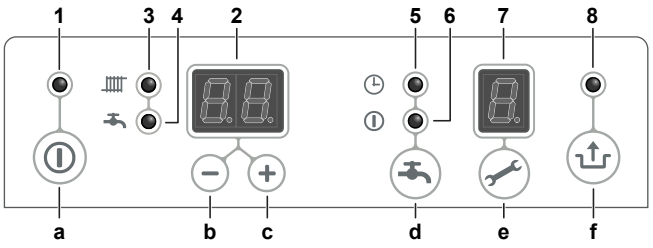
(*) Only applicable in case of NHY2KOMB28+32AA gas boiler

INFORMATION

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

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	− button
c	+ button
d	Domestic hot water function off/eco/on
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" on page 92) and resolve the cause.

1 Press ↑ to restart the gas boiler.

Maximum space heating supply temperature

See the user reference guide for more details.

Domestic hot water temperature

See the user reference guide for more details.

Keep hot function

The reversible heat pump features a keep hot function that keeps the heat exchanger hot continuously to prevent sweat from occurring in the gas boiler switch box.

In case of heating only models, this function can be deactivated through the parameter settings of the gas boiler.

INFORMATION

Do NOT deactivate the keep hot function if the gas boiler is connected to a reversible indoor unit. It is recommended to always deactivate the keep hot function if the gas boiler is connected to a heating only indoor unit.

It is recommended to always deactivate the keep hot function.

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, 7 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 0 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 P 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
0	Service code	—	—	To access the installer settings, enter the service code (=15)

Parameter	Setting	Range	Default settings	Description
1	Installation type	0~3	0	▪ 0=Combi ▪ 1=Heating only + external domestic hot water tank ▪ 2=Domestic hot water only (no heating system required) ▪ 3=Heating only It is recommended not to modify this setting.
2	Space heating pump continuous	0~3	0	▪ 0=Post purge period only ▪ 1=Pump continuously active ▪ 2=Pump continuously active with MIT switch ▪ 3=Pump on with external switch This setting has no effect.
3	Maximum space heating power set	c~85%	60%	Maximum power in heating. This is a percentage of the maximum set in parameter h. We strongly recommend not modifying this setting.
3.	Maximum capacity space heating pump	—	80	The setting is controlled by the heat pump.
4	Maximum domestic hot water power set (not applicable for Switzerland)	d~100%	100%	Maximum power in instant domestic hot water. This is a percentage of the maximum set in parameter h. 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.
5	Minimum supply temperature of the heat curve	10°C~25°C	25°C	Do NOT modify this setting on the boiler. Use the user interface instead.
5.	Maximum supply temperature of the heat curve	30°C~90°C	90°C	Do NOT modify this setting on the boiler. Use the user interface instead.
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	0 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	0 min	Changing this setting has no effect on the operation of the unit.
A	Position 3-way valve or electric valve	0~3	0	▪ 0=Not inverted ▪ 1=Inverted ▪ 2 and higher=Not applicable
b	Booster	0~1	0	Changing this setting has no effect on the operation of the unit.
C	Step modulation	0~1	1	▪ 0=OFF during space heating operation ▪ 1=ON during space heating operation It is recommended not to modify this setting.
c	Minimal space heating rpm	23%~50%	30%	Adjustment range 23~50%. It is recommended not to modify this setting in case of natural gas.
c.	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%	25%	Adjustment range 23~50% (40=propane). It is recommended not to modify this setting in case of natural gas.
E.	Reversible setting	0~1	0	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). ▪ 0=disabled ▪ 1=enabled
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%	Do not modify this setting.
h	Maximum fan rpm	45~50	NHY2KOMB28 AA: 48 NHY2KOMB32 AA: 50	Use this parameter to set the maximum fan rpm. It is recommended not to modify this setting.
L	Legionella protection (only when external hot water tank is connected)	0~2	0	▪ 0=Not active ▪ 1=Active 1 time per week ▪ 2=Active 1 time per day
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.
0.	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.
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	▪ 24: Not applicable. ▪ 30: Only for NHY2KOMB28AA ▪ 36: Only for NHY2KOMB32AA
q	Summer mode	1~3	0	▪ 0=Summer mode deactivated ▪ 1=Summer mode to be activated with ⏻ button (code on display=Su) ▪ 2=Summer mode to be activated with ⏻ button (code on display=So) ▪ 3=Summer mode to be activated with ⏻ button (code on display=Et)
r	Heating curve coefficient	0	0	Not applicable

Maximum space heating power setting

The maximum space heating power setting (Ǝ) 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)
NHY2KOMB28AA	NHY2KOMB32AA	
23.1	26.6	85
20.1	22.4	70
17.4	19.2	60
14.6	16.0	50
11.8	12.8	40
7.7	8.0	25

A minimum flow rate must be guaranteed so that the boiler does not go in high temperature error. This can be maintained by opening the radiator valves if there are any closed, or adding an appropriate by-pass way in between space heating outlet and space heating inlet of the boiler if thermostatic valves are fitted to all radiators.

Minimum required flow rate values for corresponding set powers are given in the table below.

Minimum flow rate (l/min)	Set power (kW)
2.6	5.4 kW
4.0	8.5 kW
8.5	17.8 kW
12.5	26.2 kW

Note that for the gas boiler the power during burning is increased slowly and is reduced as soon as the supply temperature is reached.

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 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 "6.3.3 Possible options for the gas boiler" on page 14.

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.

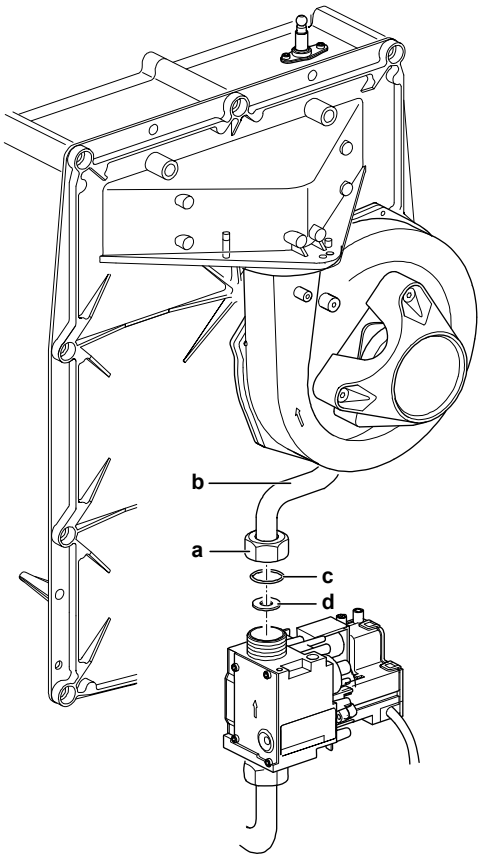
10 Check the gas connections after the gas valve for gastightness (during operation).

11 Now check the setting of the CO_2 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 carbon dioxide setting

The CO_2 setting has been set in the factory and in principle requires no adjustments. The setting can be checked by measuring the CO_2 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_2 percentage when the cover is open.

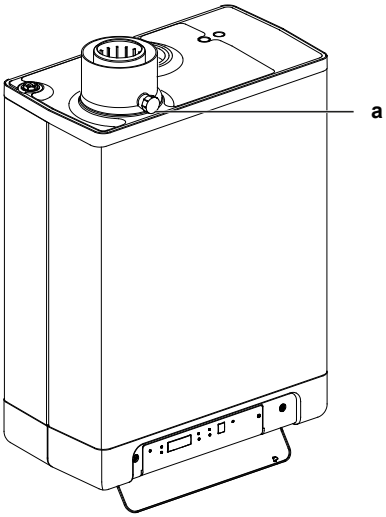
To check the carbon dioxide setting

1 Switch off the heat pump module with the user interface.

2 Switch off the gas boiler with the ⏻ 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 ⏻ button and create a space heating demand.

6 Select High setting by simultaneously pressing 🔧 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 🔧 and + again.

7 Allow readings to stabilise. Wait for at least 3 minutes and compare the CO_2 percentage with the values in the table below.

CO_2 value at maximum power	Natural gas G20	Natural gas G25 (in Belgium)	Propane P G31 (30/50 mb ar)	Propane P G31 (37 mbar)
Maximum value	9.6	8.3	10.8	
Minimum value	8.6	7.3	9.8	

8 Note down the CO_2 percentage at maximum power. This is important with regard to the next steps.

CAUTION

It is NOT possible to adjust the CO_2 percentage when test program H is running. When the CO_2 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. L 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_2 percentage with the values in the table below.

CO_2 value at minimum power	Natural gas G20	Natural gas G25 (in Belgium)	Propane P G31 (30/50 mb ar)	Propane P G31 (37 mbar)
Maximum value	(a)			
Minimum value	8.4	7.4	9.4	9.4

(a) CO_2 value at maximum power recorded at High setting.

11 If the CO_2 percentage at maximum and minimum power is within the range expressed in the tables above, the CO_2 setting of the boiler is correct. If NOT, adjust the CO_2 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.

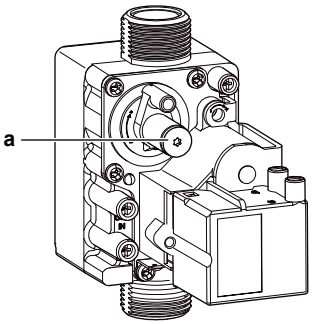
To adjust the carbon dioxide setting

INFORMATION

Only adjust the CO_2 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_2 percentage. See the table below for the desired value.



a Adjusting screw with cover

Measured value at maximum power	Adjustment values CO_2 (%) at minimum power (front cover opened)	
	Natural gas 2H (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_2 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_2 percentage. If the CO_2 percentage still deviates from the values in the table indicating the CO_2 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

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 outdoor unit. The boiler will start-up the heating process when there is a request from the outdoor 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. When a simultaneous demand of space heating and domestic hot water occurs, domestic hot water has priority over space heating.

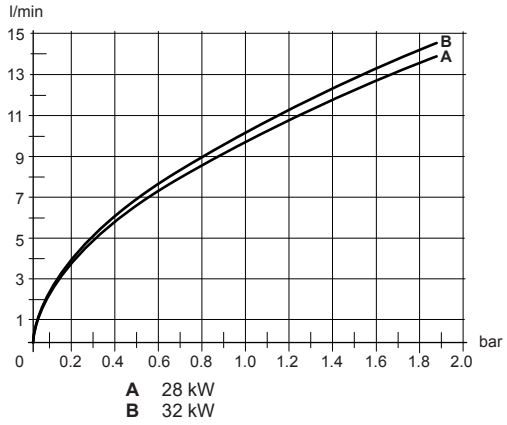
This manual only explains the domestic hot water making without having a domestic hot water tank combined with the system. For the operation and needed settings of domestic hot water in combination with a domestic hot water tank needed for Switzerland, please see the manual of the heat pump module.

INFORMATION

For NHY2KOMB28+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



A 28 kW
B 32 kW

The minimum flow for domestic hot water operation is 2 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 ⏻ 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.

0 Pump overrun of space heating

After each space heating operation, the pump continues to run. This function is controlled by the outdoor 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.

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.

Domestic hot water comfort function/Frost protection/Keep hot function

Not applicable for Switzerland

appears on the display when either the domestic hot water comfort function, the frost protection function or the keep hot function is active.

space heating operation

When a space heating request is received from the outdoor unit, 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

INFORMATION

The software is equipped with an "installer-on-site" mode ([A.6.D]: `Disable protections`) that disables automatic operation by the unit. At first installation, the default setting is `Disable protections=On`, meaning automatic operation is disabled. All protective functions are then disabled. If the user interface home pages are off, the unit will NOT operate automatically. To enable automatic operation and the protective functions, set `Disable protections=OFF`.

12 hours after the first power-on, the unit will automatically set `Disable protections=OFF`, ending "installer-on-site" mode and enabling the protective functions. If – after first installation – the installer returns to the site, the installer has to set `Disable protections=On` manually.

Especially for UK:

At the time of commissioning, complete all relevant sections of the Benchmark Checklist on the backpages of this document.

12.1 Overview: Commissioning

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

Typical workflow

Commissioning typically consists of the following stages:

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

12.2 Precautions when commissioning

INFORMATION

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

NOTICE

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

12.3 Checklist before commissioning

After the installation of the unit, first check the following items. Once all below checks are fulfilled, the unit MUST be closed, ONLY then can the unit be powered up.

Depending on the system layout, not all components may be available.

☐	You read the complete installation instructions, as described in the **installer reference guide**.
☐	The **outdoor unit** is properly mounted.
☐	The **gas boiler** is properly mounted.
☐	In case of NHY2KOMB28+32AA gas boiler: The following **field wiring** has been carried out according to the available documentation and the applicable legislation: ▪ Between the outdoor unit and the local supply panel ▪ Between the gas boiler and the local supply panel ▪ Between the outdoor unit and the gas boiler (communication) ▪ Between the gas boiler and the room thermostat (if applicable) ▪ Between the gas boiler and the domestic hot water tank (if applicable)
☐	In case of third-party gas boiler: The following **field wiring** has been carried out according to the available documentation and the applicable legislation: ▪ Between the outdoor unit and the local supply panel ▪ Between the gas boiler and the local supply panel ▪ Between the outdoor unit and the gas boiler (bivalent signal) ▪ Between the outdoor unit and the external pump
☐	The system is properly **earthed** and the earth terminals are tightened.

