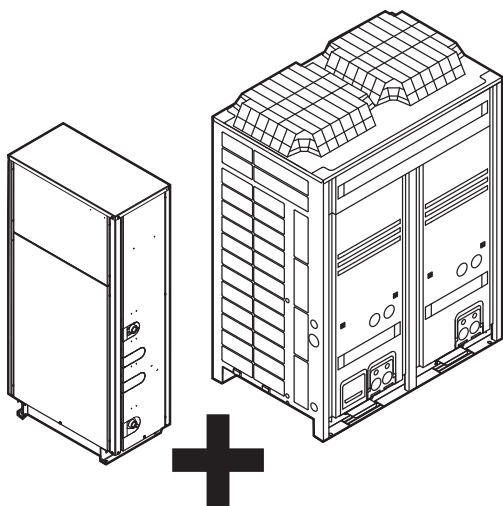


**DAIKIN**

# Installation and operation manual

## Split packaged air-cooled water chiller



**SERHQ020BAW1**  
**SERHQ032BAW1**

**SEHVX20BAW**  
**SEHVX32BAW**  
**SEHVX40BAW**  
**SEHVX64BAW**

Installation and operation manual  
Split packaged air-cooled water chiller

English









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# 1 About the documentation

## 1.1 About this document

### **i** INFORMATION

Make sure that the user has the printed documentation and ask him/her to keep it for future reference.

#### Target audience

Authorised installers + end users

### **i** INFORMATION

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

#### 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)
- **Installation and operation manual:**
  - Installation and operation instructions
  - Format: Paper (in the box of the indoor unit)
- **Installer and user reference guide:**
  - Preparation of the installation, reference data,...
  - 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/>

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

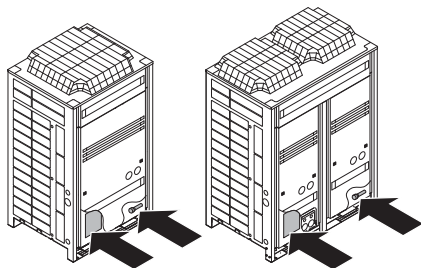
- A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible).
- The **full set** of latest technical data is available on the Daikin extranet (authentication required).

## For the installer

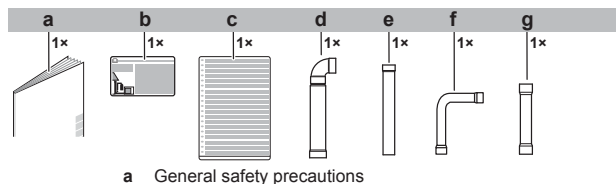
## 2 About the box

### 2.1 Outdoor unit

#### 2.1.1 To remove the accessories from the outdoor unit



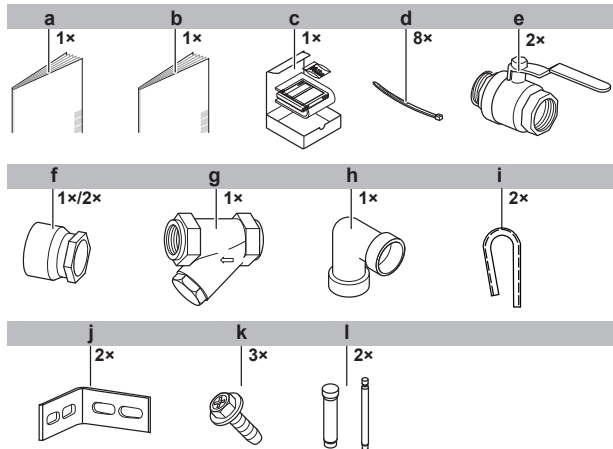
Make sure that all accessories are available in the unit.



- b Fluorinated greenhouse gases label
- c Multilingual fluorinated greenhouse gases label
- d Gas side accessory pipe
- e Gas side accessory pipe
- f Liquid side accessory pipe
- g Liquid side accessory pipes

## 2.2 Indoor unit

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



- a General safety precautions
- b Installation manual and operation manual (panel 3)
- c User interface (panel 3)
- d Tie wraps (panel 3)
- e Shut-off valves (panel 3)
- f Threaded connection (panel 3) (1x for SEHVX20+32BAW, 2x for SEHVX40+64BAW)
- g Filter (panel 3)
- h Elbow (panel 3)
- i Black grommet (2x)
- j L-shaped support (2x)
- k M5 screws (3x)
- l Accessory pipes (Ø12.7→Ø9.52 and Ø25.4→Ø28.6)

## 3 About the units and options

### 3.1 Identification



#### NOTICE

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

#### 3.1.1 About the outdoor unit

SERHQ outdoor units are designed for outdoor installation and are meant to be combined with SEHVX indoor units.

The outdoor units are designed to work in heating mode at ambient temperatures from  $-20^{\circ}\text{C}$  WB to  $15.5^{\circ}\text{C}$  WB and in cooling mode at ambient temperatures from  $-5^{\circ}\text{C}$  DB to  $43^{\circ}\text{C}$  DB.

#### 3.1.2 About the indoor unit

The SEHVX indoor units are intended for indoor installation and can be used for air conditioning purposes or for supplying water for process cooling applications.

The units are available in 4 standard sizes with nominal capacities ranging from 21.2 to 63.3 kW.

The unit is designed to work in heating mode at ambient temperatures from  $-15^{\circ}\text{C}$  to  $35^{\circ}\text{C}$  and in cooling mode at ambient temperatures from  $-5^{\circ}\text{C}$  to  $43^{\circ}\text{C}$ .

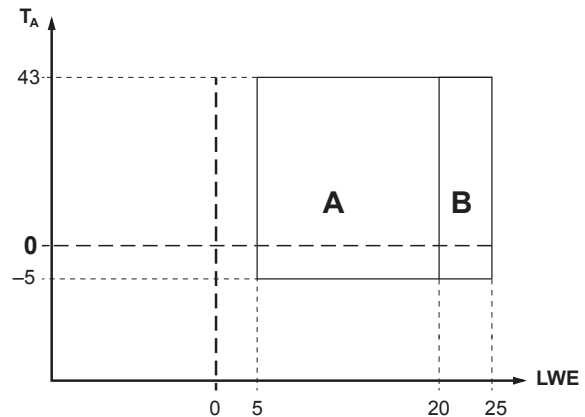
The main component is the water heat exchanger.

The indoor unit is connected to the outdoor unit by field refrigerant piping and the compressor in the outdoor unit circulates refrigerant into the heat exchangers.

- In cooling mode, the refrigerant transports the heat taken from the water heat exchanger to the air heat exchanger where the heat is released to the air.
- In heating mode, the refrigerant transports the heat taken from the air heat exchanger to the water heat exchanger where the heat is released to the water.

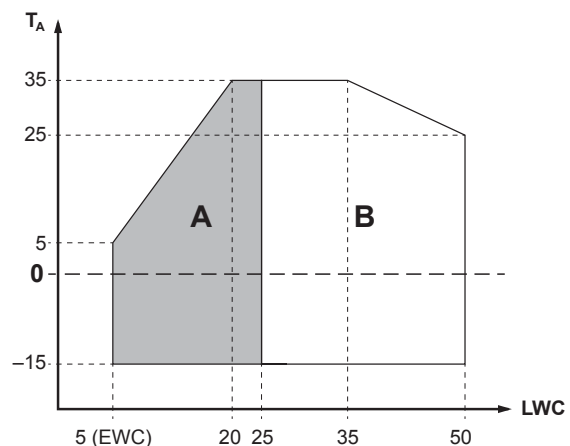
### 3.1.3 Operation range

#### Cooling



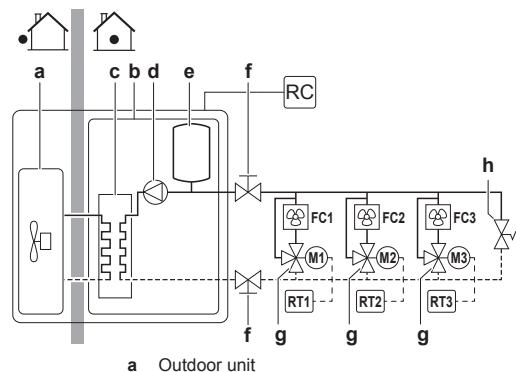
- $T_A$  Ambient temperature ( $^{\circ}\text{C}$  DB)
- LWE Leaving water evaporator temperature ( $^{\circ}\text{C}$ )
- A Standard water operation range
- B Pull down area

#### Heating



- $T_A$  Ambient temperature ( $^{\circ}\text{C}$  DB)
- LWC Leaving water condenser temperature ( $^{\circ}\text{C}$ )
- EWC Entering water condenser temperature ( $^{\circ}\text{C}$ )
- A Pull up area
- B Standard water operation range

## 3.2 System layout



a Outdoor unit

## 4 Preparation

|         |                             |
|---------|-----------------------------|
| b       | Indoor unit                 |
| c       | Plate heat exchanger        |
| d       | Pump                        |
| e       | Expansion vessel            |
| f       | Shut-off valve              |
| g       | Motorized valve             |
| h       | Bypass valve                |
| FC1...3 | Fancoil unit (field supply) |
| RC      | User interface              |
| RT1...3 | Room thermostat             |

## 4 Preparation

### 4.1 Preparing the installation site

#### 4.1.1 Installation site requirements of the outdoor unit



#### INFORMATION

Also read the following requirements:

- General installation site requirements. See the "General safety precautions" chapter.
- Service space requirements. See the "Technical data" chapter.
- Refrigerant piping requirements (length, height difference). See further in this "Preparation" chapter.

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the unit's weight and vibration.
- Make sure the unit is level.
- Select a place where rain can be avoided as much as possible.
- Take care that in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- Select the location of the unit in such a way that the sound generated by the unit does not disturb anyone, and the location is selected according to the applicable legislation.
- During installation, avoid the possibility that anybody can climb on the unit or place objects on the unit.
- All piping lengths and distances have been taken into consideration (see "4.2.3 About the piping length" on page 10).

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 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.



#### NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.



#### CAUTION

Appliance NOT accessible to the general public, install it in a secured area, protected from easy access.

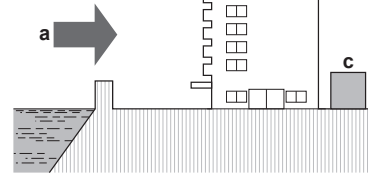
This unit is suitable for installation in a commercial and light industrial environment.

- When installing, take strong winds, typhoons or earthquakes into account, improper installation may result in the unit turning over.
- Be sure that the air inlet and outlet of the unit is not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a screen to block the wind.
- Ensure that water cannot cause any damage to the location by adding water drains to the foundation and prevent water traps in the construction.
- In heavy snowfall areas, select an installation site where snow will not affect the operation of the unit.

**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.

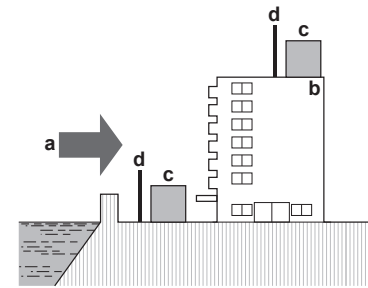
Install the outdoor unit away from direct sea winds.

**Example:** Behind the building.



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

- Height of windbreaker  $\geq 1.5 \times$  height of outdoor unit
- Mind the service space requirements when installing the windbreaker.



- a Sea wind
- b Building
- c Outdoor unit
- d Windbreaker

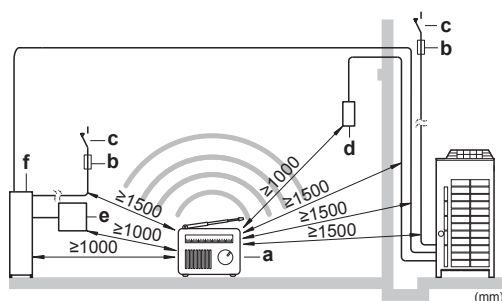


#### NOTICE

The equipment described in this manual may cause electronic noise generated from radio-frequency energy. The equipment complies to specifications that are designed to provide reasonable protection against such interference. However, there is no guarantee that interference will not occur in a particular installation.

It is therefore recommended to install the equipment and electric wires keeping proper distances away from stereo equipment, personal computers, etc.





- a Personal computer or radio
- b Fuse
- c Earth leakage breaker
- d Cool/heat selector
- e User interface
- f Indoor unit

In places with weak reception, keep distances of 3 m or more to avoid electromagnetic disturbance of other equipment and use conduit tubes for power and transmission lines.

### 4.1.2 Installation site requirements of the indoor unit

#### **i** INFORMATION

Also read the following requirements:

- General installation site requirements. See the "General safety precautions" chapter.
  - Service space requirements. See the "Technical data" chapter.
  - Refrigerant piping requirements (length, height difference). See further in this "Preparation" chapter.
- Provide sufficient space around the unit for servicing and air circulation.
  - Make sure the installation site withstands the unit's weight and vibration.
  - Make sure the unit is level.
  - Select the location of the unit in such a way that the sound generated by the unit does not disturb anyone, and the location is selected according the applicable legislation.
  - Take care that in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
  - During installation, avoid the possibility that anybody can climb on the unit or place objects on the unit.
  - All piping lengths and distances have been taken into consideration (see "4.2.3 About the piping length" on page 10).

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 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.

#### **!** NOTICE

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

#### **!** CAUTION

Appliance NOT accessible to the general public, install it in a secured area, protected from easy access.

This unit is suitable for installation in a commercial and light industrial environment.

## 4.2 Preparing refrigerant piping

### 4.2.1 Refrigerant piping requirements

#### **!** NOTICE

The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight.

- Clean and dry: foreign materials (including mineral oils or moisture) should be prevented from getting mixed into the system.
- Tight: R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce earth's protection against harmful ultraviolet radiation. R410A can contribute slightly to the greenhouse effect if it is released. Therefore pay special attention to check the tightness of the installation.

#### **!** NOTICE

The piping and other pressure-containing parts shall be suitable for refrigerant. Use phosphoric acid deoxidised seamless copper for refrigerant.

- Foreign materials inside pipes (including oils for fabrication) must be  $\leq 30$  mg/10 m.
- Temper grade: use piping with temper grade in function of the pipe diameter as listed in table below.