☐	The **fuses** or locally installed protection devices are installed according to this document, and have NOT been bypassed.
☐	The **power supply voltage** matches the voltage on the identification label of the unit.
☐	There are NO **loose connections** or damaged electrical components in the switch box.
☐	There are NO **damaged components** or **squeezed pipes** on the inside of the outdoor unit.
☐	The correct pipe size is installed and the **pipes** are properly insulated.
☐	There are no **water leaks** inside the outdoor unit.
☐	There is NO **water leak** inside the gas boiler.
☐	There is NO **water leak** in the connection between the gas boiler and the outdoor unit.
☐	The **shut-off valves** are properly installed and fully open.
☐	The **manual air purge valves** are closed, and the **automatic air purge valves** (if applicable) are open.
☐	The **pressure relief valve** purges water when opened.
☐	The **gas boiler** is switched ON.
☐	Setting E. is correctly set on the gas boiler. The setting must be 0.
☐	The **minimum water volume** is guaranteed in all conditions. See "To check the water volume" in "8.3 Preparing water piping" on page 26.
☐	If **glycol** was added to the system, confirm the correct glycol concentration, and check if glycol setting [E-0D]=1.

NOTICE

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

12.4 Checklist during commissioning

☐	The **minimum flow rate** is guaranteed in all conditions. See "To check the water volume and flow rate" in "8.3 Preparing water piping" on page 26.
☐	To perform an **air purge**.
☐	To perform a **test run**.
☐	To perform an **actuator test run**.
☐	**Underfloor screed dryout function** The underfloor screed dryout function is started (if necessary).
☐	To perform a gas pressure test.
☐	To perform a test run on the **gas boiler**.

12.4.1 Air purge function

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

NOTICE

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

There are 2 modes for purging air:

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

Typical workflow

The air purge procedure requires manual action. For a typical workflow, see "9.6.6 To fill the space heating circuit" on page 39.

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

The air purge function automatically stops after 42 minutes.

To perform a manual air purge

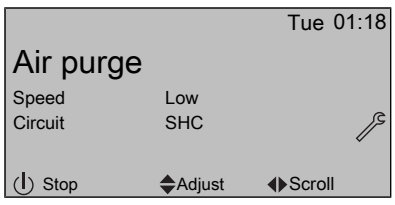
INFORMATION

Frost protection functions. After first power-on, the unit runs in "installer-on-site" mode (see "12.3 Checklist before commissioning" on page 78). When "installer-on-site" mode ends, the unit's frost protection functions are enabled, and you cannot start the air purge function if Ta<4°C.

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

1. Set the user permission level to Installer. See "To set the user permission level to Installer" on page 56.
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 set the desired pump speed.

   Result: `Low`

   Result: `High`

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

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

Result: `SHC` or `Tank`

To perform an automatic air purge

INFORMATION

Frost protection functions. After first power-on, the unit runs in "installer-on-site" mode (see "12.3 Checklist before commissioning" on page 78). When "installer-on-site" mode ends, the unit's frost protection functions are enabled, and you cannot start the air purge function if Ta<4°C.

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

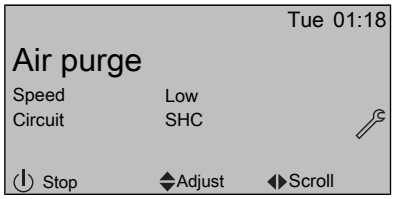
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 56.

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.

12.4.2 To perform a test run

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

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 56.

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

3 Select a test and press OK. **Example:** `Heating`.

4 Select `OK` and press OK.

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

INFORMATION

In case of third-party gas boiler:

When starting up the system in a cold climate, it may be required to start up with a small water volume. To do this, gradually open the heat emitters. As a result, the water temperature will gradually rise. Monitor the inlet water temperature ([6.1.6] in the menu structure) and make sure it does NOT drop below 15°C.

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.

12.4.3 To perform an actuator test run

Purpose of the actuator test run is to confirm the operation of the different actuators (e.g., when you select pump operation, a test run of the pump will start).

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

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 56.

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

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

4 Select `OK` and press OK.

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

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.

- 3-way valve test
- Bottom plate heater test
- Bivalent signal test (in case of third-party gas boiler)
- Circulation pump test
- Gas boiler test (in case of NHY2KOMB28+32AA gas boiler)

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.

12.4.4 Underfloor heating screed dryout

This function is used for drying out the screed of an underfloor heating system very slowly during the construction of a house. It allows the installer to program and execute this program.

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

INFORMATION

- If `Emergency` is set to `Manual` ([A.6.C]=0), and the unit is triggered to start emergency operation, the user interface will ask confirmation before starting. The underfloor heating screed dryout function is active even if the user does NOT confirm emergency operation.
- During underfloor heating screed dryout, pump speed limitation [9-0D] is NOT applicable.

NOTICE

The installer is responsible for:

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

NOTICE

To perform an underfloor heating screed dryout, room frost protection needs to be disabled ([2-06]=0). By default, it is enabled ([2-06]=1). However, due to the "installer-on-site" mode (see "Commissioning"), room frost protection will be automatically disabled for 12 hours after the first power-on.

If the screed dryout still needs to be performed after the first 12 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:

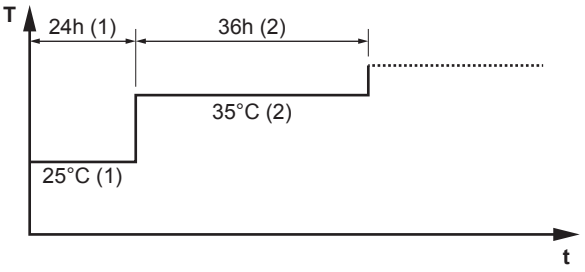
- [4-00]=1
- [D-01]=0
- [4-08]=0
- [4-01]≠1

The installer can program up to 20 steps. For each step he needs to enter:

1 the duration in hours, up to 72 hours,

2 the desired leaving water temperature.

Example:



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

To program an underfloor heating screed dryout schedule

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 56.

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

3 Use the ◀, ▶, ▲, and ▼ to program the schedule.
- Use ◀ and ▶ to scroll through the schedule.
- Use ▲ and ▼ to adjust the selection.
  If a time is selected, you can set the duration between 1 and 72 hours.
  If a temperature is selected, you can set the desired leaving water temperature between 15°C and 55°C.

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

5 To delete a step, set the duration to "–" by pressing ▲▼.

6 Press OK to save the schedule.

It is important that there is no empty step in the program. The schedule will stop when a blank step is programmed OR when 20 consecutive steps have been executed.

To perform an underfloor heating screed dryout

INFORMATION

In case of third-party gas boiler. Only the heat pump is used during the underfloor heating screed dryout. **Possible consequence:** Underfloor heating screed dryout is not possible at low outdoor temperatures.

Prerequisite: Make sure there is ONLY 1 user interface connected to your system to perform an underfloor heating screed dryout.

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

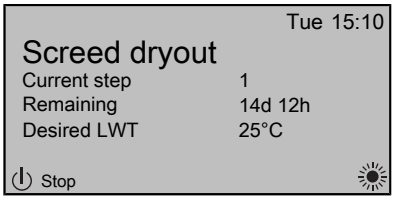
1 Go to [A.7.2]: ☰ > `Installer settings` > `Commissioning` > `UFH screed dryout`.

2 Set a dryout program.

3 Select `Start dryout` and press OK.

4 Select `OK` and press OK.

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



To readout the status of an underfloor heating screed dryout

1 Press ⌂.

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

INFORMATION

There is limited access to the menu structure. Only the following menus can be accessed:

- `Information`.
- `Installer settings > Commissioning > UFH screed dryout`.

To interrupt an underfloor heating screed dryout

When the program is stopped by an error, an operation switch off, or a power failure, the U3 error will be displayed on the user interface. To resolve the error codes, see "15.6 Solving problems based on error codes" on page 90. To reset the U3 error, your `User permission level` needs to be `Installer`.

1 Go to the underfloor heating screed dryout screen.

2 Press ⌂.

3 Press ⏻ to interrupt the program.

4 Select OK and press OK.

Result: The underfloor heating screed dryout program is stopped.

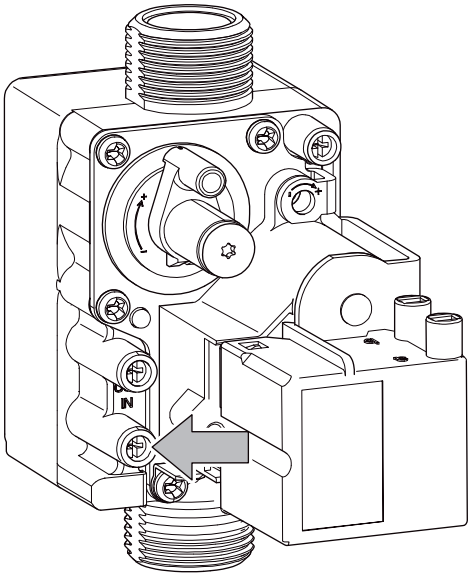
When the program is stopped due to an error, an operation switch-off, or a power failure, you can read out the underfloor heating screed dryout status.

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

6 Modify and restart the execution of the program.

12.4.5 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 "12.4.6 To perform a test run on the gas boiler" on page 82. 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.

12.4.6 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 gas boiler (pump starts and fan starts with a fixed 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.

13 Hand-over to the user

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

- Fill in the installer setting table (in the operation manual) with the actual settings.
- Make sure that the user has the printed documentation and ask him/her to keep it for future reference. Inform the user that he can find the complete documentation at the URL mentioned earlier in this manual.
- Explain the user how to properly operate the system and what to do in case of problems.
- Show the user what to do for the maintenance of the unit.
- Explain the user about energy saving tips as described in the operation manual.

14 Maintenance and service

Especially for UK:

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located on the backpages of this document.

NOTICE

Maintenance MUST be done by an authorized installer or service agent.

We recommend performing maintenance at least once a year. However, applicable legislation might require shorter maintenance intervals.

14.1 Overview: Maintenance and service

This chapter contains information about:

- The yearly maintenance of the outdoor unit
- Cleaning the gas boiler

14.2 Maintenance safety precautions

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING

NOTICE: Risk of electrostatic discharge

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

14.3 Outdoor unit

14.3.1 Opening the outdoor unit

See "9.2.2 To open the outdoor unit" on page 30.

14.3.2 Checklist for yearly maintenance of the outdoor unit

Check the following at least once a year:

- Heat exchanger
- Water pressure
- Water filter
- Water pressure relief valve
- Pressure relief valve of the domestic hot water tank
- Switch box
- Freeze protection valves
- Vacuum breaker

Heat exchanger

The heat exchanger of the outdoor unit can get blocked up due to dust, dirt, leaves, etc. It is recommended to clean the heat exchanger yearly. A blocked heat exchanger can lead to too low pressure or too high pressure leading to worse performance.

Water pressure

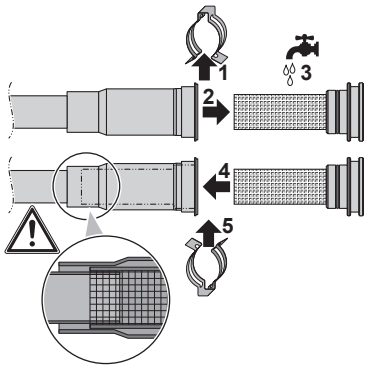
Keep water pressure above 1 bar. If it is lower, add water.

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).

It is recommended to do this maintenance more frequently.

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.

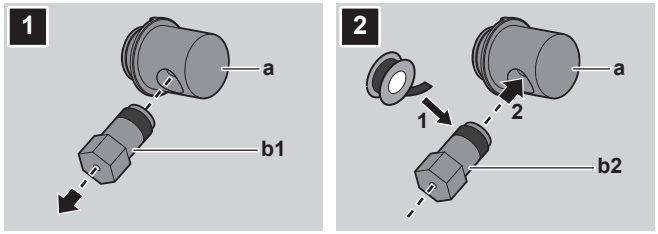
WARNING

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

Freeze protection valves

- Replace the freeze protection valves every 3~7 years (depending on the water quality).
- Replace the freeze protection valves if they do not close properly anymore. **Example:** When they opened and dirt got stuck inside the valves.

Example: Replace the freeze protection valve inside the outdoor unit as follows:



a Connection piece for freeze protection valve
b1 Old freeze protection valve
b2 New freeze protection valve

Vacuum breaker

Dismantle the vacuum breaker and clean it's cartridge with water.

In case of malfunction: replace the vacuum breaker.

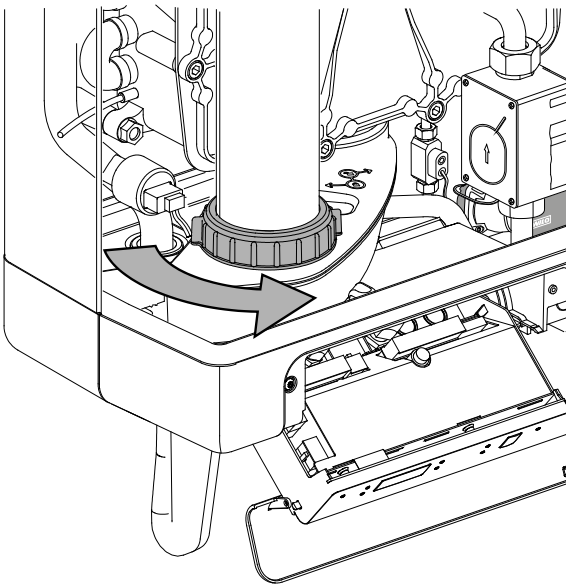
14.4 Gas boiler

14.4.1 Opening the gas boiler

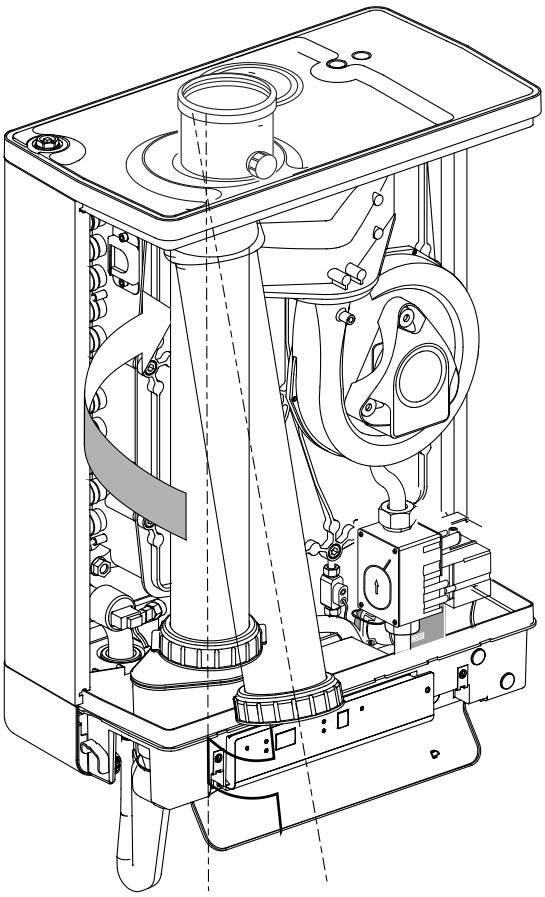
See "9.2.3 To open the gas boiler" on page 31.

14.4.2 To disassemble the gas boiler

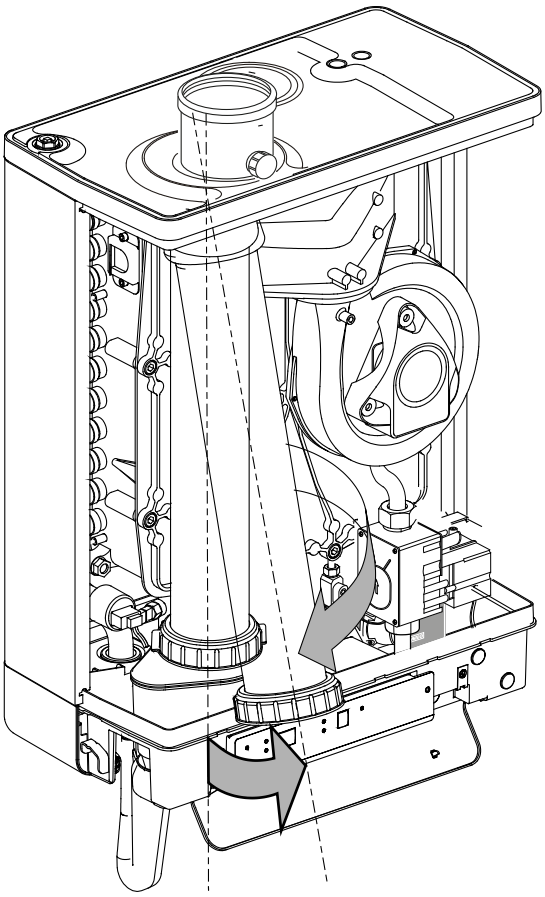
1 Turn off the appliance.
2 Turn off the main power supply of the appliance.
3 Close the gas tap.
4 Remove the front panel.
5 Wait until the appliance has cooled down.
6 Unscrew the coupling nut at the base of the flue pipe by turning counterclockwise.



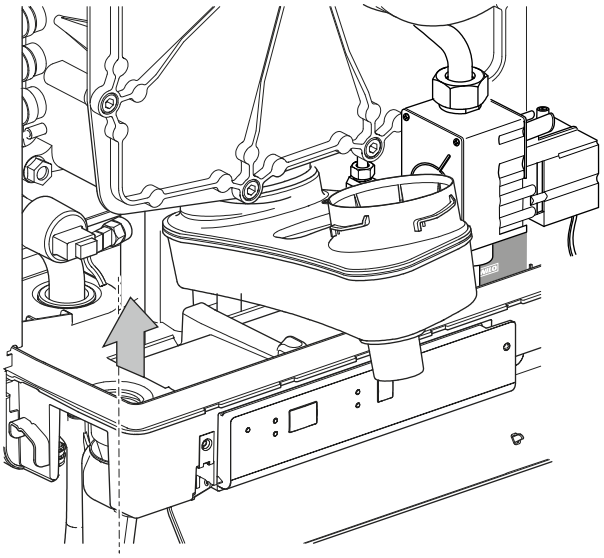
7 Slide the flue pipe upwards by turning it clockwise until the bottom of the pipe is above the condensate drain pan connection.



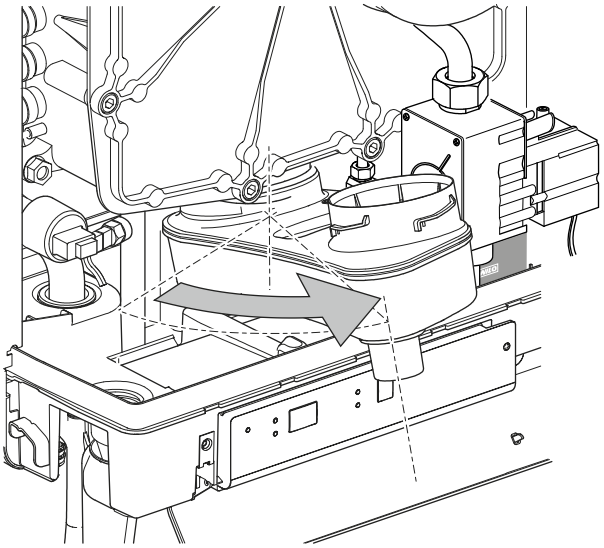
8 Pull the bottom of the pipe forwards and remove the pipe downwards by turning the pipe alternately clockwise and counterclockwise.



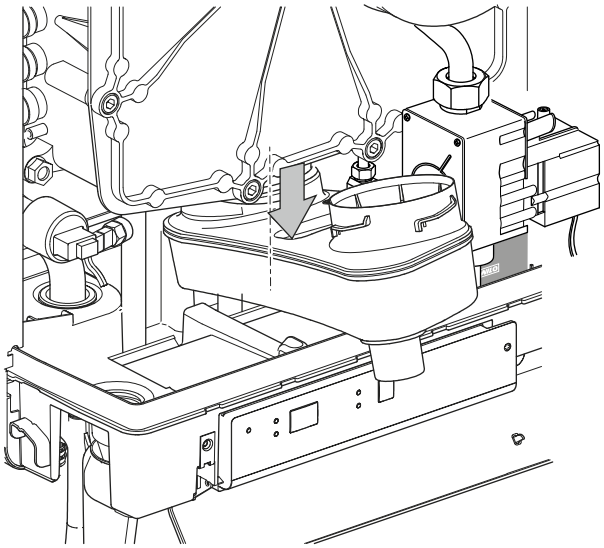
9 Lift the condensate drain pan on the left-hand side from the connection to the condensate trap.



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.

14.4.3 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.

14.4.4 To assemble the gas boiler

CAUTION

- When fitting the various seals, check them for damage, hardening, tears or hairline tears, and/or discolouration. Replace them when necessary.
- Check the position of the seals.
- Not fitting the sensors S1 and/or S2 or fitting them incorrectly can result in serious damage.
- Warranty will be void by NOT correctly replacing the removed parts.

1 Check the correct position of the seal around the front cover.

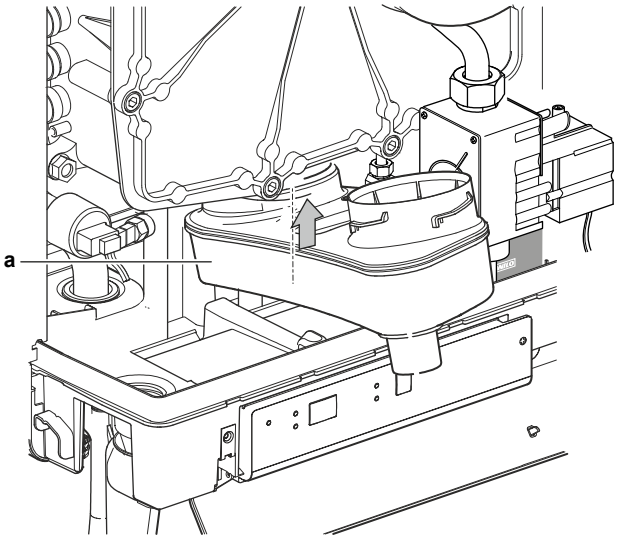
2 Place the front cover on the heat exchanger and secure by using the socket head screws plus serrated lock washers.

3 Tighten the socket head screws equally hand-tight by turning the hex key clockwise.

4 Fit the gas connection below the gas valve.

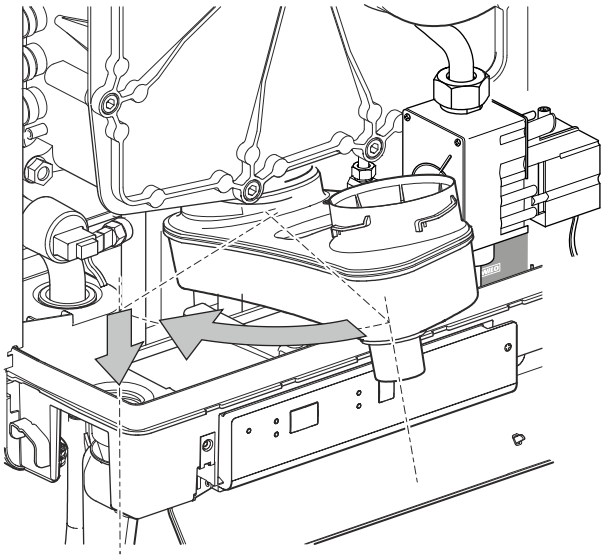
5 Fit the connector to the fan and the ignition unit to the gas valve.

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

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

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.

DANGER: RISK OF ELECTROCUTION

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.

DANGER: RISK OF BURNING

15.3 General guidelines

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

15.4 Solving problems based on symptoms

15.4.1 Symptom: The unit is NOT heating as expected

Possible causes	Corrective action
The temperature setting is NOT correct	Check the temperature setting on the remote controller. See the operation manual.

Possible causes	Corrective action
The water flow is too low	Check and make sure that: ▪ All shut-off valves of the water circuit are completely open. ▪ The water filter is clean. Clean if necessary. ▪ There is no air in the system. Purge air if necessary. You can purge air manually (see "To perform a manual air purge" on page 79) or use the automatic air purge function (see "To perform an automatic air purge" on page 80). ▪ The water pressure is >1 bar. ▪ The expansion vessel is NOT broken. ▪ The resistance in the water circuit is NOT too high for the pump (see the ESP curve in the "Technical data" chapter). If the problem persists after you have conducted all of the above checks, contact your dealer. In some cases, it is normal that the unit decides to use a low water flow.
The water volume in the installation is too low	Make sure that the water volume in the installation is above the minimum required value (see "8.3.4 To check the water volume and flow rate" on page 28).

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

Possible causes	Corrective action
The unit must start up out of its operation range (the water temperature is too low)	If the water temperature is too low, the unit uses the gas boiler to reach the minimum water temperature first (15°C). Check and make sure that: ▪ The power supply to the gas boiler is correctly wired. ▪ The interconnection cable between the gas boiler and the outdoor unit is properly connected. If the problem persists after you have conducted all of the above checks, contact your dealer.

15.4.3 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see "To perform a manual air purge" on page 79) or use the automatic air purge function (see "To perform an automatic air purge" on page 80).
The water pressure at the pump inlet is too low	Check and make sure that: ▪ The water pressure is >1 bar. ▪ The pressure sensor of the gas boiler is not broken. ▪ The expansion vessel is NOT broken. ▪ The pre-pressure setting of the expansion vessel is correct (see the manual of the expansion vessel).