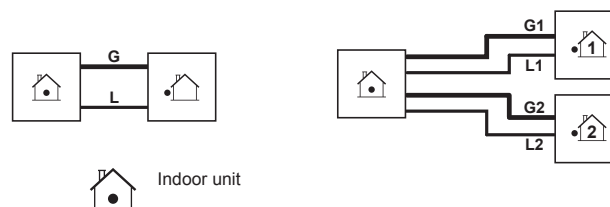
| Pipe $\varnothing$ | Temper grade of piping material |
|--------------------|---------------------------------|
| $\leq 15.9$ mm     | O (annealed)                    |
| $\geq 19.1$ mm     | 1/2H (half hard)                |

- The pipe thickness of the refrigerant piping shall comply with the applicable legislation. The minimal pipe thickness for R410A piping must be in accordance with the table below.

| Pipe $\varnothing$    | Minimal thickness t |
|-----------------------|---------------------|
| 6.4 mm/9.5 mm/12.7 mm | 0.80 mm             |
| 15.9 mm               | 0.99 mm             |
| 19.1 mm/22.2 mm       | 0.80 mm             |
| 28.6 mm               | 0.99 mm             |
| 34.9 mm               | 1.21 mm             |
| 41.3 mm               | 1.43 mm             |

### 4.2.2 To select the piping size

Determine the proper size using the following tables and reference figure (only for indication).



## 4 Preparation



Outdoor unit

- Piping connection sizes

| Indoor unit | Gas      | Liquid   | Outdoor unit    | Gas      | Liquid   |
|-------------|----------|----------|-----------------|----------|----------|
| SEHVX20BAW  | Ø25.4 mm | Ø12.7 mm | 1× SERHQ020BAW1 | Ø22.2 mm | Ø9.52 mm |
| SEHVX32BAW  | Ø25.4 mm | Ø12.7 mm | 1× SERHQ032BAW1 | Ø28.6 mm | Ø12.7 mm |
| SEHVX40BAW  | Ø25.4 mm | Ø12.7 mm | 2× SERHQ020BAW1 | Ø22.2 mm | Ø9.52 mm |
| SEHVX64BAW  | Ø25.4 mm | Ø12.7 mm | 2× SERHQ032BAW1 | Ø28.6 mm | Ø12.7 mm |

- Field piping sizes

| Indoor unit | G/G1     | L/L1     | G2       | L2       |
|-------------|----------|----------|----------|----------|
| SEHVX20BAW  | Ø28.6 mm | Ø9.52 mm | —        | —        |
| SEHVX32BAW  | Ø28.6 mm | Ø12.7 mm | —        | —        |
| SEHVX40BAW  | Ø28.6 mm | Ø9.52 mm | Ø28.6 mm | Ø9.52 mm |
| SEHVX64BAW  | Ø28.6 mm | Ø12.7 mm | Ø28.6 mm | Ø12.7 mm |

If the indoor unit connections do not match the diameter of the specified piping requirements, the piping diameter requirements must be met using reducers/expanders (field supply) on the indoor unit connections.

Other diameters (mm sizes) can also be used if the required pipe sizes (inch sizes) are not available, taking the following into account:

- select the pipe size nearest to the required size,
- use the suitable adapters for the change-over from inch to mm pipes (field supply).

### 4.2.3 About the piping length

| Maximum piping length and height difference                                 |       |
|---|-------|
| Maximum allowable piping length   | 30 m  |
| Height difference between indoor and outdoor unit                           | <10 m |
| Height difference between outdoor unit 1 and outdoor unit 2 (if applicable) | 0 m   |

## 4.3 Preparing water piping

### 4.3.1 To check the water volume and expansion vessel pre-pressure

The unit has an expansion vessel of 12 litre with a default pre-pressure of 1 bar.

To make sure that the unit operates properly:

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

#### Minimum water volume

| Model | Minimum total water volume (l) |
|-------|--------------------------------|
| 20    | 76                             |
| 32    | 110                            |
| 40    | 152                            |
| 64    | 220                            |



#### INFORMATION

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



#### INFORMATION

The temperature step difference can be modified using settings [A-02] and [F-00]. This has an impact on the minimum water volume required when the unit operates in cooling.

By default, the unit is set to have a water temperature difference of 3.5 K which allows it to operate with the minimum volume mentioned in the previous table. However, if a smaller temperature differential is set, as in the case of process cooling applications where temperature fluctuations must be avoided, a larger minimum water volume will be required.

To ensure proper operation of the unit when changing the values of setting [F-00] (for cooling mode), the minimum water volume has to be corrected. If this volume exceeds the range allowed in the unit, an additional expansion vessel or a buffer tank must be installed in the field piping.

#### Example:

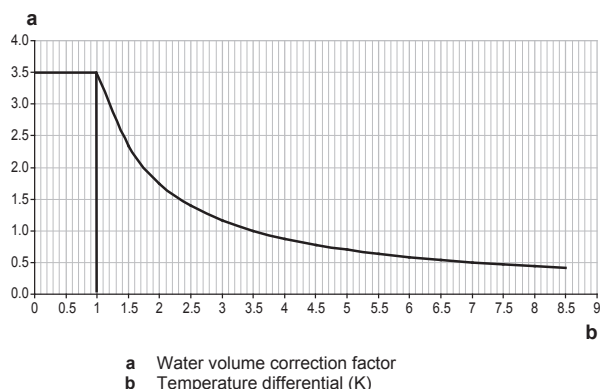
To illustrate the impact on the system when modifying the setting [F-00], we will consider a unit with a minimum allowable water volume of 66 l. The unit is installed 5 m below the highest point in the water circuit.

Assuming that the setting [F-00] is changed from 5°C (default value) to 0°C. From the below table we see that 5°C corresponds to a temperature differential of 3.5 K and 0°C to 1 K, which is actually the lowest value we can set.

| [F-00] value (°C) | Temperature differential (K) |
|-------------------|------------------------------|
| 0                 | 1                            |
| 1                 | 1.5                          |
| 2                 | 2                            |
| 3                 | 2.5                          |
| 4                 | 3                            |
| 5                 | 3.5                          |
| 6                 | 4                            |
| 7                 | 4.5                          |
| 8                 | 5                            |
| 9                 | 5.5                          |
| 10                | 6                            |
| 11                | 6.5                          |
| 12                | 7                            |
| 13                | 7.5                          |
| 14                | 8                            |
| 15                | 8.5                          |

The water volume correction factor according to the curve shown in the below graph is 3.5; this means that the minimum volume will be 3.5 times larger.

#### Correction factor curve for minimum water volume



When multiplying 64 l by the correction factor, we get 224 l, which will be the minimum water volume allowed in the installation if a temperature differential of 1 K is used.

Now it is very important to check that for the height difference of the system, the volume in the system is less than the maximum allowed value at that pre-pressure (Pg). If we take a look at the curve, for 1 bar of pre-pressure, the maximum volume allowed is 350 l.

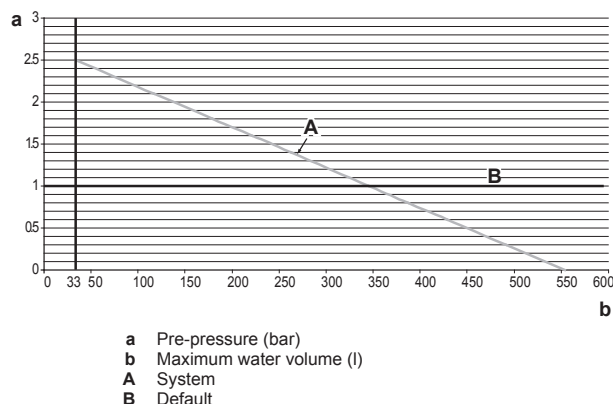
The total volume in the system will definitely be larger after adding the internal volume of the unit. In this case, some pre-pressure can be applied or an additional expansion vessel or buffer tank must be installed in the field piping.

The default value of pre-pressure (Pg) is for a height difference of 7 m.

If the height difference of the system is lower than 7 m AND the volume in the system is less than the maximum allowed value at that pre-pressure (Pg) (see graph), then NO pre-pressure (Pg) adjustment is required.

### Maximum water volume

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



If the total water volume in the entire circuit exceeds the maximum allowed water volume (see graph), an additional expansion vessel must be installed in the field piping.

## 4.4 Preparing electrical wiring

### 4.4.1 Safety device requirements

The power supply must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage protector in accordance with the applicable legislation.

Selection and sizing of the wiring should be done in accordance with the applicable legislation based on the information mentioned in the table below.

### INFORMATION

Multi units are standard combinations.

| Outdoor unit | Recommended fuses |
|--------------|-------------------|
| SERHQ020BAW1 | 32 A              |
| SERHQ032BAW1 | 40 A              |

| Indoor unit | Recommended fuses |
|-------------|-------------------|
| SEHVX20BAW  | 6 A               |
| SEHVX32BAW  | 10 A              |
| SEHVX40BAW  |                   |
| SEHVX64BAW  |                   |

### NOTICE

When using residual current operated circuit breakers, be sure to use a high-speed type 300 mA rated residual operating current.

## 5 Installation

### 5.1 Opening the units

#### 5.1.1 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.

#### 5.1.2 To open the outdoor unit

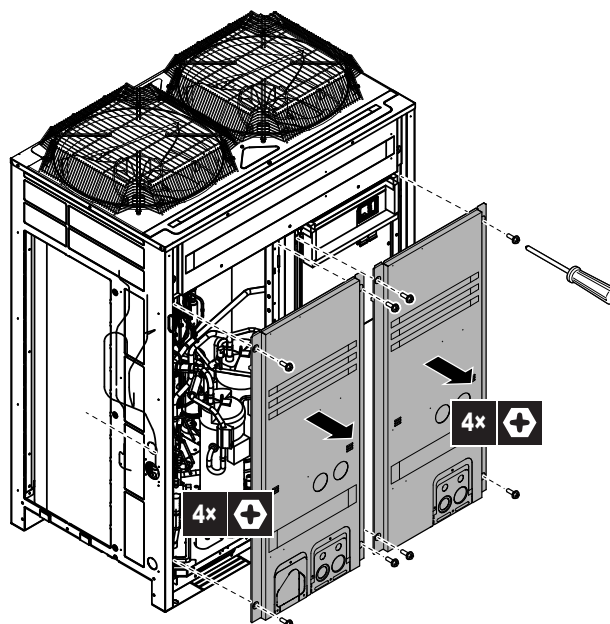


**DANGER: RISK OF ELECTROCUTION**



**DANGER: RISK OF BURNING**

To gain access to the unit, front plates need to be opened as follows:



## 5 Installation

Once the front plates open, the electrical component box can be accessed. See "5.1.4 To open the electrical component box of the outdoor unit" on page 12.

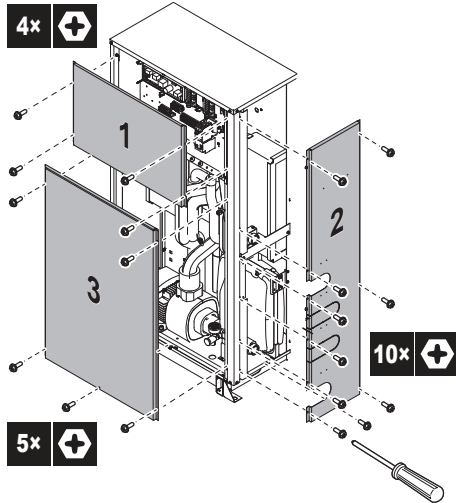
For service purposes, the pushbuttons on the main PCB need to be accessed. To access these pushbuttons, the electrical component box cover does not need to be opened. See "6.1.3 To access the field setting components" on page 27.

### 5.1.3 To open the indoor unit

 **DANGER: RISK OF ELECTROCUTION**

 **DANGER: RISK OF BURNING**


To gain access to the unit, front plates need to be opened as follows:

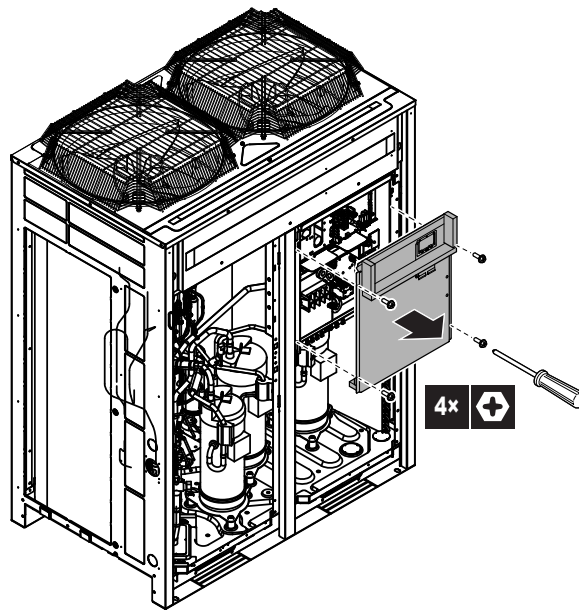


| Panel |                                     |
|-------|-------------------------------------|
| 1     | Electrical parts of the indoor unit |
| 2     | Indoor unit (side panel)            |
| 3     | Indoor unit (front panel)           |


Once the front plates open, the electrical component box can be accessed. See "5.1.5 To open the electrical component box of the indoor unit" on page 12.

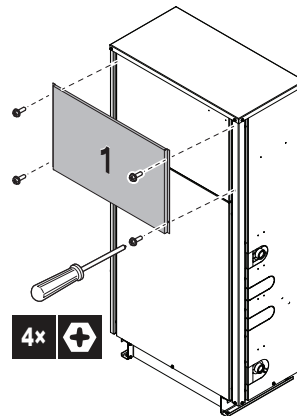
### 5.1.4 To open the electrical component box of the outdoor unit

 **NOTICE**  
Do NOT apply excessive force when opening the electronic component box cover. Excessive force can deform the cover, resulting in entering of water to cause equipment failure.



### 5.1.5 To open the electrical component box of the indoor unit


 **NOTICE**  
Do NOT apply excessive force when opening the electronic component box cover. Excessive force can deform the cover, resulting in entering of water to cause equipment failure.



## 5.2 Mounting the outdoor unit

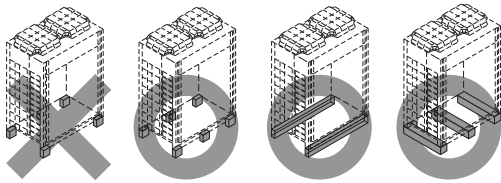
### 5.2.1 To provide the installation structure

Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.

 **NOTICE**

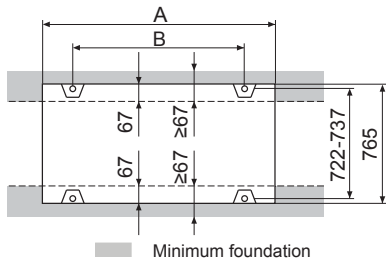
- When the installation height of the unit needs to be increased, do NOT use stands to only support the corners.
- Stands under the unit must be at least 100 mm wide.





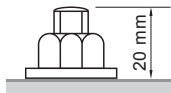
X Not allowed  
O Allowed

- The height of the foundation must at least be 150 mm from the floor. In heavy snowfall areas, this height should be increased, depending on the installation place and condition.
- The preferred installation is on a solid longitudinal foundation (steel beam frame or concrete).



| Outdoor unit | A    | B    |
|--------------|------|------|
| SERHQ020     | 930  | 792  |
| SERHQ032     | 1240 | 1102 |

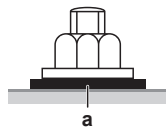
- Fasten the unit in place using four foundation bolts M12. It is best to screw in the foundation bolts until their length remains 20 mm above the foundation surface.