15.4.4 Symptom: The pressure relief valve opens

Possible causes	Corrective action
The expansion vessel is broken	Replace the expansion vessel.
The water volume in the installation is too high	Make sure that the water volume in the installation is below the maximum allowed value (see "8.3.4 To check the water volume and flow rate" on page 28 and "8.3.5 Changing the pre-pressure of the expansion vessel" on page 29).
The water circuit head is too high	The water circuit head is the difference in height between the outdoor unit and the highest point of the water circuit. If the outdoor unit is located at the highest point of the installation, the installation height is considered 0 m. The maximum water circuit head is defined by the expansion vessel (see the option on boiler or third-party expansion vessel). Check the installation requirements.

15.4.5 Symptom: The water pressure relief valve leaks

Possible causes	Corrective action
Dirt is blocking the water pressure relief valve outlet	Check whether the pressure relief valve works correctly by turning the red knob on the valve counterclockwise: ▪ If you do NOT hear a clacking sound, contact your dealer. ▪ If the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your dealer.

15.4.6 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: ▪ The gas boiler is switched On and is NOT in standby mode. ▪ The communication cable between the gas boiler and the outdoor unit is properly mounted. ▪ There is no error code on the gas boiler display.
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: ▪ [A.5.2.2] > `Installer settings` > `Heat sources` > `Boiler` > `Equilibrium temp.` OR ▪ [A.8] > `Installer settings` > `Overview settings` [5-01]
There is air in the system.	Purge air manually or automatically. See the air purge function in the "Commissioning" chapter.

15.4.7 Symptom: The pressure at the tapping point is temporarily unusually high

Possible causes	Corrective action
Failing or blocked pressure relief valve.	▪ Flush and clean the complete tank including the piping between pressure relief valve and the cold water inlet. ▪ Replace the pressure relief valve.

15.4.8 Symptom: Tank disinfection function is NOT completed correctly (AH-error)

Possible causes	Corrective action
The disinfection function was interrupted by domestic hot water tapping	Program the start-up of the disinfection function when the coming 4 hours NO domestic hot water tapping is expected.
Large domestic hot water tapping happened recently before the programmed start-up of the disinfection function	When the `Domestic hot water` > `Type` > `Reheat` or `Reheat + sched.` is selected, it is recommended to program the start-up of the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set via the installer settings (disinfection function). When the `Domestic hot water` > `Type` > `Scheduled only` is selected, it is recommended to program a `Storage eco` 3 hours before the scheduled start-up of the disinfection function to preheat the tank.
The disinfection operation was stopped manually: with the user interface displaying the DHW home page and its user permission level set to `Installer`, the ⏻ button was pressed during disinfection operation.	Do NOT press the ⏻ button while the disinfection function is active.

15.4.9 Symptom: Boiler abnormality detection (HJ-11 error)

Possible causes	Corrective action
Communication cable problem	Mount the communication cable between the gas boiler and the outdoor unit properly.
Boiler error	Check the boiler display for error information.

15.4.10 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.

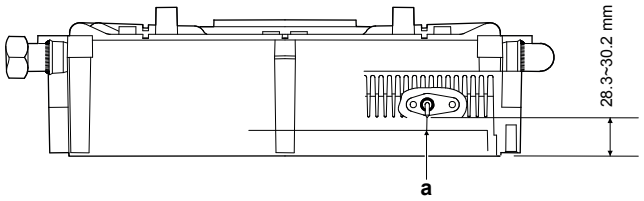
15.4.11 Symptom: The burner does NOT ignite

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.	▪ Check the cabling. ▪ Check the spark plug cap. ▪ Replace the ignition unit.
Gas/air adjustment NOT correctly set.	Check the adjustment. See "To check the carbon dioxide setting" on page 75.
Fan faulty.	▪ Check the wiring. ▪ Check the fuse. If necessary, replace the fan.
Fan dirty.	Clean the fan.
Gas valve faulty.	▪ Replace the gas valve. ▪ Re-adjust the gas valve, see "To check the carbon dioxide setting" on page 75.

15.4.12 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.	▪ Replace the ignition pin. ▪ Check the ignition electrode gap.
Gas/air adjustment NOT correctly set.	Check the setting. See "To check the carbon dioxide setting" on page 75.

Possible causes	Corrective action
Weak spark.	Check the ignition gap. Replace the ignition electrode. Replace the ignition unit on the gas valve.



a Spark gap (±4.5 mm)

15.4.13 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 "To check the carbon dioxide setting" on page 75.

15.4.14 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.
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 ⏻.
No current (24 V)	▪ Check the wiring. ▪ Check the connector X4.
The burner does NOT fire on space heating: sensor S1 or S2 faulty.	Replace sensor S1 or S2. See "Error codes of the gas boiler" on page 92.
Burner does NOT ignite.	See "15.4.11 Symptom: The burner does NOT ignite" on page 88.

15.4.15 Symptom: The power is reduced

Possible causes	Corrective action
At high rpm, the power has fallen by more than 5%.	▪ Check the appliance and flue system for fouling. ▪ Clean the appliance and flue system.

15.4.16 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 "Maximum space heating power setting" on page 75.
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.

15.4.17 Symptom: No domestic hot water

Not applicable for Switzerland

Possible causes	Corrective action
The burner is NOT firing on domestic hot water: S3 faulty.	Replace S3.
The burner does NOT ignite.	See "15.4.11 Symptom: The burner does NOT ignite" on page 88.

15.4.18 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.
The domestic hot water temperature fluctuates between hot and cold.	▪ The flow is too low. To guarantee comfort, a minimum water flow of 5 l/min is recommended. ▪ Increase the domestic hot water setpoint on the domestic hot water homepage of the user interface.

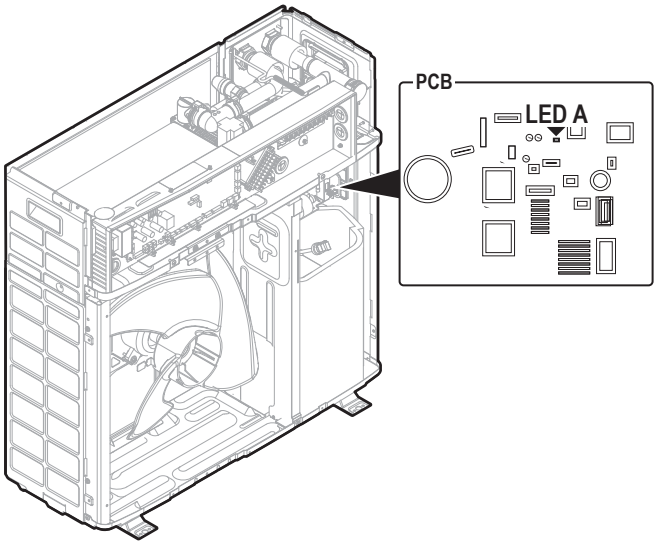
15.4.19 Symptom: Hot water does NOT reach the temperature (tank installed)

Possible causes	Corrective action
The gas boiler has an error code.	Check the display of the gas boiler for more information.
The outdoor unit has an error code.	Check for possible errors on the user interface.
The 3-way valve is not working correctly.	▪ Check the installation of the 3-way valve. ▪ In case of domestic hot water operation, the flow should be directed to the tank.

15.5 Solving problems based on LED behaviour

15.5.1 Location of the outdoor unit LED

Open the outdoor unit (see "9.2.2 To open the outdoor unit" on page 30). The following illustration indicates the location of the outdoor unit LED on the PCB:



15.5.2 To diagnose faults

LED behaviour

	Diagnosis	
◑	LED flashing	Normal
☼	LED on	(a)
●	LED off	Case 1: supply voltage (for power saving) Case 2: power supply fault Case 3(a)

(a) Follow the procedure below.

Check if the outdoor unit is faulty

1 Turn the power off and on again.

2 Check the LED within approximately 3 minutes.

If the LED behaviour recurs, the outdoor unit PCB is faulty.

Note: Error detection should be done by using the remote control fault diagnosis.

15.6 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.

For detailed troubleshooting of each error, see the service manual.

15.6.1 Error codes: Overview

Error codes of the outdoor unit

Refrigerant part

Error code	Detailed error code	Description
A5	00	OU: High pressure cooling/ Peak cut/ freeze protection problem. Please contact your dealer.
E1	00	OU: PCB defect. Power reset required. Please contact your dealer.
E3	00	OU: Actuation of high pressure switch (HPS). Please contact your dealer.
E5	00	OU: Overheat of inverter compressor motor. Please contact your dealer.
E6	00	OU: Compressor startup defect. Please contact your dealer.
E7	00	OU: Malfunction of outdoor unit fan motor. Please contact your dealer.
E8	00	OU: Power input overvoltage. Please contact your dealer.
EA	00	OU: Cool/heat switchover problem. Please contact your dealer.
H0	00	OU: Voltage/current sensor problem. Please contact your dealer.
H3	00	OU: Malfunction of high pressure switch (HPS) Please contact your dealer.
H6	00	OU: Malfunction of position detection sensor. Please contact your dealer.
H8	00	OU: Malfunction of compressor input (CT) system. Please contact your dealer.
H9	00	OU: Malfunction of outdoor air thermistor. Please contact your dealer.

Error code	Detailed error code	Description
F3	00	OU: Malfunction of discharge pipe temperature. Please contact your dealer.
F6	00	OU: Abnormal high pressure in cooling. Please contact your dealer.
FA	00	OU: Abnormal high pressure, actuation of HPS. Please contact your dealer.
JA	00	OU: Malfunction of high pressure sensor. Please contact your dealer.
J3	00	OU: Malfunction of discharge pipe thermistor. Please contact your dealer.
J6	00	OU: Malfunction of heat exchanger thermistor. Please contact your dealer.
J6	07	OU: Malfunction of heat exchanger thermistor. Please contact your dealer.
L3	00	OU: Electrical box temperature rise problem. Please contact your dealer.
L4	00	OU: Malfunction of inverter radiating fin temperature rise. Please contact your dealer.
L5	00	OU: Inverter instantaneous overcurrent (DC). Please contact your dealer.
P4	00	OU: Malfunction of radiating fin temperature sensor. Please contact your dealer.
U0	00	OU: Shortage of refrigerant. Please contact your dealer.
U2	00	OU: Defect of power supply voltage. Please contact your dealer.
U7	00	OU: Transmission malfunction between main CPU- INV CPU. Please contact your dealer.

Hydro part

Error code	Detailed error code	Description
80	00	Returning water temperature sensor problem. Please contact your dealer.
81	00	Leaving water temperature sensor problem. Please contact your dealer.
89	01	Heat exchanger frozen.
89	02	Heat exchanger frozen.
89	03	Heat exchanger frozen.
8F	00	Abnormal increase outlet water temperature (DHW).
8H	00	Abnormal increase outlet water temperature.
8H	03	Overheating water circuit (thermostat).
A1	00	Zero cross detection problem. Power reset required. Please contact your dealer.
A1	00	EEPROM reading error.
AA	01	Backup heater overheated. Power reset required. Please contact your dealer.
AC	00	Booster heater overheated. Please contact your dealer.
AH	00	Tank disinfection function not completed correctly.
AJ	03	Too long DHW heat-up time required.
C4	00	Heat exchanger temperature sensor problem. Please contact your dealer.

Error code	Detailed error code	Description
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.
HJ	11	Boiler abnormality detection Check boiler Refer to boiler manual
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.
U8	02	Connection with room thermostat lost
U8	08	Boiler communication malfunction
UA	00	Indoor unit, outdoor unit matching problem. Power reset required.
UA	52	Boiler, indoor unit matching problem. Please contact your dealer. See "15.4.10 Symptom: Boiler/ hydrobox combination abnormality (UA-52 error)" on page 88

INFORMATION

Error AJ-03 is reset automatically from the moment there is a normal tank heat-up.

INFORMATION

Error EC-04 is reset automatically from the moment the domestic hot water tank is preheated to a sufficiently high temperature.

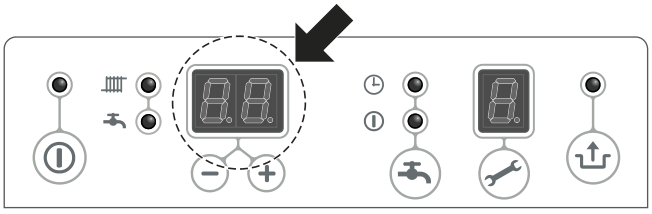
INFORMATION

If the unit detects flow when the pump is not running, an external device might be causing flow, or there might be something wrong with the flow measuring devices (flow sensor and flow switch).

- If the flow sensor detects flow when the pump is not running, the unit will stop operation and the user interface will display error C0-00. For the unit to resume operation, this error needs to be reset manually.
- If the flow switch detects flow when the pump is not running, the unit will temporarily stop operation and the user interface will display error C0-01. After some time, the error will reset automatically and the unit will resume operation. If the problem persists, the unit will stop operation and the user interface will display error C0-02. For the unit to resume operation, this error needs to be reset manually.

Error codes of the 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	▪ Check wiring ▪ Replace S1
20, 21, 22, 23, 24	Sensor fault S2	▪ Check wiring ▪ Replace S2
0	Sensor fault after self-check	Replace S1 and/or S2
1	Temperature too high	▪ Air in installation ▪ Pump is NOT running ▪ Insufficient flow in installation ▪ Radiators are closed ▪ Pump setting is too low
2	S1 and S2 interchanged	▪ Check cable set ▪ Replace S1 and S2

Error code	Cause	Possible solution
4	No flame signal	▪ Gas tap is closed ▪ No or incorrect ignition gap ▪ Gas supply pressure is too low or fails ▪ Gas valve or ignition unit is NOT powered
5	Poor flame signal	▪ Condensate drain blocked ▪ Check adjustment of gas valve
6	Flame detection fault	▪ Replace ignition cable and spark plug cap ▪ Replace ignition unit ▪ Replace boiler controller
8	Incorrect fan speed	▪ Fan catching on casing ▪ Wiring between fan and casing ▪ Check wiring for poor wire contact ▪ Replace fan
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.

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

Example: To protect the environment, pump down when disposing of the unit.

It is NOT required to pump down when relocating the unit.

DANGER: RISK OF EXPLOSION

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

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

NOTICE

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

Pump down operation will extract all refrigerant from the system into the outdoor unit (compressor module).

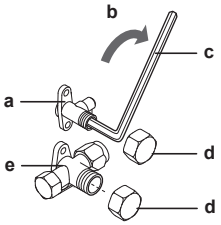
1 Remove the valve cap from the liquid stop valve and the gas stop valve.

2 On the user interface, start the pump down operation. Go to [A.6.E.1]: > `Installer settings` > `System operation` > `Pump down` > `Start pump down`.

3 After ±2 minutes, close the liquid stop valve with a hexagonal wrench.

4 Check on the manifold if the vacuum is reached.

5 After ±5 minutes, close the gas stop valve, and stop the pump down operation by pressing on the user interface.



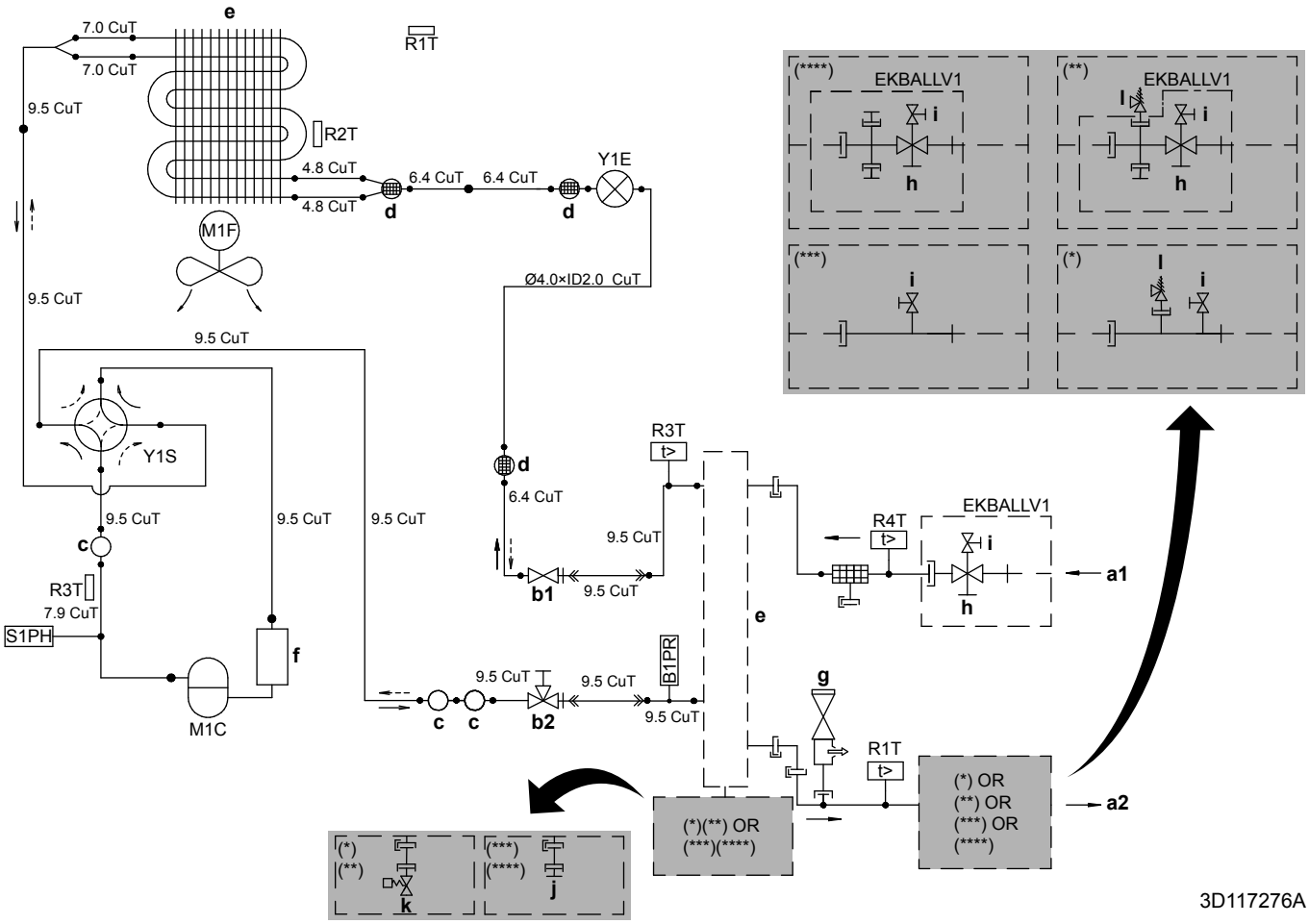
a Liquid stop valve
b Closing direction
c Hexagonal wrench
d Valve cap
e Gas stop valve

17 Technical data

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

17.1 Outdoor unit

17.1.1 Piping diagram: Outdoor unit



(*)	In case of water without glycol (without option EKBALLV1)
(**)	In case of water without glycol + option EKBALLV1
(***)	In case of water with glycol (without option EKBALLV1)
(****)	In case of water with glycol + option EKBALLV1
→	Heating
--→	Cooling (only pump down)
a1	Water IN
a2	Water OUT
b1	Stop valve (liquid refrigerant)
b2	Stop valve with service port (gas refrigerant)
c	Muffler
d	Muffler with filter
e	Heat exchanger
f	Accumulator
g	Safety valve
h	Shut-off valve
i	Air purge
j	Stop
k	Freeze protection valve
l	Vacuum breaker
B1PR	Refrigerant pressure sensor
EKBALLV1	Option EKBALLV1
M1C	Compressor
M1F	Fan
R1T	Thermistor (outdoor air)
R1T (t>)	Thermistor (water OUT)
R2T	Thermistor (heat exchanger)
R3T	Thermistor (compressor discharge)
R3T (t>)	Thermistor (liquid refrigerant)
R4T (t>)	Thermistor (water IN)
S1PH	High pressure switch
Y1E	Electronic expansion valve
Y1S	Solenoid valve (4-way valve)(ON: cooling)
	Screw connection
	Flare connection
	Quick coupling
	Brazed connection

17.1.2 Wiring diagram: Outdoor unit

See the internal wiring diagram supplied with the unit (on the inside of the front plate). The abbreviations used are listed below.

Outdoor unit: hydro module

(1) Connection diagram

English	Translation
Connection diagram	Connection diagram
Bivalent	Bivalent signal
Boiler box	Boiler box
Bottom plate heater option	Bottom plate heater
Continuous	Continuous current
DHW pump	Domestic hot water pump
DHW pump output	Domestic hot water pump output
External outdoor ambient sensor option	External outdoor temperature sensor
Hydro switch box	Hydro switch box
Indoor	Indoor
Inrush	Inrush current
LAN adapter	LAN adapter
Max. load	Maximum load
Normal kWh rate power supply	Normal kWh rate power supply
Only for dedicated gas boiler	Only in case of NHY2KOMB28+32AA gas boiler
Only for third-party gas boiler	Only in case of third-party gas boiler
Outdoor	Outdoor
Remote user interface	User interface

(2) Hydro switch box layout

English	Translation
Hydro switch box layout	Hydro switch box layout

(3) Notes

English	Translation
Notes	Notes
User installed options	User installed options
☐ LAN adapter	☐ LAN adapter
☐ Main supply pump	☐ Main supply pump (= external pump)
☐ Ext outdoor thermistor	☐ External outdoor temperature sensor
☐ Bottom plate heater	☐ Bottom plate heater
X2M	Main terminal
—·—·—·—	Earth wiring
15	Wire number 15
– – – – – – –	Field supply
①	Several wiring possibilities
	Option
	Wiring depending on model
	Switch box
	PCB

1 Colours: BLK: black; RED: red; BLU: blue; WHT: white; GRN: green; ORG: orange; YLW: yellow; GRY: grey; BRN: brown

(4) Legend

Legend	Legend
A1P		Main PCB
A13P	*	LAN adapter
A14P	#	User interface PCB
E2H	*	Bottom plate heater
FU3	*	Fuse
M1P	*	Main supply pump (= external pump)
M2P	#	Domestic hot water pump
Q1DI	#	Earth leakage circuit breaker
R6T	*	External outdoor temperature sensor
X*A		Connector
X*M		Terminal strip

* Optional
\# Field supply

Outdoor unit: compressor module

(1) Connection diagram

English	Translation
Connection diagram	Connection diagram
Hydro switch box	Hydro switch box
Outdoor	Outdoor

(2) Layout

English	Translation
Layout	Layout

(3) Notes

English	Translation
Notes	Notes
	Connection
X1M	Main terminal
—·—·—·—	Earth wiring
– – – – – – –	Field supply
⏚	Protective earth
	Option
	Switch box
	PCB
	Wiring depending on model
⏚	Earth

NOTES:

1 When operating, do not short-circuit protection device S1PH.

2 Colours: BLK: black; RED: red; BLU: blue; WHT: white; GRN: green; ORG: orange; YLW: yellow; GRY: grey; BRN: brown

(4) Legend

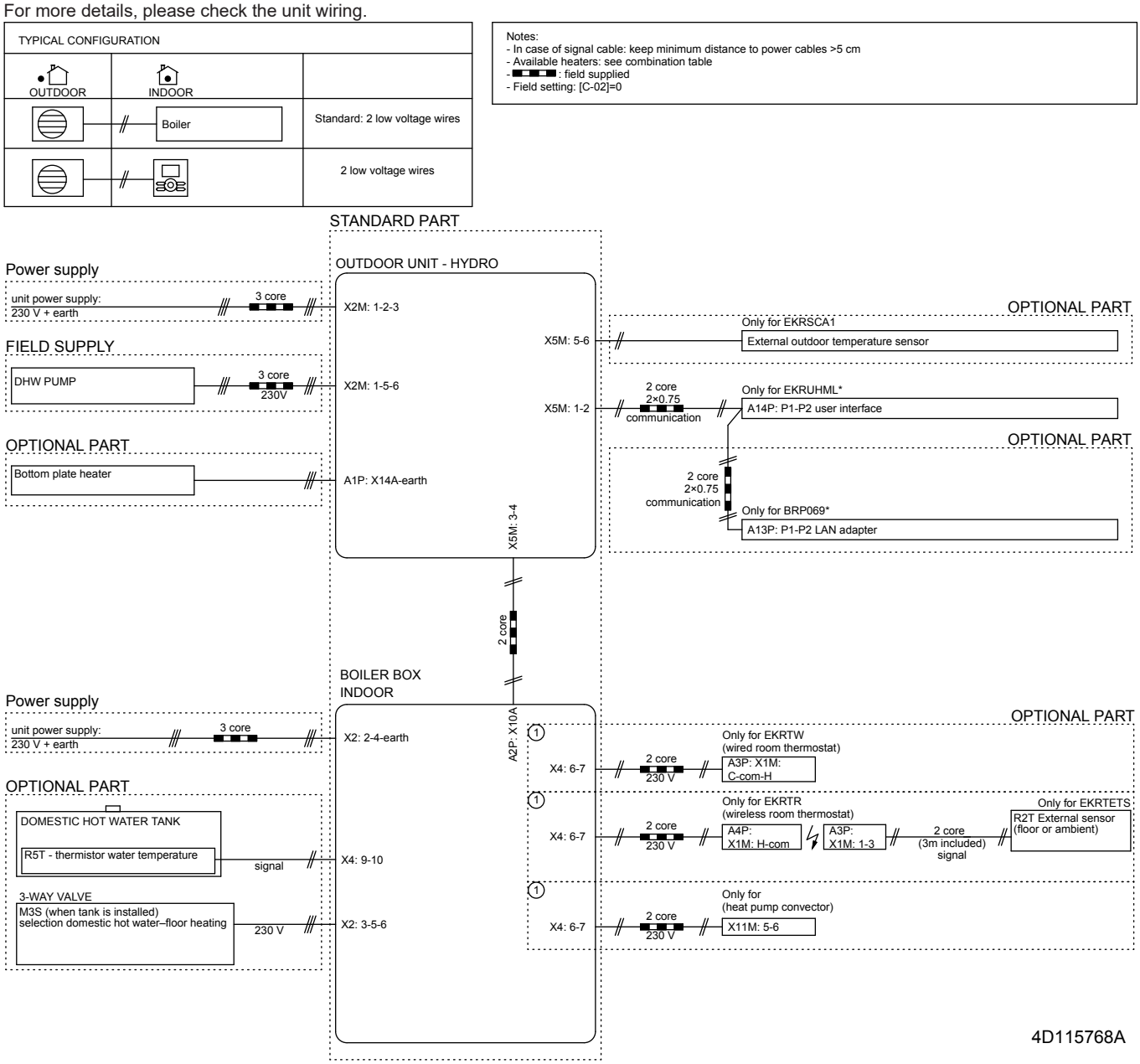
Legend	Legend
C7 (PCB1)	Capacitor
DB1 (PCB1)	Rectifier bridge
E1, E2 (PCB1)	Connector
FU1 (PCB1)	Fuse T 3.15 A 250 V
FU2 (PCB1)	Fuse T 3.15 A 250 V
FU3 (PCB1)	Fuse T 20 A 250 V
H*1 (PCB1)	Connector
IPM1 (PCB1)	Intelligent power module
MRCW (PCB1)	Magnetic relay (Y1S)