## 5.2.2 To provide drainage

### NOTICE

- Prepare a water drainage channel around the foundation to drain waste water from around the unit.
- If the unit is to be installed on a roof, check the strength of the roof and its drainage facilities first.
- If the unit is to be installed on a frame, install the waterproofing board within a distance of 150 mm under the unit in order to prevent infiltration of water coming from under the unit.
- When installed in a corrosive environment, use a nut with plastic washer (a) to protect the nut tightening part from rust.



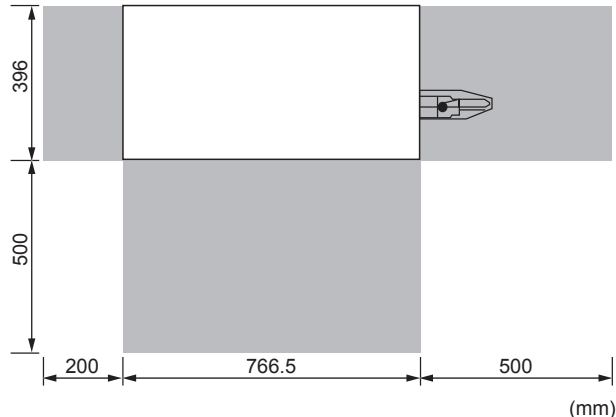
## 5.3 Mounting the indoor unit

### 5.3.1 To provide the installation structure

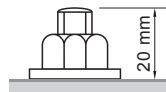
Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise.

### NOTICE

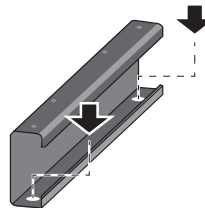
- When the installation height of the unit needs to be increased, do NOT use stands to only support the corners.
- Stands under the unit must be at least 100 mm wide.
- The unit must be mounted against the wall.
- The unit must be fixed to prevent it from tilting.
- The preferred installation is on a solid longitudinal foundation (steel beam frame or concrete).
- Observe the minimum installation space requirements.



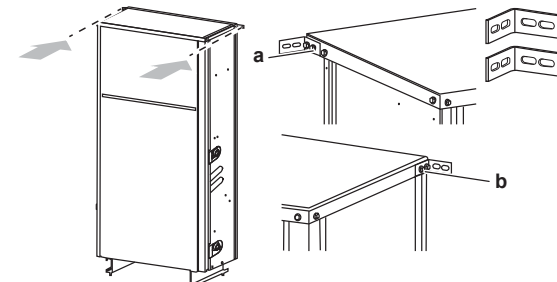
- Fasten the unit in place using four foundation bolts M12. It is best to screw in the foundation bolts until their length remains 20 mm above the foundation surface.



- Fasten the unit to the floor using the holes in the bottom beams.



- Fasten the unit to the wall using the 2 accessory L-shaped supports to prevent it from falling over. The supports can be fixed to the top panel of the indoor unit (2× M5 screws on either side, but one screw is already mounted on the right side of the top plate).



- Attach one L-shaped support to the left side of the top plate using 2 screws from the accessory bag
- Attach the other L-shaped support to the right side of the top plate using 1 screw from the accessory bag and 1 screw that is already attached to the unit

## 5 Installation

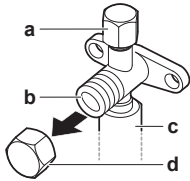
### 5.4 Connecting the refrigerant piping

#### 5.4.1 Using the stop valve and service port

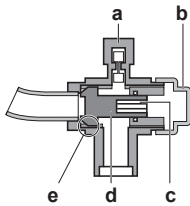
##### To handle the stop valve

Take the following guidelines into account:

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



- a Service port and service port cover
- b Stop valve
- c Field piping connection
- d Stop valve cover

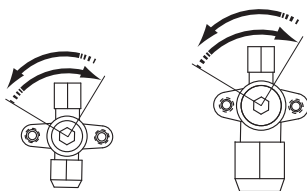


- a Service port
- b Stop valve cover
- c Hexagon hole
- d Shaft
- e Seal

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

##### To open/close the stop valve

- 1 Remove the stop valve cover.
- 2 Insert a hexagon wrench (liquid side: 4 mm, gas side: 8 mm) into the stop valve and turn the stop valve:



Counterclockwise to open.  
Clockwise to close.

- 3 When the stop valve CANNOT be turned any further, stop turning. The valve is now open/closed.

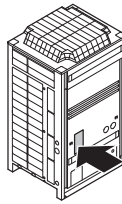
##### **i** INFORMATION

- The SERHQ020 supports  $\varnothing 22.2$  field piping on the accessory pipe supplied with the unit.
- The SERHQ032 supports  $\varnothing 28.6$  field piping on the accessory pipe supplied with the unit.

##### To handle the service port

###### Location of service ports:

For the service port location, refer to the "Caution" label attached on the front panel of the outdoor unit.



- Always use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, make sure to tighten the service port cover securely. For the tightening torque, refer to the table below.
- Check for refrigerant leaks after tightening the service port cover.

##### Tightening torques

| Stop valve size (mm) | Tightening torque N•m (turn clockwise to close) |                  |                 |              |
|----------------------|---|------------------|-----------------|--------------|
|                      | Shaft   |                  |                 |              |
|                      | Valve body                                      | Hexagonal wrench | Cap (valve lid) | Service port |
| $\varnothing 9.5$    | 5.4~6.6   | 4 mm             | 13.5~16.5       | 11.5~13.9    |
| $\varnothing 12.7$   | 8.1~9.9   |                  | 18.0~22.0       |              |
| $\varnothing 25.4$   | 27.0~33.0                                       | 8 mm             | 22.5~27.5       |              |

#### 5.4.2 To connect the refrigerant piping to the outdoor unit

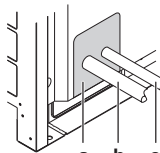


##### NOTICE

All field piping must be installed by a licensed refrigeration technician and must comply with the relevant local and national regulations.

Seal the piping and wiring intake holes using sealing material (field supply), otherwise the capacity of the unit will drop and small animals may enter the machine.

Example: passing piping out through the front



- a Plug the grey areas (piping routed through the front panel)
- b Gas side piping
- c Liquid side piping



##### NOTICE

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



##### NOTICE

- Be sure to use the supplied accessory pipes when carrying out piping work in the field.
- Be sure that the field installed piping does not touch other pipes, the bottom panel or side panel. Especially for the bottom and side connection, be sure to protect the piping with suitable insulation, to prevent it from coming into contact with the casing.



##### NOTICE

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



**WARNING**

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

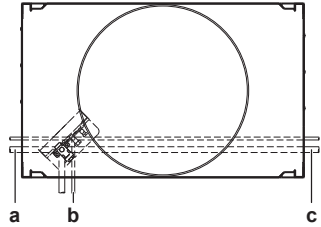
- Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.
- Toxic gas may be produced if refrigerant gas comes into contact with fire.



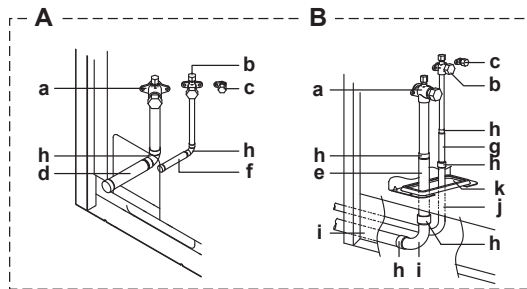
**WARNING**

NEVER directly touch any accidental leaking refrigerant. This could result in severe wounds caused by frostbite.

The refrigerant piping can be installed from the front or from the side of the unit (when taken out from the bottom) as shown in the figure.



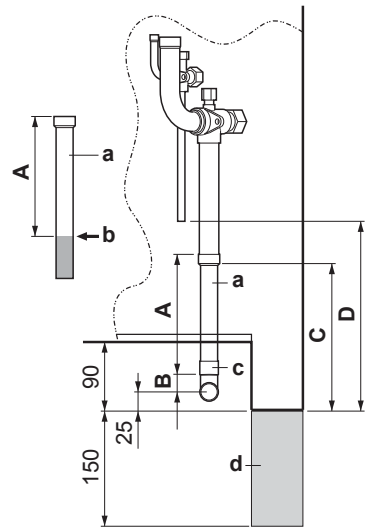
- a Left-side connection
- b Front connection
- c Right-side connection



- A For front connection, remove the stop valve cover to connect the refrigerant piping.
- B For side connection, remove the knockouts in the bottom frame and route the piping under the bottom frame.
- a Gas pipe stop valve
- b Liquid pipe stop valve
- c Service port for adding refrigerant
- d Gas side accessory pipe (1)
- e Gas side accessory pipe (2)
- f Liquid side accessory pipe (1)
- g Liquid side accessory pipe (2)
- h Brazing
- i Gas side piping (field supply)
- j Liquid side piping (field supply)
- k Open the knockout holes with a hammer

**Cutting the gas side accessory pipe**

When connecting the refrigerant piping from the side, cut the gas side accessory pipe as shown in the figure.



- a Gas side accessory pipe
- b Cut here
- c Gas side piping (field supply)
- d Unit base

| Outdoor unit | A   | B  | C   | D   |
|--------------|-----|----|-----|-----|
| SERHQ020     | 156 | 23 | 192 | 247 |
| SERHQ032     | 150 | 29 | 192 | 251 |



**NOTICE**

- When connecting the piping on site, be sure to use the accessory piping.
- Make sure the onsite piping does not come into contact with other piping, the bottom frame or side panels of the unit.



**NOTICE**

Precautions when making knockout holes:

- Avoid damaging the casing.
- After making the knockout holes, we recommend you remove the burrs and paint the edges and areas around the edges using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, wrap the wiring with protective tape to prevent damage.



**WARNING**



Never remove the pinched piping by brazing.



**WARNING**

Any gas or oil remaining inside the stop valve may blow off the pinched piping.

Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Use the following procedure to remove the pinched piping:

- 1 Remove the valve lid and make sure that the stop valves are fully closed.

## 5 Installation



- 2 Connect a charge hose to service ports of all stop valves.
- 3 Recover gas and oil from the pinched piping by using a recovery unit.



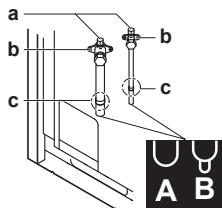
### CAUTION

Do not vent gases into the atmosphere.

- 4 When all gas and oil is recovered from the pinched piping, disconnect the charge hose and close the service ports.
- 5 If the pinched piping lower part looks like detail A in the figure below, perform the last 2 steps of this procedure.
- 6 If the pinched piping lower part looks like detail B in the figure below, perform the last 3 steps of this procedure.
- 7 Cut off the lower part of the smaller pinched piping with an appropriate tool (e.g. a pipe cutter, a pair of nippers, ...) so that a cross-section is open, allowing remaining oil to drip out in case the recovery was not complete. Wait until all oil has dripped out.



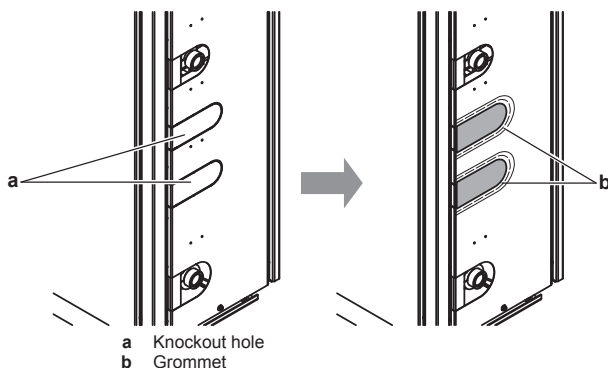
- 8 Cut the pinched piping off with a pipe cutter just above the brazing point or just above the marking if there is no brazing point.
- 9 Wait until all oil is dripped out in case the recovery was not complete, and only then proceed with connection of the field piping.



- a Service port  
 b Stop valve  
 c Point of pipe cutting just above brazing point or above marking  
 A+B Pinched piping

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

- For the SEHVX20+32BAW, remove the top knockout hole in the side service plate and add the grommet (accessory) to cover any burrs. For the SEHVX40+64BAW, remove both top and bottom knockout holes in the side service plate and add the grommets (accessory) to cover any burrs.



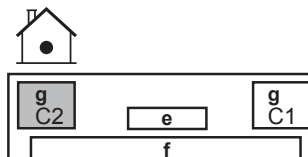
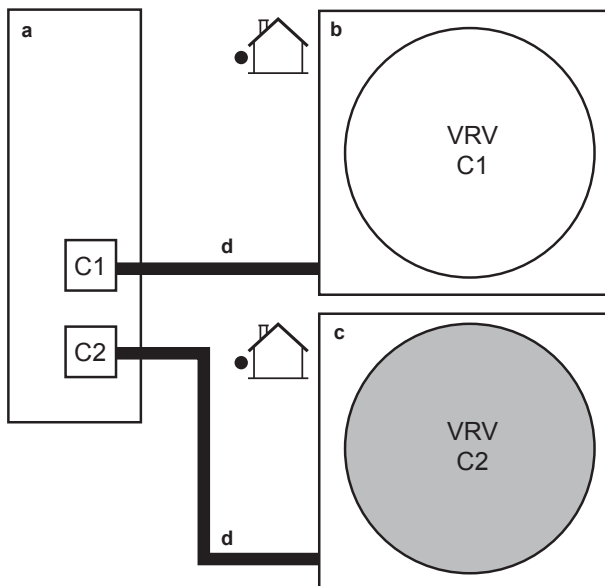
- a Knockout hole  
 b Grommet

- First cut off the refrigerant liquid piping inside the unit approximately 7 cm before the clamp and the refrigerant gas piping 4 cm before the clamp. This is necessary in order to avoid the piping cutter tool from interfering with the piping. Remove any burrs from the piping.
- Use accessory pipes to connect field refrigerant piping to the piping connections on the indoor unit. For SEHVX20BAW, after cutting off the end of both the liquid and gas refrigerant piping, braze accessory pipe 1 to the liquid connection and accessory pipe 2 to the gas connection. For SEHVX32BAW, after cutting off the end of both the liquid and gas refrigerant piping, braze the field piping directly to the liquid connection and accessory pipe 2 to the gas connection. For SEHVX40BAW, perform the procedure for SEHVX20BAW twice. For SEHVX64BAW, perform the procedure for SEHVX32BAW twice.



### NOTICE

After brazing, fix the pipes to the unit using the clamps in the pipe supports.