MRM*, MR30 (PCB1)	Magnetic relay
M1C	Compressor motor
M1F	Fan motor
PAM (PCB1)	Pulse-amplitude modulation
PCB1	Printed circuit board (main)
PS (PCB1)	Switching power supply
Q1L	Thermal protector
R1T	Thermistor (outdoor air)
R2T	Thermistor (heat exchanger)
R3T	Thermistor (compressor discharge)

S1PH	High pressure switch
SA1 (PCB1)	Surge arrestor
S* (PCB1)	Connector
U, V, W (PCB1)	Connector
V* (PCB1)	Varistor
X11A	Connector
X*M	Terminal strip
Y1E	Electronic expansion valve
Y1S	Solenoid valve (4-way valve)
Z*C	Noise filter (ferrite core)
Z1F (PCB1)	Noise filter

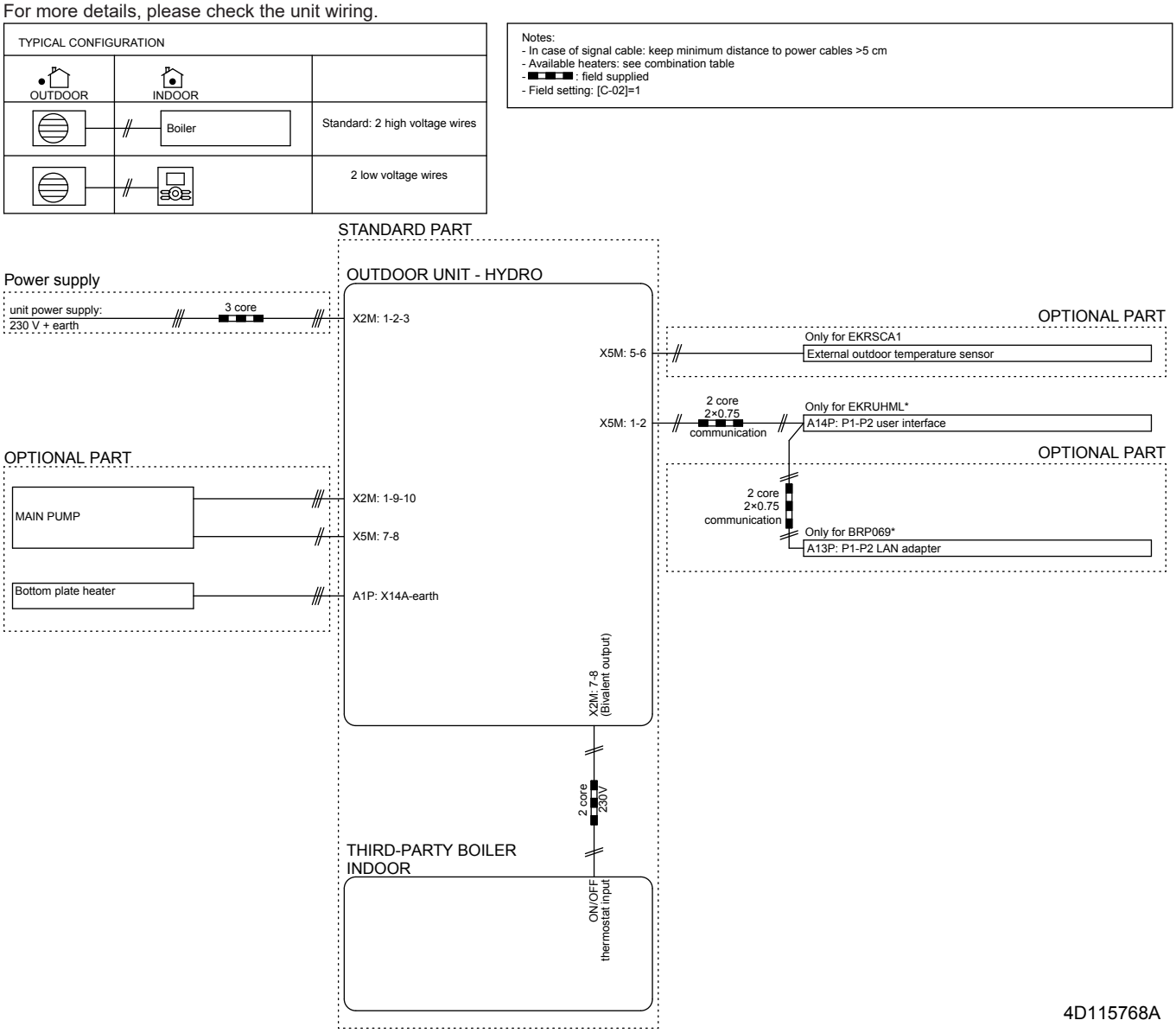
Electrical connection diagram in case of NHY2KOMB28+32AA gas boiler

For more details, please check the unit wiring.



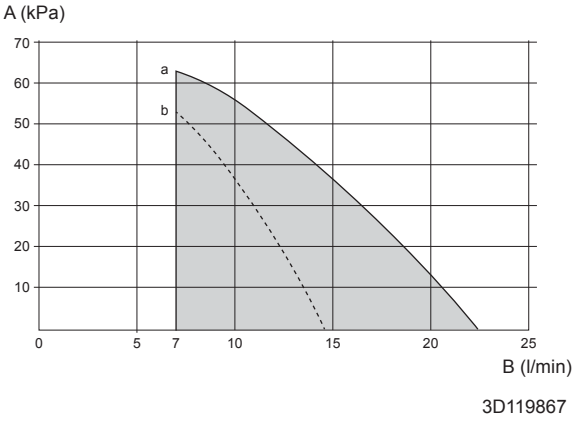
Electrical connection diagram in case of third-party gas boiler

For more details, please check the unit wiring.



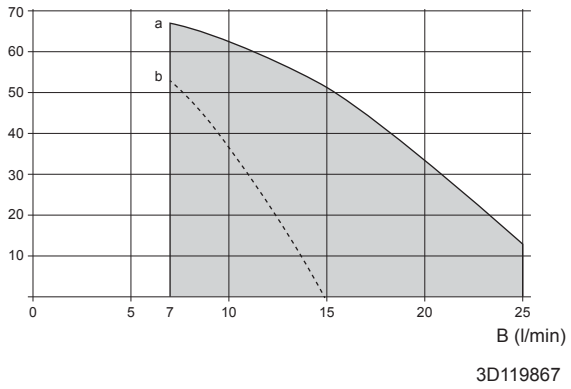
17.1.3 ESP curve: Outdoor unit

For NHY2KOMB28+32AA:



A External static pressure
B Water flow rate
a Maximum ESP (Ø1" 1 meter <-->)
b Minimum ESP (Ø1" 89 meter <-->)

For third-party gas boiler:



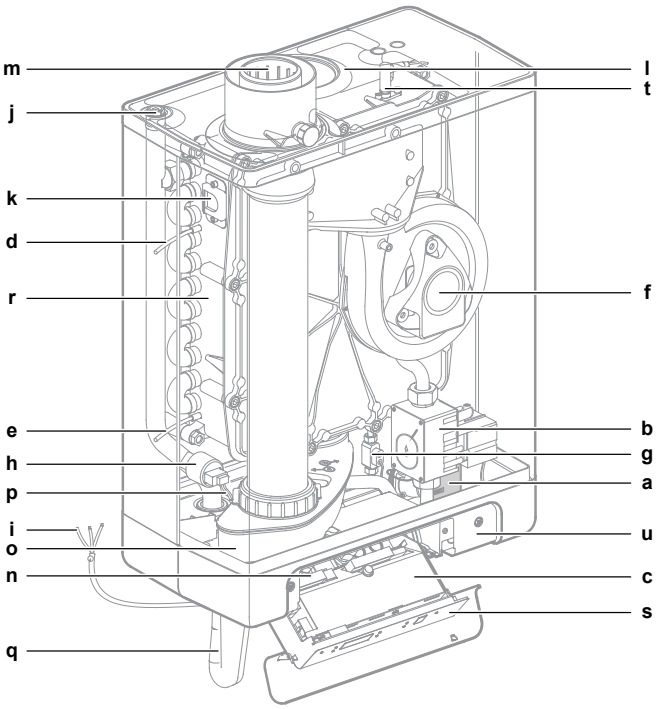
A External static pressure
B Water flow rate
a Maximum ESP range (Ø1" 1 meter <-->)
b Minimum ESP (Ø1" 123 meter <-->)

Notes:

- The upper operation range is only valid if the flow medium is water. If glycol is added to the system, the operation range limit is lower.
- Selecting a flow outside the operating area can damage the unit or cause the unit to malfunction.

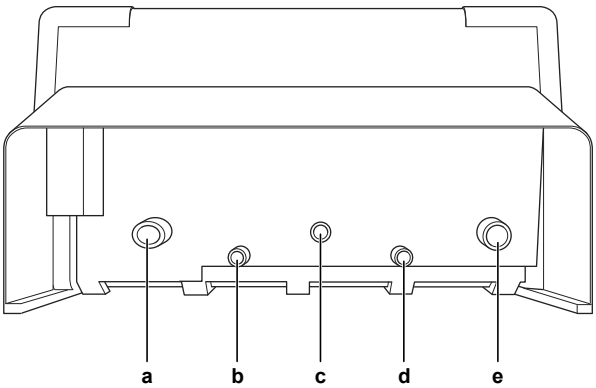
17.2 Gas boiler

17.2.1 Components: Gas boiler



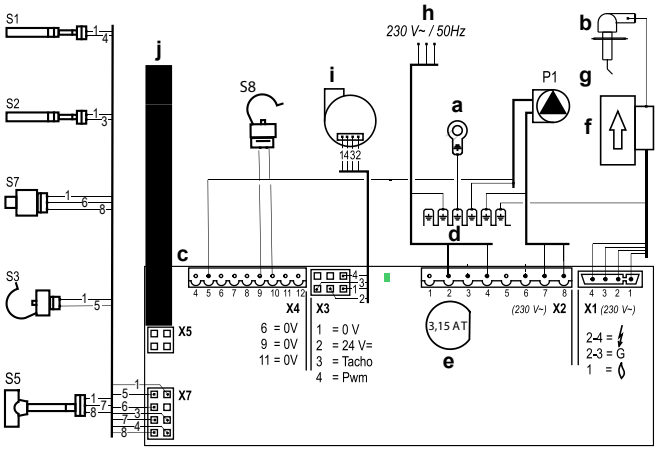
a Space heating pump
b Gas valve
c Boiler control panel
d Sensor S1 (in)
e Sensor S2 (out)
f Fan
g Flow sensor
h Space heating pressure sensor
i Mains lead 230 V AC with earthed plug
j Manual air bleed
k Sight glass
l Air supply cap (use ONLY when using twin pipe flue system)
m Flue pipe adapter (use ONLY in combination with the accompanying elbow in flue sets)
n Connection block/terminal strip X4
o Condensate drain pan
p Domestic Hot water sensor S3
q Condensate S3
r Heat exchanger
s Operating panel and read-out
t Ionisation/ignition electrode
u Position of data plate

Bottom view



a Space heating outlet
b Instant domestic hot water outlet (not applicable for Switzerland)
c Gas inlet
d Instant domestic hot water inlet (not applicable for Switzerland)
e Space heating inlet

17.2.2 Wiring diagram: Gas boiler



a Earth connection heat exchanger
b Spark cover
c Boiler controller
d Earth lips boiler controller
e Fuse (3.15 A T)
f Gas valve and ignition unit
g Ignition/ionisation pin
h Main voltage
i Fan
j Current loop module
P1 Space heating pump
S1 Supply sensor
S2 Return sensor
S3 Domestic hot water sensor (not applicable for Switzerland)
S5 Flow sensor
S7 Space heating water pressure sensor
S8 Space heating leaving water thermistor
X1 Gas valve and ignition electrode
X2 Main power supply (2=L (BRN), 4=N (BLU))
X3 Power supply fan (230 V)
X4 Sensor connection
X5 Boiler communication cable
X7 Sensor connection

17.2.3 Technical specifications: Gas boiler

General

Technical data	NHY2KOMB28AA	NHY2KOMB32AA
Function	Heating – Domestic hot water	
Initial gas pressure	G20 – 20 mbar; G31: 28-50 mbar	
Suitable for gas	UK, IT : II2H3P FR : II2Esi3P DE : II2ELL3P	
Domestic water (not applicable for Switzerland)		
Heating power domestic hot water	7.2~29.1 kW	7.6~32.7 kW
Domestic hot water flow rate (setpoint 60°C)	7.5 l/min	9 l/min
Domestic hot water flow rate (setpoint 40°C)	12.5 l/min	15 l/min
Maximum water pressure	8 bar	
Efficiency domestic hot water (net calorific value)	105%	
Operation range	40~65°C	
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" on page 77.	
Space heating		
Nominal load: upper value[(a)]	8.0~26.3 kW	8.3~30.0 kW
Nominal load: lower value[(a)]	7.1~23.7 kW	7.6~27.0 kW
Output at 80/60°C Min - Nom	7,1~23.1 kW	7.4~26.6 kW
Output at 50/30°C Min - Nom	7,7~25.4 kW	8.2~28.9 kW
Nominal output	7.7~23.1 kW	8.2~26.6 kW
Efficiency space heating (net calorific value 80/60)	97%	98%
Efficiency space heating (net calorific value 37/30 (30%))	>107%	
Operation range	30~90°C	
Pressure drop	See ESP curve in the installer reference guide.	
Maximum space heating water pressure	3 bar	
Maximum space heating water temperature	90°C	
Heat pump module	EJHA04AAV3	
Device category	B23, B33, C13(x), C33(x), C43(x), C53(x), C63(x), C83(x), C93(x)	
Gas		
Gas consumption (G20)	0.74~3.02 m^3/h	0.79~3.39 m^3/h
Gas consumption (G25)	0.84~3.46 m^3/h	0.89~3.92 m^3/h
Gas consumption (G31)	0.28~1.15 m^3/h	0.30~1.29 m^3/h
Maximum flue gas temperature domestic hot water	70°C	
Massive flow glue gas (maximum)	13.6 g/s	15.3 g/s
Available fan pressure	75 Pa	
NOx class	6	
Casing		
Colour	White – RAL9010	
Material	Pre-coated sheet metal	
Dimensions		
Packing (H×W×D)	760×490×270 mm	820×490×270 mm
Unit (H×W×D)	650×450×240 mm	710×450×240 mm
Machine net weight	33 kg	36 kg
Packed machine weight	34 kg	37 kg
Packing material	Carton/PP (straps)	
Packing material (weight)	1 kg	
Main components		
Water side heat exchanger	Aluminium, copper	
Space heating water circuit		

Technical data	NHY2KOMB28AA	NHY2KOMB32AA
Space heating piping connections	Ø22 mm	
Piping material	Copper	
Safety valve	Not included	
Manometer	Yes	
Drain/fill valve	No (optional in connection set)	
Shut-off valves	No (optional in connection set)	
Air purge valve	Yes (manual)	
Maximum pressure space heating circuit	3 bar	
Domestic hot water circuit (not applicable for Switzerland)		
Domestic hot water piping connections	Ø15 mm	
Piping material	Copper	
Gas connection	Ø15 mm	
Flue gas/combustion air connection	Concentric connection Ø60/100 mm	
Electrical		
Power supply voltage	230 V	
Power supply phase	1~	
Power supply frequency	50 Hz	
IP class	IP44 (B23, B33=IP20)	
Maximum electrical power consumption	110 W	
Electrical power consumption (standby)	2 W	
Radio module		
Power supply	230 V AC mains powered	
Frequency range	868.3 MHz	
Effective Radiated Power (ERP)	12.1 dBm	

(a) Maximum space heating power is set at the factory at 60% of the highest value

Energy-related products specifications

Technical data	NHY2KOMB28AA	NHY2KOMB32AA
Condensing boiler	Yes	
Low-temperature boiler	No	
B1 boiler	No	
Cogeneration space heater	No	
Combination heater	Yes	
Space heating efficiency class	A	
Rated heat output (P_{rated})	23 kW	27 kW
Useful heat output at 30% of rated heat output and low-temperature regime	7.7 kW	8.8 kW
Seasonal space heating energy efficiency	93%	
Useful efficiency at rated heat output and high-temperature regime	87.8%	88.9%
Useful efficiency at 30% of rated heat output and low-temperature regime	97.2%	97.6%
Auxiliary electricity consumption		
At full load (el_{max})	0.045 kW	
At part load (el_{min})	0.015 kW	
In standby mode (P_{SB})	0.002 kW	
Other items		
Standby heat loss (P_{stby})	0.038 kW	
Ignition burner power consumption (P_{ign})	n/a	
Annual energy consumption (Q_{HE})	69 GJ	80 GJ
Sound power level, indoors (at maximum heat output) (L_{WA})	45 dB	50 dB
Emissions of nitrogen oxides (NO_X)	49 mg/kWh	53 mg/kWh
Domestic hot water parameters		

17 Technical data

Technical data	NHY2KOMB28AA	NHY2KOMB32AA
Declared load profile	XL	
Daily electricity consumption	0.077 kWh	0.073 kWh
Annually electricity consumption	17 kWh	16 kWh
Water heating energy efficiency	87%	
Water heating energy efficiency class	A	
Daily fuel consumption	22.61 kWh	22.51 kWh
Annual fuel consumption	4975 kWh	4952 kWh

Gas category and supply pressure

Country	Gas category	Default setting	After conversion to G25	After conversion to G31
Germany	II2ELL3P	G20 (20 mbar)	G25 (25 mbar)	G31 (28~50 mbar)
Belgium[1]	I2E(s)3Pc, I3P	G20 (20 mbar)	G25 (25 mbar)	G31 (30 mbar)
France	II2Esi3P	G20 (20 mbar)	G25 (25 mbar)	G31 (30 mbar)
Italy	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)
United Kingdom	II2H3P	G20 (20 mbar)	—	G31 (30~37 mbar)
Spain	II2H3P	G20 (20 mbar)	—	G31 (30~37 mbar)
Austria	II2H3P	G20 (20 mbar)	—	G31 (30~50 mbar)
Bulgaria	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)
Czech Republic	II2H3+, II2H3P	G20 (20 mbar)	—	G31 (37 mbar)
Croatia	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)
Hungary	II2HS3P	G25 (25 mbar)	—	G31 (30 mbar)
Slovakia	II2H3P	G20 (20 mbar)	—	G31 (30~50 mbar)
Slovenia	II2H3P	G20 (20 mbar)	—	G31 (37 mbar)
Portugal	II2H3+	G20 (20 mbar)	—	G31 (37 mbar)
Greece	II2H3+	G20 (20 mbar)	—	G31 (37 mbar)
Cyprus	II2H3+	G20 (20 mbar)	—	G31 (37 mbar)
Poland	II2H3P	G20 (20 mbar)	—	G31 (37 mbar)
Ireland	II2H3+	G20 (20 mbar)	—	G31 (37 mbar)
Turkey	II2H3+	G20 (20 mbar)	—	G31 (37 mbar)
Switzerland	II2H3+	G20 (20 mbar)	—	G31 (37 mbar)
Malta	I3P	—	—	G31 (30 mbar)
Lithuania	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)
Latvia	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)
Denmark	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)
Romania	II2H3P	G20 (20 mbar)	—	G31 (30 mbar)

(1) Any modifications to the gas valve MUST be performed by a certified representative of the manufacturer. For more information, contact your dealer.

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:
To be completed by the customer on receipt of a Building Regulations Compliance Certificate*	
Building Regulations Notification Number (if applicable):	

CONTROLS (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	

ALL SYSTEMS				
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	

CENTRAL HEATING MODE measure and record:			
Gas rate	m^3/hr	**OR**	ft^3/hr
Burner operating pressure (if applicable)	mbar	**OR** Gas inlet pressure	mbar
Central heating flow temperature			°C
Central heating return temperature			°C

COMBINATION BOILERS ONLY			
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?			
DOMESTIC HOT WATER MODE Measure and Record:			
Gas rate	m^3/hr	**OR**	ft^3/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

CONDENSING BOILERS ONLY	
The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798	Yes

ALL INSTALLATIONS							
Record the following:	At max. rate:	CO	ppm	**AND**	CO/CO_2	Ratio	
	At min. rate: (where possible)	CO	ppm	**AND**	CO/CO_2	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.

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

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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.

SERVICE 01						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 02						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 03						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 04						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 05						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 06						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 07						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 08						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 09						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
Comments:						
Signature						

SERVICE 10						Date:
Engineer name:						
Company name:						
Telephone No:						
Gas safe register No:						
Record:	At max. rate:	CO	ppm	**AND**	CO_2 %	
	At min. rate: (Where Possible)	CO	ppm	**AND**	CO_2 %	
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.

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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

EHY2KOMB28AA
EHY2KOMB32AA

NHY2KOMB28AA
NHY2KOMB32AA

Notes

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Field settings table

Breadcrumb	Field code	Setting name			Range, step **Default value**	Installer setting at variance with default value Date	 Value
User settings							
└ Preset values							
└ Room temperature							
7.4.1.1		Comfort (heating)		R/W	[3-07]~[3-06], step: A.3.2.4 **21°C**		
7.4.1.2		Eco (heating)		R/W	[3-07]~[3-06], step: A.3.2.4 **21°C**		
└ LWT main							
7.4.2.1	[8-09]	Comfort (heating)		R/W	[9-01]~[9-00], step: 1°C **45°C**		
7.4.2.2	[8-0A]	Eco (heating)		R/W	[9-01]~[9-00], step: 1°C **40°C**		
7.4.2.5		Comfort (heating)		R/W	-10~10°C, step: 1°C **0°C**		
7.4.2.6		Eco (heating)		R/W	-10~10°C, step: 1°C **-2°C**		
└ Tank temperature							
7.4.3.1	[6-0A]	Storage comfort		R/W	30~[6-0E]°C, step: 1°C **60°C**		
7.4.3.2	[6-0B]	Storage eco		R/W	30~min(50, [6-0E]) °C, step: 1°C **50°C**		
7.4.3.3	[6-0C]	Reheat		R/W	30~min(50, [6-0E]) °C, step: 1°C **50°C**		
└ Quiet level							
7.4.4				R/W	0: Level 1 **1: Level 2** 2: Level 3		
└ Electricity price							
7.4.5.1		High		R/W	0,00~990/kWh **0,01/kWh**		
7.4.5.2		Medium		R/W	0,00~990/kWh **0,01/kWh**		
7.4.5.3		Low		R/W	0,00~990/kWh **0,01/kWh**		
└ Fuel price							
7.4.6				R/W	0,00~990/kWh 0,00~290/MBtu **8,0/kWh**		
└ Set weather dependent							
└ Main							
└ Set weather-dependent heating							
7.7.1.1	[1-00]	Set weather-dependent heating	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
7.7.1.1	[1-01]	Set weather-dependent heating	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15**°C		
7.7.1.1	[1-02]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00]°C, step: 1°C **55°C**		
7.7.1.1	[1-03]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45,[9-00])°C, step: 1°C **25°C**		
Installer settings							
└ System layout							
└ Standard							
A.2.1.1	[E-00]	Unit type		R/O	0~6 **6: Monobloc Hybrid**		
A.2.1.2	[E-01]	Compressor type		R/O	**0: 08**		
A.2.1.3	[E-02]	Indoor software type		R/O	0: Type 1 **1: Type2**		
A.2.1.7	[C-07]	Unit control method		R/W	0: LWT control 1: Ext RT control **2: RT control**		
A.2.1.9	[F-0D]	Pump operation mode		R/W	0: Continuous 1: Sample **2: Request**		
A.2.1.A	[E-04]	Power saving possible		R/O	**1: Yes**		
A.2.1.B		User interface location		R/W	**0: At unit** 1: In room		
A.2.1.C	[E-0D]	Glycol setting		R/W	**0: No** 1: Yes		
A.2.1.D	[4-04]	Water pipe freeze prevention		R/O	**0: intermittent pump operation** 1: Continuous pump operation 2: OFF		
A.2.1.E	[C-02]	Hybrid system type		R/W	0: Boiler **1: Bivalent boiler**		
└ Options							
A.2.2.1	[E-05]	DHW operation		R/W	**0: No** 1: Yes		
A.2.2.2	[E-06]	DHW tank		R/W	**0: No** 1: Yes		
A.2.2.3	[E-07]	DHW tank type		R/W	0~6 0: Type1(EKHWS*D*) **4: Type 5(EKHWP*)** 6: Type 7(Third party)		
A.2.2.4	[C-05]	Contact type main		R/W	**1: Thermo ON/OFF** 2: C/H request		
A.2.2.A	[D-02]	DHW pump		R/W	**0: No** 1: Secondary rtrn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.2.2.B	[C-08]	External sensor		R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
A.2.2.G		LAN Adapter		R/W	**0: No** 1: Yes		
A.2.2.H	[F-04]	Electric heaters		R/W	**0: No** 1: BPH only 2: BPH+DTH Type1 3: BPH+DTH Type2 4: BPH+DTH Type3		
└ Space operation							
└ LWT settings							
└ Main							