- a Indoor unit  
 b Outdoor unit 1  
 c Outdoor unit 2 (only in case of SEHVX40+64BAW)  
 d Refrigerant piping  
 e Pump  
 f Switchbox  
 g Evaporator



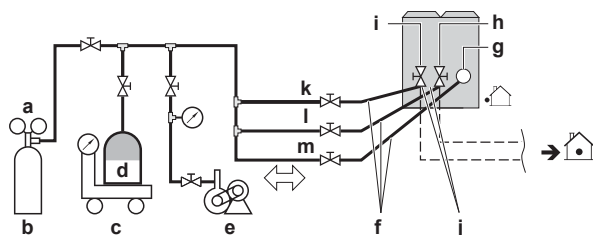
### NOTICE

When installing the piping between the outdoor and indoor units, also refer to the figure in "5.8.4 To connect the power supply and transmission cables" on page 25.



## 5.5 Checking the refrigerant piping

### 5.5.1 Checking refrigerant piping: Setup



- a Pressure reducing valve
- b Nitrogen
- c Weighing scales
- d R410A refrigerant tank (siphon system)
- e Vacuum pump
- f Charge hose
- g Service port for adding refrigerant
- h Liquid line stop valve
- i Gas line stop valve
- j Stop valve service port
- k Valve A
- l Valve B
- m Valve C

| Valve                  | State of valve |
|------------------------|----------------|
| Valve A                | Close          |
| Valve B                | Open           |
| Valve C                | Open           |
| Liquid line stop valve | Close          |
| Gas line stop valve    | Close          |

### 5.5.2 To check for leaks: Pressure leak test

#### NOTICE

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

- 1 Break the vacuum by pressurising with nitrogen gas to a gauge pressure of 4.0 MPa (40 bar). Never set the gauge pressure higher than the maximum operation pressure of the unit, i.e. 4.0 MPa (40 bar).

### 5.5.3 To perform vacuum drying

To remove all moisture from the system, proceed as follows:

- 1 Evacuate the system for at least 2 hours to a target vacuum of  $-100.7 \text{ kPa}$  ( $-1.007 \text{ bar}$ ) ( $5 \text{ Torr absolute}$ ).
- 2 Check that, with the vacuum pump turned off, the target vacuum is maintained for at least 1 hour.
- 3 Should you fail to reach the target vacuum within 2 hours or maintain the vacuum for 1 hour, the system may contain too much moisture. In that case, break the vacuum by pressurising with nitrogen gas to a gauge pressure of  $0.05 \text{ MPa}$  ( $0.5 \text{ bar}$ ) and repeat steps 1 to 3 until all moisture has been removed.

#### NOTICE

In case of an SERHQ032, perform the operations on both units.

### 5.5.4 To insulate the refrigerant piping

After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

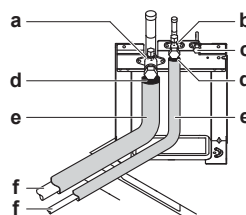
- Be sure to insulate the liquid and gas piping (for all units).
- Use heat resistant polyethylene foam which can withstand a temperature of  $70^\circ\text{C}$  for liquid piping and polyethylene foam which can withstand a temperature of  $120^\circ\text{C}$  for gas piping.

- Reinforce the insulation on the refrigerant piping according to the installation environment.

| Ambient temperature     | Humidity       | Minimum thickness |
|-------------------------|----------------|-------------------|
| $\leq 30^\circ\text{C}$ | 75% to 80% RH  | 15 mm             |
| $> 30^\circ\text{C}$    | $\geq 80\%$ RH | 20 mm             |

Condensation might form on the surface of the insulation.

- If there is a possibility that condensation on the stop valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, this must be prevented by sealing up the connections. See below figure.



- a Gas line stop valve
- b Liquid line stop valve
- c Service port for adding refrigerant
- d Sealing up treatment
- e Insulation
- f Piping between indoor and outdoor unit



#### DANGER: RISK OF BURNING

Be sure to insulate local pipes, as touching them can cause burns.

## 5.6 Charging refrigerant

### 5.6.1 About charging refrigerant

Once vacuum drying is finished, additional refrigerant charging can start.

There are two methods to charge additional refrigerant.

| Method           | See   |
|------------------|---|
| Automatic charge | <a href="#">"Step 6a: To automatically charge refrigerant" on page 18</a> |
| Manual charge    | <a href="#">"Step 6b: To manually charge refrigerant" on page 20</a>      |

To speed up the refrigerant charging process, it is in case of larger systems recommended to first pre-charge a portion of refrigerant through the liquid line before proceeding with the actual automatic or manual charging. This step is included in below procedure (see ["5.6.4 To charge refrigerant" on page 18](#)). It can be skipped, but charging will take longer then.

### 5.6.2 Precautions when charging refrigerant



#### INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

## 5 Installation



### WARNING

- Only use R410A as refrigerant. Other substances may cause explosions and accidents.
- R410A contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 2087.5. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, always use protective gloves and safety glasses.



### NOTICE

If the power of some units is turned off, the charging procedure cannot be finished properly.



### NOTICE

Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.



### NOTICE

If operation is performed within 12 minutes after the indoor and outdoor units are turned on, the H2P LED will be lit and the compressor will not operate before communication is established between outdoor unit(s) and indoor units.



### NOTICE

Close the front panel before any refrigerant charge operation is executed. Without the front panel attached the unit cannot judge correctly whether it is operating properly or not.



### NOTICE

In case of maintenance and the system (outdoor unit+field piping+indoor units) does not contain any refrigerant any more (e.g., after refrigerant reclaim operation), the unit has to be charged with its original amount of refrigerant (refer to the nameplate on the unit) by pre-charging before the automatic charging function can be started.



### NOTICE

- The refrigerant charging port is connected to the piping inside the unit. The unit's internal piping is already factory charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, do not forget to close the lid of the refrigerant charging port. The tightening torque for the lid is 11.5 to 13.9 N·m.
- In order to ensure uniform refrigerant distribution, it may take the compressor ±10 minutes to start up after the unit has started operation. This is not a malfunction.

### 5.6.3 To determine the additional refrigerant amount



#### INFORMATION

For final charge adjustment in a test laboratory, contact your dealer.

The additional refrigerant charge calculation is based on the liquid piping size.

#### Formula:

$$R=(X_{09.52} \times 0.059)+(X_{012.7} \times 0.12)$$

R Additional refrigerant to be charged [in kg and rounded off to 1 decimal place]

X<sub>1,2</sub> Total length [m] of liquid piping size at Øa

#### Example

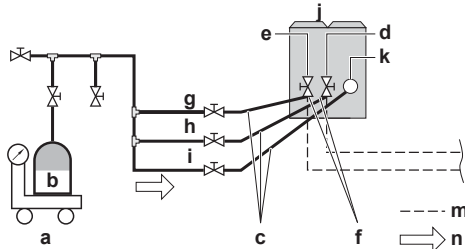
SEHVX64BAW + 2× SERHQ032BAW1

$$R=(L_1+L_2)_{012.7} \times 0.12$$

### 5.6.4 To charge refrigerant

#### Pre-charging refrigerant

- Calculate the additional amount of refrigerant to be added using the formula mentioned in "5.6.3 To determine the additional refrigerant amount" on page 18.
- The amount to be pre-charged is 10 kg less than the calculated amount.
- Open valve C (valves A and B and the stop valves must be left closed) and charge the refrigerant in liquid form via the liquid side stop valve service port.
- Close valve C when the calculated amount for pre-charging is reached.



- a Weighing scales
- b Refrigerant R410A tank (siphon system)
- c Charge hose
- d Liquid line stop valve
- e Gas line stop valve
- f Stop valve service port
- g Valve B
- h Valve C
- i Valve A
- j Refrigerant charge port
- k Interunit piping
- l Refrigerant piping
- m Field piping
- n Gas flow



### NOTICE

In case of maintenance and the system (outdoor unit+field piping+indoor units) does not contain any refrigerant any more (e.g., after refrigerant reclaim operation), the unit has to be charged with its original amount of refrigerant (refer to the nameplate on the unit) by pre-charging before the automatic charging function can be started.



#### INFORMATION

The refrigerant will be charged with ±22 kg in 1 hour time at an outdoor temperature of 30°C DB or with ±6 kg at an outdoor temperature of 0°C DB.

- After pre-charging, connect valve A to the refrigerant charge port and charge the remaining additional refrigerant through this port.

#### Step 6a: To automatically charge refrigerant



#### INFORMATION

The automatic refrigerant charging has limits as described below. Out of these limits, the system cannot operate the automatic refrigerant charging:

- Outdoor temperature: 0~43°C DB.
- Indoor temperature: 20~32°C DB.
- Total indoor unit capacity: ≥80%.

The remaining additional refrigerant charge can be charged by operating the outdoor unit by means of the automatic refrigerant charge operation mode.

Depending on the ambient limitation conditions (see above), the unit will automatically decide which operation mode will be used to fulfill the automatic refrigerant charge: cooling or heating. If above conditions are fulfilled, cooling operation will be selected. If not, heating.

### Procedure

- 1 Open the liquid and gas side stop valves and the service port stop valve. (Valves A, B and C must be closed.)
- 2 Close all front panels except the electrical component box front panel and turn the power ON.
- 3 If the H2P LED is flashing, check the malfunction code on the user interface. See ["5.6.5 Error codes when charging refrigerant" on page 20](#).
- 4 Push BS1 if the LED display is not as shown below.

● ● ☼ ● ● ● ●

- 5 Push BS4 once.

☼ ☼ ☼ ☼ ☼ ☼ ☼

- 6 Push BS4 for at least 5 seconds.
- 7 This step is the charging mode judgement. Automatic charging must be performed in cooling mode. However, if the indoor temperature is 20°C DB or lower, the unit will first charge in heating mode in order to increase the indoor temperature. The unit will automatically select the cooling mode or heating mode for charging.



### NOTICE

When charging in heating mode, valve A must be closed manually before complete charging is finished.

### Automatic refrigerant charging in heating mode

- 1 Start up the unit and wait while it is preparing for charging in heating mode.

Pressure control (first minute) ● ☼ ● ● ● ● ☼

Startup control (next 2 minutes) ☼ ☼ ● ● ● ☼ ●

Waiting for stable heating conditions (next ±15 minutes (depending on the system)) ☼ ☼ ● ● ● ☼ ☼

Ready for charging ☼ ☼ ● ● ☼ ● ☼

- 2 Press BS4 once within 5 minutes. If BS4 is not pushed within 5 minutes, P2 will be displayed on the user interface.

- 3 When the following LED display is shown, open valve A and close the front panel. If the front panel is left open, the system cannot operate properly during the refrigerant charging.

☼ ☼ \* \* \* \* \*

\* = The state of this LED is not important.



### NOTICE

When a malfunction occurs, check the user interface display and refer to ["5.6.5 Error codes when charging refrigerant" on page 20](#).

- 4 When the calculated amount of refrigerant minus 10 kg is reached, refrigerant charging is complete. Close valve A and press BS3 once. As long as BS3 is not pressed, the system will remain in heating mode. This may be required to increase the indoor temperature.

☼ ☼ ☼ ☼ ☼ ☼ ☼

- 5 Press BS4 to perform the temperature range check.

**Result:** If the temperature is outside the temperature range, press BS1 once and complete refrigerant charging at another time when the temperature is within range. If the temperature is within range, the unit will restart from step 7 in ["Step 6a: To automatically charge refrigerant" on page 18](#), and the cooling mode will be selected. However, if in the meantime the temperature has become out of range, the heating mode will be selected again in order to increase the indoor temperature.

Out of outdoor temperature range ☼ ☼ ☼ ☼ ☼ ● ●

Out of indoor temperature range ☼ ☼ ☼ ☼ ● ☼ ●

### Automatic refrigerant charging in cooling mode

- 1 Start up the unit and wait while it is preparing for charging in cooling mode.

Pressure control (first minute) ● ☼ ● ● ● ● ☼

Startup control (next 2 minutes) ● ☼ ● ● ● ☼ ●

Waiting for stable conditions (next ±15 minutes (depending on the system)) ● ☼ ● ● ● ☼ ☼

Ready for charging ☼ ☼ ☼ ● ☼ ● ☼

- 2 Press BS4 once within 5 minutes. If BS4 is not pushed within 5 minutes, P2 will be displayed on the user interface.

- 3 When the following LED display is shown, open valve A and close the front panel. If the front panel is left open, the system cannot operate properly during the refrigerant charging.

☼ ☼ \* \* \* \* \*

\* = The state of this LED is not important.



### NOTICE

When a malfunction occurs, check the user interface display and refer to ["5.6.5 Error codes when charging refrigerant" on page 20](#).

- 4 If the user interface display shows a flashing PE code, charging is almost finished. When the unit stops operating, close valve A immediately, check the LEDs, and check if P9 is displayed on the user interface. When the charging amount is little, the PE code may not be displayed, but instead P9 will be displayed immediately. If the LED display is not as shown below, correct the malfunction (as indicated on the user interface display) and restart the complete charging procedure.

☼ ☼ ☼ ☼ ☼ ☼ ☼

- 5 Press BS4 to perform the temperature range check.

**Result:** If the temperature is outside the temperature range, press BS1 once and complete refrigerant charging at another time when the temperatures are within range.

Out of outdoor temperature range ☼ ☼ ☼ ☼ ☼ ● ●

Out of indoor temperature range ☼ ☼ ☼ ☼ ● ☼ ●

Within range ☼ ☼ ☼ ☼ ☼ ☼ ☼

- 6 Press BS1 once to complete charging.
- 7 Record the amount that was added on the additional refrigerant charge label provided with the unit and attach it on the back side of the front panel.
- 8 Perform the test procedure described in ["7.5.1 Refrigerant added using automatic charging" on page 37](#).

Perform the test procedure as described in ["7 Commissioning" on page 35](#).

## 5 Installation

### Step 6b: To manually charge refrigerant

#### Manual refrigerant charging with the unit at a standstill

- 1 Calculate how much refrigerant is to be added using the formula explained in "5.6.3 To determine the additional refrigerant amount" on page 18.
- 2 Open valve C (valves A and B and the stop valves must be left closed) and charge the required amount of refrigerant through the liquid side stop valve service port.
- 3 When the required amount of refrigerant is fully charged, close valve C. Record the amount of refrigerant that was added on the additional refrigerant charge label provided with the unit and attach it on the back side of the front panel. Perform the test procedure as described in "7.5.3 Refrigerant added using manual charging (heating mode, pre-charging)" on page 37.
- 4 When the additional charging is not complete, perform the procedure below.

#### Manual refrigerant charging with the unit operating

- 1 Open the liquid and gas side stop valves and the service port stop valve. (Valves A, B and C must be closed.)
- 2 Close all front panels except the electrical component box front panel and turn the power ON.
- 3 If the H2P LED is flashing, check the malfunction code on the user interface. See "5.6.5 Error codes when charging refrigerant" on page 20.
- 4 Push BS1 if the LED display is not as shown below.

● ● ✨ ● ● ● ●

- 5 Push BS4 once.