Field settings table

Breadcrumb	Field code	Setting name			Range, step **Default value**	Installer setting at variance with default value Date	 Value
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 **55°C**		
A.3.1.1.5	[8-05]	Modulated LWT		R/W	0: No **1: Yes**		
A.3.1.1.7	[2-0C]	Emitter type		R/W	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
			└ Delta T source				
A.3.1.3	[1-0B]	Heating		R/W	3~66°C, step: 1°C **10°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.3.2.4		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 **35°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**		
A.5.2.3	[8-0E]	Boiler only ambient temp.		R/W	-15~25°C, step: 1°C **-5°C**		
	└ System operation						
		└ Auto restart					
A.6.1	[3-00]			R/W	0: No **1: Yes**		
		└ Pwr consumpt. Control					
A.6.3.1	[4-08]	Mode		R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
A.6.3.2	[4-09]	Type		R/W	0: Current **1: Power**		
A.6.3.3	[5-05]	Amp. value		R/W	0~50 A, step: 1 A **50 A**		
A.6.3.4	[5-09]	kW value		R/W	0~20 kW, step: 0,5 kW **20 kW**		
		└ Averaging time					
A.6.4	[1-0A]			R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
		└ Ext amb. sensor offset					
A.6.5	[2-0B]			R/W	-5~5°C, step: 0,5°C **0°C**		
		└ Savings mode					
A.6.7	[7-04]			R/W	**0: Economical** 1: Ecological		
		└ Emergency					
A.6.C				R/W	**0: Manual** 1: Automatic		
		└ Disable protective Function					

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.6.D		Disable protections	R/W	**0: No** 1: Yes		
	└ Overview settings					
A.8	[0-00]	--		**35°C**		
A.8	[0-01]	--		**55°C**		
A.8	[0-02]	--		**15°C**		
A.8	[0-03]	--		**-10°C**		
A.8	[0-04]	--		**8°C**		
A.8	[0-05]	--		**12°C**		
A.8	[0-06]	--		**35°C**		
A.8	[0-07]	--		**20°C**		
A.8	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
A.8	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C**		
A.8	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00]°C, step: 1°C **55°C**		
A.8	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45,[9-00])°C, step: 1°C **25°C**		
A.8	[1-04]	--		**1**		
A.8	[1-05]	--		**1**		
A.8	[1-06]	--		**20°C**		
A.8	[1-07]	--		**35°C**		
A.8	[1-08]	--		**22°C**		
A.8	[1-09]	--		**18°C**		
A.8	[1-0A]	What is the averaging time for the outdoor temp?	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
A.8	[1-0B]	What is target delta T in heating?	R/W	3~66°C, step: 1°C **10°C**		
A.8	[2-00]	When should the disinfection function be executed?	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
A.8	[2-01]	Should the disinfection function be executed?	R/W	**0: No** 1: Yes		
A.8	[2-02]	When should the disinfection function start?	R/W	0~23 hour, step: 1 hour **23**		
A.8	[2-03]	What is the disinfection target temperature?	R/W	fixed value **60°C**		
A.8	[2-04]	How long must the tank temperature be maintained?	R/W	40~60 min, step: 5 min **40 min**		
A.8	[2-05]	Room antifrost temperature	R/W	4~16°C, step: 1°C **8°C**		
A.8	[2-06]	Room frost protection	R/W	0: Disabled **1: Enabled**		
A.8	[2-09]	--		**0°C**		
A.8	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[2-0C]	What emitter type is connected ' (T2043.1)'to the main LWT zone	R/W	0: Underfloor heating 1: Fancoil unit **2: Radiator**		
A.8	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
A.8	[3-01]	--		**0**		
A.8	[3-02]	--		**1**		
A.8	[3-03]	--		**4**		
A.8	[3-04]	--		**2**		
A.8	[3-05]	--		**1**		
A.8	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: A.3.2.4 **30°C**		
A.8	[3-07]	What is the mimimum desired room temperature in heating?	R/W	12~18°C, step: A.3.2.4 **12°C**		
A.8	[3-08]	--		**35°C**		
A.8	[3-09]	--		**15°C**		
A.8	[4-00]	--		**1**		
A.8	[4-01]	--		**0**		
A.8	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~35°C, step: 1°C **35°C**		
A.8	[4-03]	--		**3**		
A.8	[4-04]	Is the pump allowed during pipe freeze prevention?	R/O	**0: intermittent pump operation** 1: Continuous pump operation 2: OFF		
A.8	[4-05]	--		**0**		
A.8	[4-06]	-- (Do not change this value)		**0**		
A.8	[4-07]	--		**0**		
A.8	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
A.8	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
A.8	[4-0A]	--		**0**		
A.8	[4-0B]	--		**1°C**		
A.8	[4-0D]	--		**3°C**		
A.8	[5-00]	Is boiler operation allowed above equilibrium temperature during space heating operation?		**1**		
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**		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.8	[5-03]	--		**0**		
A.8	[5-04]	--		**10**		
A.8	[5-05]	--		**50 A**		
A.8	[5-06]	--		**50 A**		
A.8	[5-07]	--		**50 A**		
A.8	[5-08]	--		**50 A**		
A.8	[5-09]	--		**20 kW**		
A.8	[5-0A]	--		**20 kW**		
A.8	[5-0B]	--		**20 kW**		
A.8	[5-0C]	--		**20 kW**		
A.8	[5-0D]	--		**0**		
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	[6-08]	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: Scheduled only**		
A.8	[6-0E]	What is the maximum temperature setpoint?	R/W	[E-06]=1 [E-07] = 0: 40~70°C, step: 1°C, 70°C [E-07] = 4: 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**		
A.8	[7-00]	--		**0**		
A.8	[7-01]	--		**2**		
A.8	[7-02]	--		**0**		
A.8	[7-03]	PE factor	R/W	0~6, step: 0,1 **2,5**		
A.8	[7-04]	Savings mode	R/W	**0: Economical** 1: Ecological		
A.8	[7-05]	--		**0**		
A.8	[8-00]	Minimum running time for domestic hot water operation.	R/W	0~20 min, step 1 min **1 min**		
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 **0,5 hour**		
A.8	[8-03]	--		**50**		
A.8	[8-04]	--		**95**		
A.8	[8-05]	Allow modulation of the LWT to control the room temp?	R/W	0: No **1: Yes**		
A.8	[8-06]	Leaving water temperature maximum modulation.	R/W	0~10°C, step: 1°C **5°C**		
A.8	[8-07]	--		**18°C**		
A.8	[8-08]	--		**20°C**		
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]	--		**13**		
A.8	[8-0C]	--		**10**		
A.8	[8-0D]	--		**16**		
A.8	[8-0E]	What is the ambient temp for boiler only operation?	R/W	-15~25°C, step: 1°C **-5°C**		
A.8	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	37~80°C, step: 1°C **55°C**		
A.8	[9-01]	What is the mimimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
A.8	[9-02]	--		**22°C**		
A.8	[9-03]	--		**5°C**		
A.8	[9-04]	--		**1**		
A.8	[9-05]	--		**25°C**		
A.8	[9-06]	--		**55°C**		
A.8	[9-07]	--		**5°C**		
A.8	[9-08]	--		**22°C**		
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**		
A.8	[9-0E]	--		0~8,step:1 **6**		
A.8	[A-00]	--		**0**		
A.8	[A-01]	--		**0**		
A.8	[A-02]	--		**0**		
A.8	[A-03]	--		**0**		
A.8	[A-04]	--		**0**		
A.8	[B-00]	--		**0**		
A.8	[B-01]	--		**0**		
A.8	[B-02]	--		**0**		
A.8	[B-03]	--		**0**		
A.8	[B-04]	--		**0**		
A.8	[C-00]	Domestic heating water priority.	R/W	**0: Solar priority** 1: Heat pump priority		
A.8	[C-01]	--		**0**		
A.8	[C-02]	What is the boiler system type?	R/W	0: Boiler **1: Bivalent boiler**		
A.8	[C-03]	Bivalent activation temperature.	R/W	-25~25°C, step: 1°C **0°C**		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.8	[C-04]	Bivalent hysteresis temperature.	R/W	2~10°C, step 1°C **3°C**		
A.8	[C-05]	What is the thermo request contact type for the main zone?	R/W	**1: Thermo ON/OFF** 2: C/H request		
A.8	[C-06]	--		**1**		
A.8	[C-07]	What is the unit control method in space operation?	R/W	0: LWT control 1: Ext RT control **2: RT control**		
A.8	[C-08]	Which type of external sensor is installed?	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
A.8	[C-09]	--		**0**		
A.8	[C-0A]	Indoor quick heat-up function	R/W	0: Disable **1: Enable**		
A.8	[C-0B]	Is Delta T control enabled?		0: Disable **1: Enable**		
A.8	[C-0C]	High electricity price decimal (Do not use)	R/W	0~7 **4**		
A.8	[C-0D]	Medium electricity price decimal (Do not use)	R/W	0~7 **4**		
A.8	[C-0E]	Low electricity price decimal (Do not use)	R/W	0~7 **4**		
A.8	[D-00]	--		**0**		
A.8	[D-01]	--		**0**		
A.8	[D-02]	Which type of DHW pump is installed?	R/W	**0: No** 1: Secondary rtrn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.8	[D-03]	Leaving water temperature compensation around 0°C.	R/W	**0: Disabled** 1: Enabled, shift 2°C (from -2 to 2°C) 2: Enabled, shift 4°C (from -2 to 2°C) 3: Enabled, shift 2°C (from -4 to 4°C) 4: Enabled, shift 4°C (from -4 to 4°C)		
A.8	[D-04]	--		**0**		
A.8	[D-05]	--		**1**		
A.8	[D-07]	--		**0**		
A.8	[D-08]	--		**0**		
A.8	[D-09]	--		**0**		
A.8	[D-0A]	Is an external gas meter used for power measurement?	R/W	**0: Not present** 1: 1 /m³ 2: 10 /m³ 3: 100 /m³		
A.8	[D-0B]	--		**2**		
A.8	[D-0C]	What is the high electricity price (Do not use)	R/W	0~49 **20**		
A.8	[D-0D]	What is the medium electricity price (Do not use)	R/W	0~49 **20**		
A.8	[D-0E]	What is the low electricity price (Do not use)	R/W	0~49 **15**		
A.8	[E-00]	Which type of unit is installed?	R/O	0~6 **6: Monobloc Hybrid**		
A.8	[E-01]	Which type of compressor is installed?	R/O	**0: 08**		
A.8	[E-02]	What is the indoor unit software type?	R/O	0: Type 1 **1: Type2**		
A.8	[E-03]	--		**0**		
A.8	[E-04]	Is the power saving function available on the outdoor unit?	R/O	**1: Yes**		
A.8	[E-05]	Can the system prepare domestic hot water?	R/W	**0: No** 1: Yes		
A.8	[E-06]	Is a DHW tank installed in the system?	R/W	**0: No** 1: Yes		
A.8	[E-07]	What kind of DHW tank is installed?	R/W	0~6 0: Type1(EKHWS*D*) **4: Type 5(EKHWP*)** 6: Type 7(Third party)		
A.8	[E-08]	Power saving function for outdoor unit.	R/W	0: Disabled **1: Enabled**		
A.8	[E-09]	--		**0**		
A.8	[E-0A]	--		**0**		
A.8	[E-0B]	--		**0**		
A.8	[E-0C]	--		**0**		
A.8	[E-0D]	Is the system filled with glycol?	R/W	**0: No** 1: Yes		
A.8	[F-00]	Pump operation allowed outside range.	R/W	**0: Disabled** 1: Enabled		
A.8	[F-01]	--		**20°C**		
A.8	[F-02]	Bottom plate heater ON temperature.	R/W	3~10°C, step: 1°C **3°C**		
A.8	[F-03]	Bottom plate heater hysteresis.	R/W	2~5°C, step: 1°C **5°C**		
A.8	[F-04]	What is the configuration of electric heaters?	R/W	**0: No** 1: BPH only 2: BPH+DTH Type1 3: BPH+DTH Type2 4: BPH+DTH Type3		
A.8	[F-05]	--		**0**		
A.8	[F-09]	--		**0**		
A.8	[F-0A]	--		**0**		
A.8	[F-0B]	--		**0**		
A.8	[F-0D]	What is the pump operation mode?	R/W	0: Continuous 1: Sample **2: Request**		

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