✨ ✨ ✨ ✨ ✨ ✨ ✨

- 6 Push BS4 for at least 5 seconds. The unit will automatically select the cooling mode or heating mode for charging. However, if the indoor temperature is 20°C DB or lower, the unit will first charge in heating mode in order to increase the indoor temperature.

#### Manual refrigerant charging in heating mode

##### NOTICE

When charging in heating mode, valve A must be closed manually before complete charging is finished.

- 1 Start up the unit and wait while it is preparing for charging in heating mode.

Pressure control (first minute) ● ✨ ● ● ● ● ✨

Startup control (next 2 minutes) ✨ ✨ ● ● ● ✨ ●

Waiting for stable heating conditions (next ±15 minutes (depending on the system)) ✨ ✨ ● ● ● ✨ ✨

Ready for charging ✨ ✨ ● ● ✨ ● ✨

- 2 Press BS4 once within 5 minutes. If BS4 is not pushed within 5 minutes, P2 will be displayed on the user interface.
- 3 When the following LED display is shown, open valve A and close the front panel. If the front panel is left open, the system cannot operate properly during the refrigerant charging.

✨ ✨ \* \* \* \* \*

\* = The state of this LED is not important.

##### NOTICE

When a malfunction occurs, check the user interface display and refer to "5.6.5 Error codes when charging refrigerant" on page 20.

- 4 When the calculated amount of refrigerant minus 10 kg is reached, close valve A and press BS3 once.

✨ ✨ ✨ ✨ ✨ ✨ ✨

- 5 Press BS1 to complete charging.
- 6 Record the amount that was added on the additional refrigerant charge label provided with the unit and attach it on the back side of the front panel.
- 7 Perform the test procedure described in "7.5.3 Refrigerant added using manual charging (heating mode, pre-charging)" on page 37.

#### Manual refrigerant charging in cooling mode

- 1 Start up the unit and wait while it is preparing for charging in cooling mode.

Pressure control (first minute) ● ✨ ● ● ● ● ✨

Startup control (next 2 minutes) ● ✨ ● ● ● ✨ ●

Waiting for stable conditions (next ±15 minutes (depending on the system)) ● ✨ ● ● ● ✨ ✨

Ready for charging ✨ ✨ ✨ ● ✨ ● ✨

- 2 Press BS4 once within 5 minutes. If BS4 is not pushed within 5 minutes, P2 will be displayed on the user interface.
- 3 When the following LED display is shown, open valve A and close the front panel. If the front panel is left open, the system cannot operate properly during the refrigerant charging.

✨ ✨ \* \* \* \* \*

\* = The state of this LED is not important.

##### NOTICE

When a malfunction occurs, check the user interface display and refer to "5.6.5 Error codes when charging refrigerant" on page 20.

- 4 If the user interface display shows a flashing PE code, charging is almost finished. When the unit stops operating, close valve A immediately, check the LEDs, and check if P9 is displayed on the user interface. When the charging amount is little, the PE code may not be displayed, but instead P9 will be displayed immediately. If the LED display is not as shown below, correct the malfunction (as indicated on the user interface display) and restart the complete charging procedure.

✨ ✨ ✨ ✨ ✨ ✨ ✨

- 5 Press BS1 once to complete charging.
- 6 Record the amount that was added on the additional refrigerant charge label provided with the unit and attach it on the back side of the front panel.
- 7 Perform the test procedure described in "7.5.2 Refrigerant added using manual charging (cooling mode)" on page 37.

### 5.6.5 Error codes when charging refrigerant

#### Heating mode error codes

| Error code            | Solution   |
|-----------------------|--|
| P8 recharge operation | Close valve A immediately and press the TEST OPERATION button once. The operation will restart from the charging mode judgement onwards. |



| Error code                     | Solution  |
|--------------------------------|---|
| $P\bar{2}$<br>charging aborted | <ul style="list-style-type: none"> <li>Close valve A immediately. Check following items:                             <ul style="list-style-type: none"> <li>Is the gas side stop valve opened correctly?</li> <li>Is the valve of the refrigerant tank open?</li> <li>Are the air inlet and outlet of the indoor unit obstructed?</li> </ul> </li> <li>Correct the abnormality and restart the automatic charging procedure.</li> </ul> |

### Cooling mode error codes

| Error code   | Solution  |
|--|---|
| $P\bar{R}$ , $P\bar{H}$ , $P\bar{C}$<br>replace refrigerant tank | <ul style="list-style-type: none"> <li>Close valve A and replace the empty refrigerant tank. When replaced, open valve A (the outdoor unit will not stop operating).</li> <li>The code on the display shows the unit where a cylinder is to be renewed: <math>P\bar{R}</math> = master unit, <math>P\bar{H}</math> = slave unit 1, <math>P\bar{C}</math> = slave unit 2, flashing <math>P\bar{R}</math>, <math>P\bar{H}</math> and <math>P\bar{C}</math> = all units</li> </ul> |
| $P\bar{B}$<br>recharge operation                                 | Close valve A immediately. Restart the automatic charging procedure.  |
| $P\bar{2}$<br>charging aborted                                   | <ul style="list-style-type: none"> <li>Close valve A immediately. Check following items:                             <ul style="list-style-type: none"> <li>Is the gas side stop valve opened correctly?</li> <li>Is the valve of the refrigerant tank open?</li> <li>Are the air inlet and outlet of the indoor unit obstructed?</li> </ul> </li> <li>Correct the abnormality and restart the automatic charging procedure.</li> </ul>   |
| *<br>abnormal stop   | Close valve A immediately. Confirm the malfunction code on the user interface and correct the abnormality by following the information " <a href="#">7.6 Correcting after abnormal completion of the test run</a> " on page 38.   |

### 5.6.6 Final adjustment of the refrigerant amount

When the LEDs indicate that the indoor or outdoor temperature is out of range, automatic charging of refrigerant cannot be completed. When the temperature has come in range (outdoor = 0~43°C, indoor = 20~32°C), perform the overcharging judgement procedure to complete refrigerant charging.

Out of outdoor temperature range     ☼ ☼ ☼ ☼ ☼ ● ●

Out of indoor temperature range     ☼ ☼ ☼ ☼ ● ☼ ●

In this case, perform a test operation (see "[7.5 To perform a test run of the outdoor unit](#)" on page 37), and the unit will work properly. (Error code  $U\bar{3}$  will be displayed on the indoor unit.)

However, the refrigerant leak detection function cannot be used before completing the refrigerant charging operation and the judgement of the initial amount of refrigerant by performing the test operation again.

#### Overcharging judgement procedure

- Close all front panels except the electrical component box front panel and the lid on the side of the electrical component box.
- Turn on the power to the outdoor unit and all connected indoor units.
- Press BS1 once so the H1P LED is off.
- Press and hold BS4 down for 5 seconds.  
**Result:** The system will start to operate.
- Close all front panels.

**Result:** After operating for 40 minutes, operation will stop automatically.

- After the system has stopped operating, check the user interface display.
- If  $E\bar{3}$ ,  $F\bar{5}$  or  $U\bar{F}$  is displayed on the user interface as a result of the overcharging judgement procedure, recover 20% of the charged amount of refrigerant and perform this procedure again.
- When no more overcharging of refrigerant is detected, start automatic refrigerant charging from "[Step 6a: To automatically charge refrigerant](#)" on page 18.

### 5.6.7 To input the additional refrigerant charge weight

Availability of the leak detection function feature requires input of the additional refrigerant charge amount immediately after finishing automatic charging. The input must be executed before performing the test operation.



#### NOTICE

If a wrong value is input for the additional charged refrigerant weight, the accuracy of the leak detection function will decrease.

#### Procedure

- Close the electrical component box lid and all front panels except the one on the side of the electrical component box.
  - Press and hold BS1 for 5 seconds to enter setting mode 2.  
**Result:** The H1P LED is on.
  - Press BS2 14 times. The LED display will be as follows.  
☼ ● ● ☼ ☼ ☼ ●
  - Press BS3 to confirm.  
**Result:** LEDs will be blinking in function of the last entered setting (factory setting = 0 kg).
  - Enter the weighed and already recorded amount of additional refrigerant charge (not the total amount of refrigerant present in the system) by selecting the corresponding LED display. Press BS2 to scroll through the possible LED combinations until the LED combination corresponds to the weight of additional refrigerant charge you must input.
  - Press BS3 to select the required input and press the button again to confirm the input into the PCB.
- Possible LED combinations in function of weight of additional refrigerant charge (= x) to input

| Value number | Weight (kg) | LEDs          |
|--------------|-------------|---------------|
| 0            | x=0         | ☼ ● ● ● ● ● ● |
| 1            | 0<x<5       | ☼ ● ● ● ● ● ☼ |
| 2            | 5≤x<10      | ☼ ● ● ● ● ☼ ● |
| 3            | 10≤x<15     | ☼ ● ● ● ● ☼ ☼ |
| 4            | 15≤x<20     | ☼ ● ● ● ☼ ● ● |
| 5            | 20≤x<25     | ☼ ● ● ● ☼ ● ☼ |
| 6            | 25≤x<30     | ☼ ● ● ● ☼ ☼ ● |
| 7            | 30≤x<35     | ☼ ● ● ● ☼ ☼ ☼ |
| 8            | 35≤x<40     | ☼ ● ● ☼ ● ● ● |
| 9            | 40≤x<45     | ☼ ● ● ☼ ● ● ☼ |
| 10           | 45≤x<50     | ☼ ● ● ☼ ● ☼ ● |
| 11           | 50≤x<55     | ☼ ● ● ☼ ● ☼ ☼ |
| 12           | 55≤x<60     | ☼ ● ● ☼ ☼ ● ● |
| 13           | 60≤x<65     | ☼ ● ● ☼ ☼ ● ☼ |
| 14           | 65≤x<70     | ☼ ● ● ☼ ☼ ☼ ● |

## 5 Installation

| Value number | Weight (kg) | LEDs          |
|--------------|-------------|---------------|
| 15           | 70≤x<75     | ☀ ● ● ☀ ☀ ☀ ☀ |
| 16           | 75≤x<80     | ☀ ● ☀ ● ● ● ● |
| 17           | 80≤x<85     | ☀ ● ☀ ● ● ● ☀ |
| 18           | 85≤x<90     | ☀ ● ☀ ● ● ☀ ● |
| 19           | 90≤x<95     | ☀ ☀ ☀ ● ● ☀ ☀ |
| 20           | 95≤x<100    | ☀ ● ☀ ● ☀ ● ● |
| 21           | 100≤x       | ☀ ● ☀ ● ☀ ☀ ☀ |

- Press BS1 to return to setting mode 1 (= initial state).
- Perform a test operation as described in ["7.5 To perform a test run of the outdoor unit" on page 37](#).

### **i** INFORMATION

If you get confused in the middle of the process, push BS1. Then it returns to setting mode 1 (H1P is off).

- Resume the input procedure from step 2 onwards.

### 5.6.8 Checks after charging refrigerant

- Are all stop valves open?
- Is the amount of refrigerant, that has been added, recorded on the refrigerant charge label?

### **!** NOTICE

Make sure to open all stop valves after (pre-) charging the refrigerant.

Operating with the stop valves closed will damage the compressor.

### 5.6.9 To fix the fluorinated greenhouse gases label

- Fill in the label as follows:

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

- a**: Contains fluorinated greenhouse gases
- b**: **1** = [ ] kg
- c**: **2** = [ ] kg
- d**: **1+2** = [ ] kg
- e**:  $\frac{\text{GWP} \times \text{kg}}{1000} = [ ] \text{ tCO}_2\text{eq}$
- f**: RXXX, GWP: XXX

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

### **!** NOTICE

In Europe, the **greenhouse gas emissions** of the total refrigerant charge in the system (expressed as tonnes CO<sub>2</sub> equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

**Formula to calculate the greenhouse gas emissions:**  
 $\text{GWP value of the refrigerant} \times \text{Total refrigerant charge [in kg]} / 1000$

- Fix the label on the inside of the unit near the charging port (e.g. on the inside of the service cover).

## 5.7 Connecting the water piping

### 5.7.1 To connect the water piping

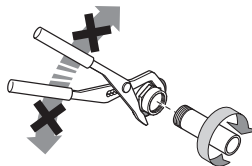
Water connections must be made in accordance with all applicable legislations and the outlook drawing delivered with the unit, respecting the water inlet and outlet.

### **!** NOTICE

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

If dirt gets in the water circuit, problems may occur. Therefore, always take into account the following when connecting the water circuit:

- Use clean pipes only.
- Hold the pipe end downwards when removing burrs.
- Cover the pipe end when inserting it through a wall so that no dust and dirt enter.
- When using non-brass metallic piping, make sure to insulate both materials from each other to prevent galvanic corrosion.
- Make sure to provide a proper drain for the pressure relief valve.
- Because brass is a soft material, use appropriate tooling for connecting the water circuit. Inappropriate tooling will cause damage to the pipes.



- For correct operation of the system, a regulating valve must be installed in the water system. The regulating valve is to be used to regulate the water flow in the system (field supply).

### 5.7.2 To fill the water circuit

- Connect the water supply to the drain and fill valve.
- Make sure the automatic air purge valve is open (at least 2 turns).
- Fill with water until the pressure gauge indicates a pressure of approximately 2.0 bar. Remove air in the circuit as much as possible using the air purge valves (refer to field setting [E-04] in ["6.1.9 Field settings on the user interface" on page 29](#)).

### **!** NOTICE

- Air in the water circuit can cause malfunctioning. During filling, it may not be possible to remove all the air from the circuit. Remaining air will be removed through the automatic air purge valves during the initial operating hours of the system. Additional filling with water afterwards may be required.
- To purge the system, use the special function as described in ["7 Commissioning" on page 35](#).

### **!** NOTICE

The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature).

However, at all times water pressure shall remain above 1 bar to avoid air entering the circuit.



**NOTICE**

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



**INFORMATION**

The unit may dispose of some excessive water through the pressure relief valve.

**5.7.3 To insulate the water piping**

The complete water circuit, inclusive all piping, must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity as well as prevention of freezing of the outside water piping during winter time. The thickness of the insulation materials must be at least 13 mm with  $\lambda=0.039$  W/mK in order to prevent freezing of the outside water piping at ambient temperature of  $-15^{\circ}\text{C}$ .

If the temperature is higher than  $30^{\circ}\text{C}$  and the humidity is higher than RH 80%, the thickness of the insulation materials should be at least 20 mm to prevent condensation on the surface of the insulation.

**5.8 Connecting the electrical wiring**

**5.8.1 Field wiring: Overview**

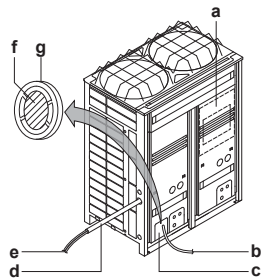
- Most field wiring on the unit is to be made on the terminal blocks inside the electrical component boxes. To gain access to the terminal blocks, remove the electrical component box service panel. See "5.1 Opening the units" on page 11.
- Cable tie mountings are provided at the wiring entries of the electrical component box.

The wiring diagram is delivered with the unit, located at the inside of the switch box cover.

**5.8.2 To route and fix the power supply**

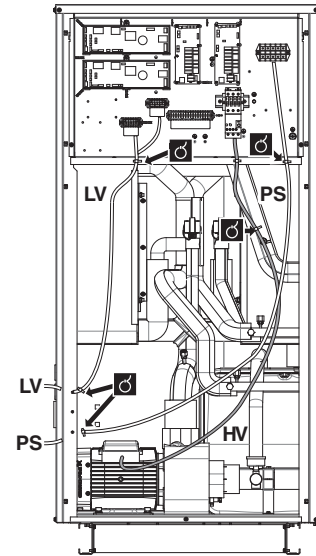
**To route and fix the power supply of the outdoor unit**

- Route the power wiring and the transmission wiring through a conduit hole.
- Route the power wiring through the upper hole in the left side plate, from the front position of the main unit (through the conduit hole of the wiring mounting plate), or from a knockout hole in the unit's bottom plate.



- a Electric wiring diagram (printed on the back of the electrical component box lid)
- b Transmission wiring
- c Pipe opening
- d Conduit
- e Power wiring and ground wiring
- f Remove this part before use.
- g Through cover

**To route and fix the power supply of the indoor unit**

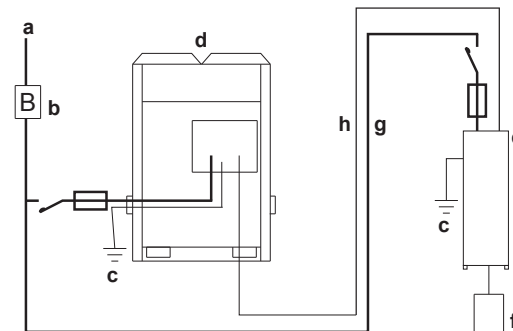


- PS Power supply
- HV High voltage
- LV Low voltage

Guide the cables as much as possible through the provided cable entry glands.

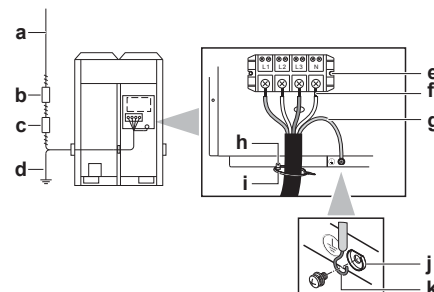
It is important to keep the power supply and the transmission wiring separated from each other. In order to avoid any electrical interference the distance between both wirings should ALWAYS be at least 50 mm.

**System example**



- a Field power supply
- b Main switch
- c Earth leakage breaker
- d Outdoor unit
- e Indoor unit
- f User interface
- g Power supply wiring (sheathed cable) (230 V)
- h Transmission wiring (sheathed cable) (16 V)

**5.8.3 To connect the power supply of the outdoor unit**



- a Power supply (400 V, 3N~ 50 Hz)

## 5 Installation

- b Fuse
- c Earth leakage breaker
- d Grounding wire
- e Power supply terminal block
- f Connect each power wire
- g RED to L1, WHT to L2, BLK to L3 and BLU to N
- h Ground wire (GRN/YLW)
- i Clamp the power wire to the plastic bracket using a field supplied clamp to prevent external force being applied to the terminal.
- j Clamp (field supply)
- k Cup washer
- l When connecting the earth wire, it is recommended to perform curling.

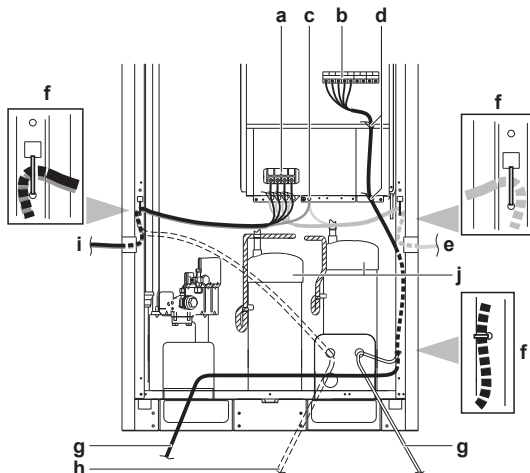
### CAUTION

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 tightened before the earth wire is in case the power supply is pulled loose from the stress relief.

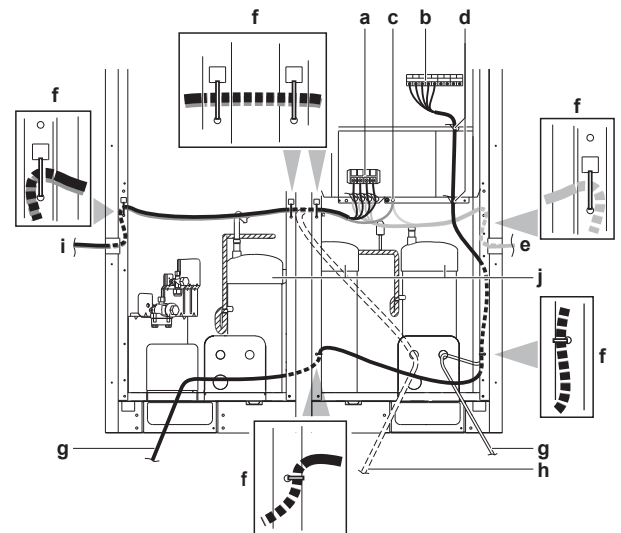
### NOTICE

When routing earth wires, secure clearance of 50 mm or more away from compressor lead wires. Failure to observe this instruction properly may adversely affect correct operation of other units connected to the same earth.

SERHQ020



SERHQ032



- a Electrical wiring
- b Wiring between units
- c Earth wire
- d Clamp to the electrical component box with field supplied clamps.
- e When routing out the power/ground wires from the right side
- f Clamp to the back of the column support with field supplied clamps.
- g When routing out the inter-unit wirings from the opening for piping
- h When routing out the power/ground wires from the front
- i When routing out the ground wires from the left side
- j When wiring, do not detach the acoustic insulators from the compressor.

### NOTICE

When routing the remote control cord and inter-unit wiring, secure clearance of 50 mm or more away from the power wiring. Ensure that the power wiring does not contact any heated sections. When wiring, pay attention not to detach the acoustic insulators from the compressor.

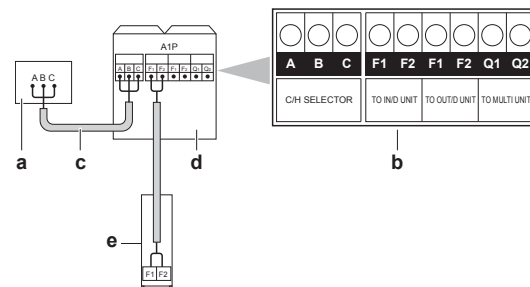
### NOTICE

Recommendations when connecting the earth wire:

Wire it so that it comes through the cut out section of the cup washer. (An improper earth connection may prevent a good earthing from being achieved.)

### Tightening torque for the terminal screws

| Screw size                            | Tightening torque (N·m) |
|---------------------------------------|-------------------------|
| M8 (Power terminal block)             | 5.5~7.3                 |
| M8 (earth)                            |                         |
| M3 (Inter-unit wiring terminal block) | 0.8~0.97                |

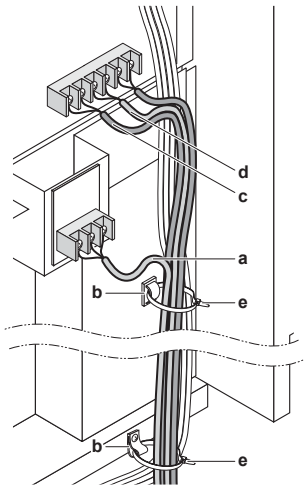


- a Cool/heat selector
- b Outdoor unit PCB (A1P)
- c Take care of the polarity
- d Outdoor unit

e Indoor unit

The wiring for the other systems must be connected to the F1/F2 (Out-Out) terminals of the PCB in the outdoor unit to which the interconnecting wiring for the indoor units is connected.

### Fixing the transmission wiring



- a Heating/cooling switching remote control cord (when a heating/cooling switch remote control (optional) is connected) (ABC)
- b Fix to the indicated plastic brackets using field supplied clamping material.
- c Wiring between the units (indoor - outdoor) (F1+F2 left)
- d Wiring between the units (outdoor - outdoor) (F1+F2 right)
- e Plastic bracket

#### NOTICE

Never connect the power supply to transmission wiring terminal block. Otherwise the entire system may break down.

#### NOTICE

Never connect 400 V to transmission wiring terminal block. Otherwise the entire system may break down.

The wiring from the indoor units must be connected to the F1/F2 (In-Out) terminals on the outdoor unit PCB.

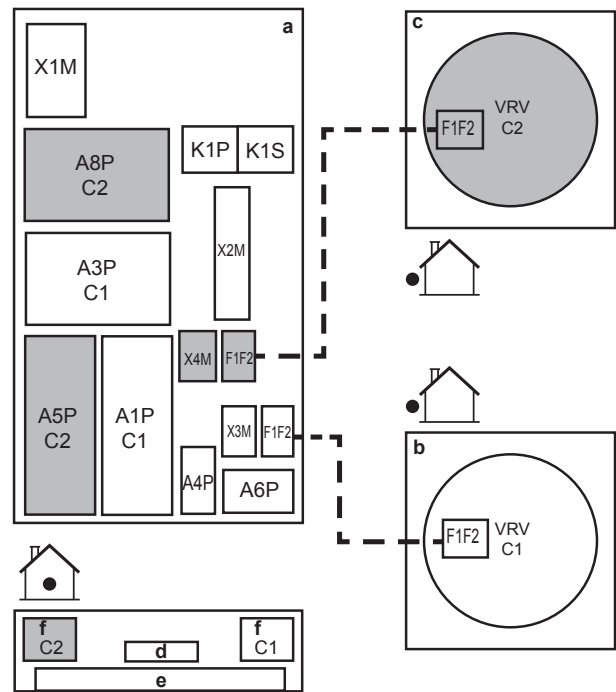
#### NOTICE

Take care of the polarity of the transmission wiring.

The outdoor unit PC board (A1P) is factory set to "Sequential start available".

### 5.8.4 To connect the power supply and transmission cables

- 1 Open the electrical component box cover.
- 2 Using the appropriate cable, connect the power supply and communication cable(s) to the appropriate terminals as shown on the wiring diagram.
- 3 Fix the cables with cable ties to the cable tie mountings to ensure strain relief and to make sure that they do not come in contact with the piping and sharp edges. Never squeeze bundled cables.
- 4 Close the electrical component box cover.



- a Switchbox
- b Outdoor unit 1
- c Outdoor unit 2 (only in case of SEHVX40+64BAW)
- d Pump
- e Switchbox
- f Evaporator

#### NOTICE

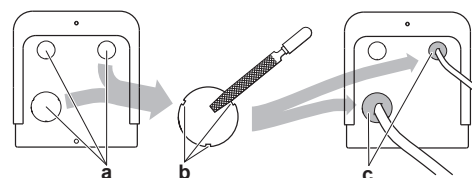
The power supply cable and the communication cable are not included.

#### NOTICE

When installing the power supply wiring, also refer to the figure in "5.4.3 To connect the refrigerant piping to the indoor unit" on page 16.

### 5.8.5 Guidelines when knocking out knockout holes

- To punch a knockout hole, hit on it with a hammer.
- After knocking out the holes, we recommend removing any burrs and paint the edges and areas around the holes using repair paint to prevent rusting.
- When passing electrical wiring through the knockout holes, prevent damage to the wires by wrapping the wiring with protective tape, putting the wires through field supplied protective wire conduits at that location, or install suitable field supplied wire nipples or rubber bushings into the knockout holes.
- When you do not use a wire conduit, protect the wires with vinyl tubes to prevent the edge of the knockout hole from cutting the wires.



- a Knockout hole
- b Burr
- c If there are any possibilities that small animals enter the system through the knockout holes, plug the holes with packing materials (to be prepared on-site)



## 6 Configuration

### 5.8.6 To install the user interface

The unit comes with a user interface offering a user-friendly way to set up, use and maintain the unit. Before operating the user interface, follow this installation procedure.

| Wire specification | Value                     |
|--------------------|---------------------------|
| Type               | 2 wire                    |
| Section            | 0.75~1.25 mm <sup>2</sup> |
| Maximum length     | 500 m                     |



#### NOTICE

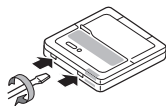
The wiring for connection is NOT included.



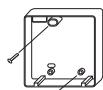
#### NOTICE

The user interface MUST be mounted indoors.

- 1 Insert a slotted screwdriver into the slots in the rear part of the user interface, and remove the front part of the user interface.



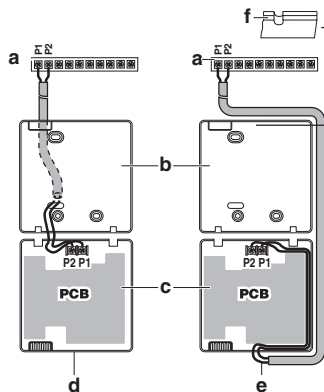
- 2 Fasten the user interface on a flat surface.



#### NOTICE

Be careful NOT to distort the shape of the lower part of the user interface by overtightening the mounting screws.

- 3 Connect the terminals of the user interface and the terminals inside the unit (P1 to P1, P2 to P2) as shown in the figure.

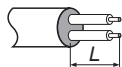


- a Unit
- b Rear part of the user interface
- c Front part of the user interface
- d Wired from the rear
- e Wired from the top
- f Use nippers to notch the part for the wiring to pass through

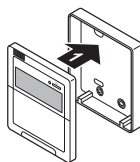


#### NOTICE

- When wiring, run the wiring away from the power supply wiring in order to avoid receiving electric noise (external noise).
- Peel the shield for the part that has to pass through the inside of the user interface case (L).



- 4 Reattach the upper part of the user interface, starting with the clips at the bottom.

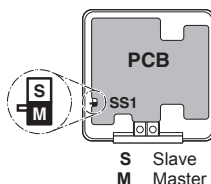


#### CAUTION

Do NOT pinch the wiring when attaching.

If, in addition to the standard user interface, an optional user interface (EKRUHTB) is installed as well:

- 5 Connect the electrical wires of both user interfaces as described.
- 6 Select a master and a slave user interface using the SS1 selector switch.



#### INFORMATION

Only the user interface set as master can be used as a room thermostat.

### 5.8.7 To install optional equipment

For the installation of optional equipment, refer to the installation manual which is delivered with the optional equipment or the addenda delivered with this unit.

## 6 Configuration

### 6.1 Making field settings

#### 6.1.1 About making field settings



#### INFORMATION

The LEDs and buttons are located in the outdoor unit.

If required, carry out field settings according to the following instructions. Refer to the service manual for more details.

#### Pushbuttons and DIP switches

| Item         | Description  |
|--------------|--|
| Pushbuttons  | By operating the pushbuttons it is possible to: <ul style="list-style-type: none"> <li>Change the mode.</li> <li>Perform field settings (demand operation, low noise, etc).</li> </ul>   |
| DIP switches | <ul style="list-style-type: none"> <li>DS1 (1): COOL/HEAT selector</li> <li>DS1 (2~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING.</li> <li>DS2 (1~4): NOT USED. DO NOT CHANGE THE FACTORY SETTING.</li> <li>DS3 (1+2): NOT USED. DO NOT CHANGE THE FACTORY SETTING.</li> </ul> |

## Mode 1 and 2

| Mode                            | Description   |
|---------------------------------|---|
| Mode 1<br>(monitoring settings) | Mode 1 can be used to monitor the current situation of the outdoor unit. Some field setting contents can be monitored as well.  |
| Mode 2<br>(field settings)      | <p>Mode 2 is used to change the field settings of the system. Consulting the current field setting value and changing the current field setting value is possible.</p> <p>In general, normal operation can be resumed without special intervention after changing field settings.</p> <p>Some field settings are used for special operation (e.g., 1 time operation, recovery/vacuuming setting, manual adding refrigerant setting, etc.). In such a case, it is required to abort the special operation before normal operation can restart. It will be indicated in below explanations.</p> |

To continue the configuration of the system, it is required to give some input to the PCB of the unit. This chapter will describe how manual input is possible by operating the pushbuttons/DIP switches on the PCB and reading the feedback from the LEDs.



### INFORMATION

If you get confused in the middle of the process, push BS1. Then it returns to setting mode 1 (H1P is off).

## 6.1.2 Field setting components

The components to make field settings are as follows:

| MODE | TEST: | C/H SELECT |     | L.N.O.P. | DEMAND | MULTI |     |
|------|-------|------------|-----|----------|--------|-------|-----|
| H1P  | H2P   | H3P        | H4P | H5P      | H6P    | H7P   | H8P |
|      |       |            |     |          |        |       |     |

|      |     |        |      |       |
|------|-----|--------|------|-------|
|      |     |        |      |       |
| MODE | SET | RETURN | TEST | RESET |

**H1P~H8P** LEDs  
**BS1~BS5** Pushbuttons  
**DS1~DS3** DIP switches  
 ON ( ) OFF ( ) Flashing ( )

### Pushbuttons

Use the pushbuttons to make the field settings.

- BS1** MODE: For changing the set mode
- BS2** SET: For field setting
- BS3** RETURN: For field setting
- BS4** TEST: For test operation
- BS5** RESET: For resetting the address when the wiring is changed or when an additional indoor unit is installed

### LEDs

The LEDs give feedback about the field settings, which are defined as [Mode-Setting]=Value.

- H1P** Shows the mode
- H2P~H7P** Shows the settings and values, represented in binary code
- H8P** NOT used for field settings, but used during initialisation

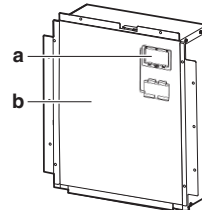
### Example:

| [H1P- 32 + 16 + 8 + 4 + 2 + 1]<br>H1P H2P H3P H4P H5P H6P H7P | Description                    |
|---|--------------------------------|
|   | Default situation<br>(H1P OFF) |
|   | Mode 1<br>(H1P flashing)       |
|   | Mode 2<br>(H1P ON)             |

| [H1P- 32 + 16 + 8 + 4 + 2 + 1]<br>H1P H2P H3P H4P H5P H6P H7P | Description              |
|---|--------------------------|
|   | Setting 8<br>(in mode 2) |
|   | Value 4<br>(in mode 2)   |

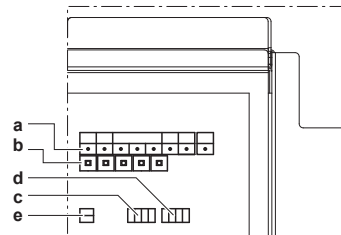
## 6.1.3 To access the field setting components

Remove the inspection cover to carry out field settings.



- a Inspection cover
- b Switch box cover

You can see the 5 pushbuttons, 8 LEDs and 3 DIP switches.



- a H1P~H8P LEDs
- b BS1~BS5 pushbuttons
- c DS1 DIP switch 1
- d DS2 DIP switch 2
- e DS3 DIP switch 3

Operate the switches and pushbuttons with an insulated stick (such as a closed ball-point pen) to avoid touching of live parts.



Make sure to re-attach the inspection cover into the electrical component box cover after the job is finished.



### NOTICE

Make sure that all outside panels, except for the service cover on the electrical component box, are closed while working.

Close the lid of the electrical component box firmly before turning on the power.

## 6.1.4 To access mode 1 or 2

After the unit is turned ON, the display goes to its default situation. From there, you can access mode 1 and mode 2.

### Initialisation: default situation



### NOTICE

Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

Turn on the power supply of the outdoor unit and the indoor unit. After initialisation, the display indication state will be as below (default situation when shipped from factory).

## 6 Configuration

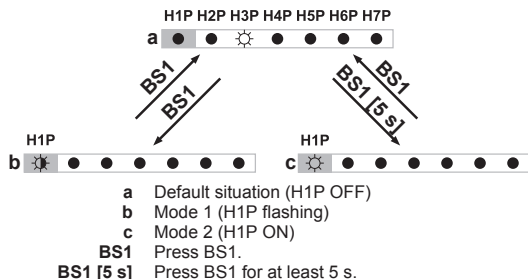
|              |                                 |
|--------------|---------------------------------|
|              | H1P H2P H3P H4P H5P H6P H7P H8P |
| Outdoor unit | ● ● ● ● ● ● ● ●                 |

If the default situation is not displayed after 10~12 minutes, check the malfunction code. Solve the malfunction code accordingly.

The HAP LED flashes to indicate normal microcomputer operation.

### Switching between modes

Use BS1 to switch between the default situation, mode 1 and mode 2.



### INFORMATION

If you get confused in the middle of the process, press BS1 to return to the default situation.

### 6.1.5 To use mode 1

Mode 1 is used to monitor the status of the unit.

| What                                     | How  |
|--|--|
| Accessing monitoring mode 1              | Once mode 1 is selected (push BS1 one time), you can select the wanted setting. It is done by pushing BS2. |
| To quit and return to the initial status | Press BS1.   |

### 6.1.6 To use mode 2

The master unit should be used to input field settings in mode 2.

Mode 2 is used to set field settings of the outdoor unit and system.

| What   | How   |
|--|---|
| Changing and accessing the setting in mode 2         | Once mode 2 is selected (push BS1 for more than 5 seconds), you can select the wanted setting. It is done by pushing BS2.<br><br>Accessing the selected setting's value is done by pushing BS3 1 time.  |
| To quit and return to the initial status             | Press BS1.  |
| Changing the value of the selected setting in mode 2 | <ul style="list-style-type: none"> <li>Once mode 2 is selected (push BS1 for more than 5 seconds) you can select the wanted setting. It is done by pushing BS2.</li> <li>Accessing the selected setting's value is done by pushing BS3 1 time.</li> <li>Now BS2 is used to select the required value of the selected setting.</li> <li>When the required value is selected, you can define the change of value by pushing BS3 1 time.</li> <li>Press BS3 again to start operation according to the chosen value.</li> </ul> |























### 6.1.7 Mode 1: Monitoring settings

In mode 1 (and in default situation) you can read out the following information:

|     | Value / Description  |
|-----|--|
| H2P | Shows the present operation state.   |
|     | OFF ● ● ● ● ● ● ● ●<br>Normal operation state.   |
|     | ON ● ● ● ● ● ● ● ●<br>Abnormal operation state.  |
|     | FLASHING ● ● ● ● ● ● ● ●<br>Under preparation or under test preparation  |
| H6P | Shows the status of low noise operation.   |
|     | OFF ● ● ● ● ● ● ● ●<br>Unit is currently not operating under low noise restrictions.   |
|     | ON ● ● ● ● ● ● ● ●<br>Unit is currently operating under low noise restrictions.  |
|     | Low noise operation reduces the sound generated by the unit compared to nominal operating conditions.<br><br>Low noise operation can be set in mode 2. There are two methods to activate low noise operation of the compressor unit and heat exchanger unit. <ul style="list-style-type: none"> <li>The first method is to enable an automatic low noise operation during night time by field setting. The unit will operate at the selected low noise level during the selected time frames.</li> <li>The second method is to enable low noise operation based on an external input. For this operation an optional accessory is required.</li> </ul> |
| H7P | Shows the status of power consumption limitation operation.  |
|     | OFF ● ● ● ● ● ● ● ●<br>Unit is currently not operating under power consumption limitations.  |
|     | ON ● ● ● ● ● ● ● ●<br>Unit is currently operating under power consumption limitation.  |
|     | Power consumption limitation reduces the power consumption of the unit compared to nominal operating conditions.<br><br>Power consumption limitation can be set in mode 2. There are two methods to activate power consumption limitation of the compressor unit. <ul style="list-style-type: none"> <li>The first method is to enable a forced power consumption limitation by field setting. The unit will always operate at the selected power consumption limitation.</li> <li>The second method is to enable power consumption limitation based on an external input. For this operation an optional accessory is required.</li> </ul>            |

6.1.8 Mode 2: Field settings

Press the BS2 button to make field settings to configure the system. The LEDs give a binary representation of the setting/value number.

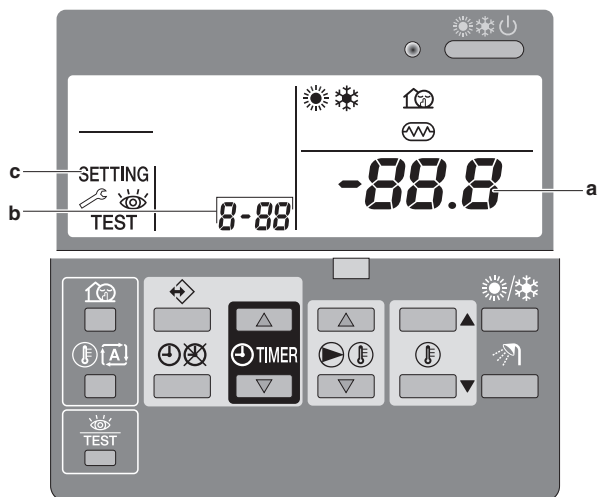
| Setting<br>H1P H2P H3P H4P H5P H6P H7P (= binary)  | Value   |              |                         |
|--|---|--------------|-------------------------|
|  | H1P H2P H3P H4P H5P H6P H7P   | Description  |                         |
| <br>Fan high static pressure setting.<br>In order to increase the static pressure the outdoor unit fan is delivering, this setting should be activated.   | <br>(default)   | Deactivated. |                         |
|  |                 | Activated.   |                         |
| <br>Automatic low noise setting and level during night time.<br>By changing this setting, you activate the automatic low noise operation function of the unit and define the level of operation. Depending on the chosen level, the noise level will be lowered.  | <br>(default)   | Deactivated  |                         |
|  |                 | Level 1      | Level 3<Level 2<Level 1 |
|  |                 | Level 2      |                         |
|  |                 | Level 3      |                         |
| <br>Low noise operation level via the external control adaptor.<br>If the system needs to be running under low noise operation conditions when an external signal is sent to the unit, this setting defines the level of low noise that will be applied.<br>This setting will only be effective when the optional external control adaptor (DTA104A62) is installed and setting [2-12] was activated.   | <br>(default)   | Level 1      | Level 3<Level 2<Level 1 |
|  |                 | Level 2      |                         |
|  |                 | Level 3      |                         |
| <br>Power consumption limitation level via the external control adaptor (DTA104A62)<br>If the system needs to be running under power consumption limitation conditions when an external signal is sent to the unit, this setting defines the level power consumption limitation that will be applied. The level is according to the table.  | <br>(default)   | Level 1      | Level 3<Level 2<Level 1 |
|  |                 | Level 2      |                         |
|  |                 | Level 3      |                         |
| <br>Enable the low noise function and/or power consumption limitation via the external control adaptor (DTA104A62).<br>If the system needs to be running under low noise operation or under power consumption limitation conditions when an external signal is sent to the unit, this setting should be changed. This setting will only be effective when the optional external control adaptor (DTA104A62) is installed in the indoor unit.  | <br>(default) | Deactivated. |                         |
|  |               | Activated.   |                         |
| <br>Refrigerant recovery/vacuumping mode.<br>This is a field setting of the outdoor module. In case of SEHVX40+64BAW, perform the setting on both outdoor modules.<br>In order to achieve a free pathway to reclaim refrigerant out of the system or to remove residual substances or to vacuum the system, it is necessary to apply a setting which will open the required valves in the refrigerant circuit so the reclaim of refrigerant or vacuumping process can be done properly.<br>To stop the refrigerant recovery/vacuumping mode, push BS1. If BS1 is not pushed, the system will remain in refrigerant recovery/ vacuumping mode. | <br>(default) | Deactivated  |                         |
|  |               | Activated    |                         |

6.1.9 Field settings on the user interface

The user can change the field settings using the user interface.

Each field setting is assigned a 3-digit number or code, e.g. [5-03], which is indicated on the user interface display. The first digit [5] is the 'first code' or field setting group. The second and third digit [03] together are the 'second code'.

## 6 Configuration



- 1 Press for a minimum of 5 seconds to enter the field setting mode.

**Result:** SETTING (c), the current selected field setting code 8-88 (b) and the set value -88.8 (a) are displayed.

- 2 Press to select the appropriate field setting first code.
- 3 Press to select the appropriate field setting second code.
- 4 Press and to change the value of the selected field setting.
- 5 Press to save the new value.

- 6 Repeat the previous steps to change other field settings as required.
- 7 When finished, press to exit the field setting mode.

### INFORMATION

- Changes made to a specific field setting are only stored when is pressed. Navigating to a new field setting code or pressing will discard any changes.
- Field settings are grouped by their first code, e.g. field settings [0-00]; [0-01]; [0-02]; [0-03] are defined as "Group 0". When different values are changed within the same group, pressing will save all the values changed within this group.

### INFORMATION

- Before shipping, the set values have been set as shown in "6.1.9 Field settings on the user interface" on page 29.
- When exiting the field setting mode, "88" may be displayed on the user interface display while the unit initializes itself.

### [0] Remote control setup

#### [0-00] User permission level

The user permission level defines which buttons and functions are available for the user. By default no level is defined, so all buttons and functions are operable.

| [0-00] | Description        |
|--------|--------------------|
| 2      | Permission level 2 |
| 3      | Permission level 3 |

|   | Master | Slave | Permission level 2 | Permission level 3 |
|---|--------|-------|--------------------|--------------------|
| Operation ON/OFF                            | ✓      | ✓     | ✓                  | ✓                  |
| Setting the leaving water temperature       | ✓      | ✓     | ✓                  | —                  |
| Setting the room temperature                | ✓      | ✓     | ✓                  | ✓                  |
| Quiet mode ON/OFF                           | ✓      | ✓     | —                  | —                  |
| Weather dependent setpoint operation ON/OFF | ✓      | ✓     | ✓                  | —                  |
| Setting the clock                           | ✓      | ✓     | —                  | —                  |
| Programming the schedule timer              | ✓      | —     | —                  | —                  |
| Schedule timer operation ON/OFF             | ✓      | —     | ✓                  | ✓                  |
| Field settings                              | ✓      | —     | —                  | —                  |
| Error code display                          | ✓      | ✓     | ✓                  | ✓                  |
| Test operation                              | ✓      | ✓     | —                  | —                  |

After entering the field setting, the selected permission level must be enabled by simultaneously pressing and , immediately followed by simultaneously pressing and . Keep all 4 buttons pressed for at least 5 seconds. Note that no indication on the user interface is given. After the procedure the blocked buttons will not be available anymore.

Deactivating the selected permission level is done in the same way.

#### [0-01] Room temperature compensation value

If necessary, it is possible to adjust some thermistor value of the unit by a correction value. This can be used as countermeasure for thermistor tolerances or capacity shortage.

The compensated temperature (= measured temperature plus compensation value) is then used to control the system and will be displayed in the temperature read-out mode. See also field setting [9] in this chapter for compensation values for leaving water temperature.

#### [0-02]

This setting is not applicable.

#### [0-03] Status

Defines whether the ON/OFF instruction can be used in the schedule timer for space heating.

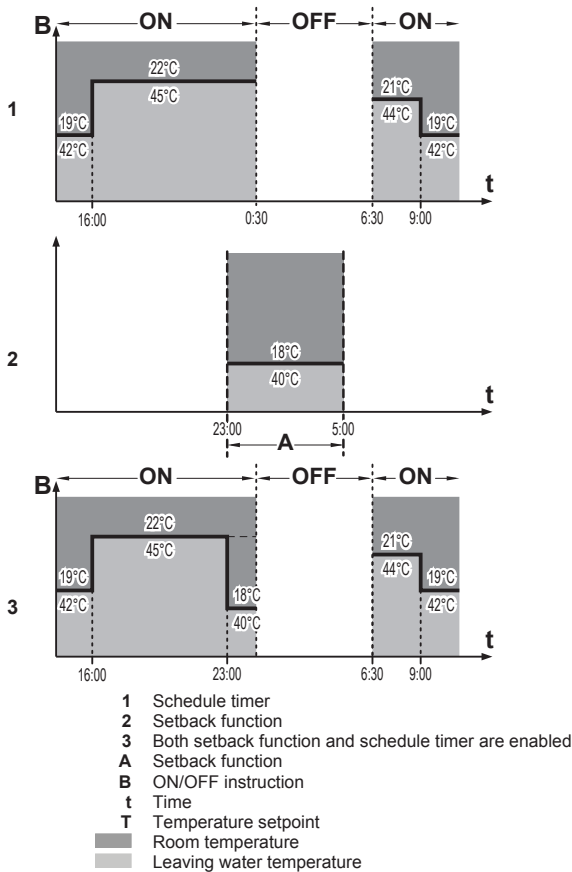
| [0-03]      | Description   |
|-------------|---|
| 0           | Space heating schedule timer based on ON/OFF instruction.   |
| 1 (default) | Space heating schedule timer based on temperature setpoint. |

| Space heating based on ON/OFF instruction |  |
|---|--|
| During operation                          | When the schedule timer switches space heating OFF, the controller will be switched off (operation LED will stop working). |



| Space heating based on ON/OFF instruction |   |
|---|---|
| Press <b>☰</b>                            | <p>The schedule timer for space heating will stop (when active at that moment) and will start again at the next scheduled ON function.</p> <p>The "last" programmed command overrides the "preceding" programmed command and will remain active until the "next" programmed command occurs.</p> <p>Example: imagine the actual time is 17:30 and actions are programmed at 13:00, 16:00 and 19:00. The "last" programmed command (16:00) overruled the "previous" programmed command (13:00) and will remain active until the "next" programmed command (19:00) occurs.</p> <p>So in order to know the actual setting, you should consult the last programmed command (this may date from the day before).</p> <p>The controller is switched off (operation LED off), but the schedule timer icon remains on.</p> |
| Press <b>☒/⊙</b>                          | <p>The schedule timer for space heating and the quiet mode stops and will not start again.</p> <p>The schedule timer icon is not displayed any more.</p>  |

- Operation example: Schedule timer based on ON/OFF instruction. When the setback function (see field setting [2]) is enabled, the setback operation will have priority over the scheduled action in the schedule timer if ON instruction is active. If OFF instruction is active this will have priority over the setback function. At any time the OFF instruction will have the highest priority.

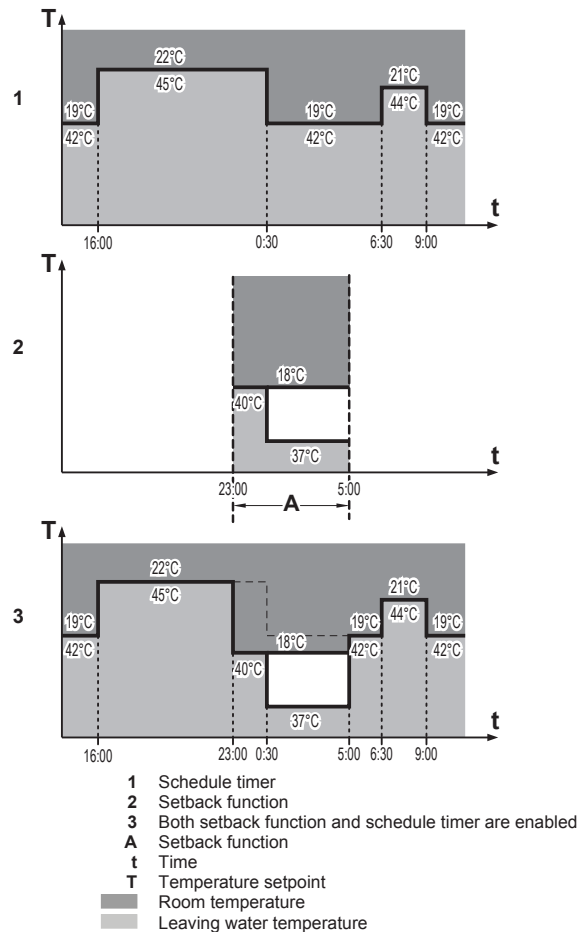


| Space heating based on temperature setpoint <sup>(a)</sup> |  |
|--|--|
| During operation   | During schedule timer operation the operation LED is lit continuously.   |
| Press <b>☰</b>   | <p>The schedule timer for space heating stops and will not start again.</p> <p>The controller is switched off (operation LED off).</p>                   |
| Press <b>☒/⊙</b>   | <p>The schedule timer for space heating and the quiet mode stops and will not start again.</p> <p>The schedule timer icon is not displayed any more.</p> |

(a) For leaving water temperature and/or room temperature

- Operation example: Schedule timer based on temperature setpoint

When the setback function (see field setting [2]) is enabled, the setback operation will have priority over the scheduled action in the schedule timer.



### [0-04] Status

Defines whether the ON/OFF instruction can be used in the schedule timer for cooling.

This is the same as for space heating [0-03], but the setback function is not available.

### [1] Settings are not applicable

### [2] Automatic setback function

### **i** INFORMATION

This function is available for heat pump units operating in heating mode ONLY. It does NOT exist for cooling.

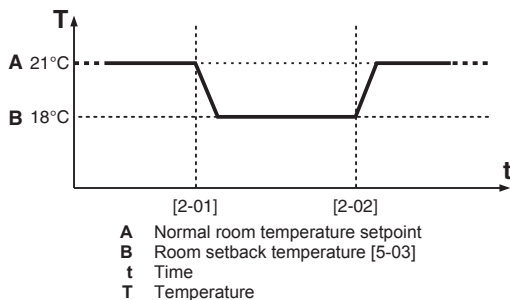
## 6 Configuration

The setback function provides the possibility to lower the room temperature. It can be activated e.g. during the night, because temperature demands during night and day are not the same.

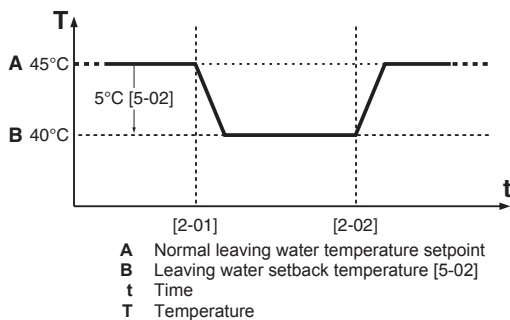
### **i** INFORMATION

- The setback function is enabled by default.
- The setback function can be combined with the automatic weather dependent setpoint operation.
- Setback function is an automatic daily scheduled function.

Setback configured for room temperature control



Setback configured for leaving water temperature control



See field setting [5] in this chapter for temperature setpoints.

### [2-00] Status

| [2-00] | Description                       |
|--------|-----------------------------------|
| 0      | The setback function is disabled. |
| 1      | The setback function is enabled.  |

### [2-01] Start time

Time at which setback is started.

### [2-02] Stop time

Time at which setback is stopped.

### [3] Weather dependent setpoint

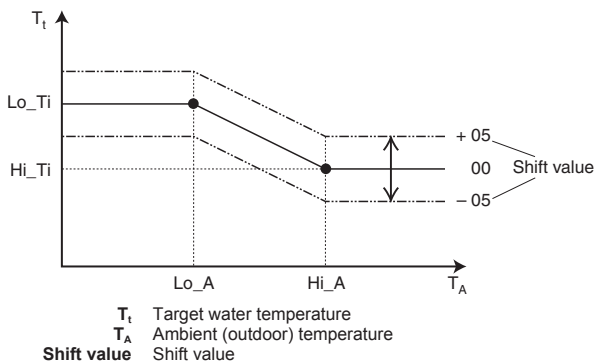
### **i** INFORMATION

This function is available for heat pump units operating in heating mode ONLY. It does NOT exist for cooling.

When weather dependent operation is active, the leaving water temperature is determined automatically depending on the outdoor temperature: colder outdoor temperatures will result in warmer water and vice versa. The unit has a floating setpoint. Activating this operation will result in a lower power consumption than use with a manually fixed leaving water setpoint.

During weather dependent operation, the user has the possibility to shift up or down the target water temperature by a maximum of 5°C. This "Shift value" is the temperature difference between the temperature setpoint calculated by the controller and the real setpoint. E.g. a positive shift value means that the real temperature setpoint will be higher than the calculated setpoint.

It is advised to use the weather dependent setpoint because it adjusts the water temperature to the actual needs for space heating. It will prevent the unit from switching too much between thermo ON operation and thermo OFF operation when using the user interface room thermostat or external room thermostat.



### [3-00] Low ambient temperature (Lo\_A)

Low outdoor temperature.

### [3-01] High ambient temperature (Hi\_A)

High outdoor temperature.

### [3-02] Setpoint at low ambient temperature (Lo\_Ti)

The target outgoing water temperature when the outdoor temperature equals or drops below the low ambient temperature (Lo\_A).

Lo\_Ti should be higher than Hi\_Ti, as warmer water is required for colder outdoor temperatures.

### [3-03] Setpoint at high ambient temperature (Hi\_Ti)

The target outgoing water temperature when the outdoor temperature equals or rises above the high ambient temperature (Hi\_A).

Hi\_Ti should be lower than Lo\_Ti, as less warm water suffices for warmer outdoor temperatures.

### **i** INFORMATION

If the value of [3-03] is mistakenly set higher than the value of [3-02], the value of [3-03] will always be used.

### [4] Settings are not applicable

### [5] Automatic setback

### [5-00]

This setting is not applicable.

### [5-01]

This setting is not applicable.

### [5-02] Leaving water setback temperature

### [5-03] Room setback temperature

### [5-04]

This setting is not applicable.

### [6] Option setup

### [6-01] External room thermostat option

If an optional external room thermostat is installed, its operation must be enabled by this field setting.

The external room thermostat only gives an ON/OFF signal to the heat pump based on the room temperature. Because it does not give continuous feedback information to the heat pump, it is supplementary to the user interface room thermostat function. To have a good control of the system and avoid frequent ON/OFF it is advised to use the automatic weather dependent setpoint operation.

| [6-01]      | Description  |
|-------------|--|
| 0 (default) | External room thermostat not installed.  |
| 1           | External room thermostat input 1 = heating operation ON (1)/OFF (0).<br>External room thermostat input 2 = cooling operation ON (1)/OFF (0). |
| 2           | External room thermostat input 1 = operation ON (1)/OFF (0).<br>External room thermostat input 2 = cooling (1)/heating (0).                  |

**[7] Option setup****[7-00] Forced pump operation**

| [7-00]      | Description  |
|-------------|--|
| 0           | The pump performs intermittent sampling during thermo off conditions. This setting is often used when the unit is controlled by a room thermostat. |
| 1 (default) | The pump continues operation during thermo off conditions.   |

**[8] Option setup****[8-00] User interface temperature control**

| [8-00]      | Description   |
|-------------|---|
| 0 (default) | The unit operates in leaving water temperature control.   |
| 1           | The unit operates in room temperature control. This means that the user interface is used as a room thermostat, so the user interface can be placed in the living room to control the room temperature. |

**Note:** When the unit is operated in room temperature control (by user interface or external room thermostat option), room temperature has priority over leaving water setpoint.

**[8-01]**

This setting is not applicable.

**[8-03]**

This setting is not applicable.

**[8-04] Freeze-up prevention**

Freeze-up prevention will be activated by starting up the pump to circulate the water, and if the leaving or return water temperature is <5°C for 5 minutes, the unit will start up in heating mode to prevent too low temperatures.

The freeze-up prevention is only active when the unit is in thermo OFF condition.

The option can be enabled when there is no optional heater tape or glycol in the system and when heat can be used from an application.

| [8-04]      | Description  |
|-------------|--|
| 0 (default) | No freeze-up prevention  |
| 1           | Freeze-up prevention level 1 (outdoor temperature <4°C and leaving or return water temperature <7°C) |
| 2           | Freeze-up prevention level 2 (outdoor temperature <4°C)  |

**[9] Automatic temperature compensation**

If necessary, it is possible to adjust some thermistor value of the unit by a correction value. This can be used as countermeasure for thermistor tolerances or capacity shortage.

The compensated temperature (= measured temperature plus compensation value) is then used to control the system and will be displayed in the temperature read-out mode.

**[9-00] Leaving water temperature compensation value for heating operation****[9-01] Leaving water thermistor auto corrective function**

This function will take into account the outdoor ambient conditions and correct the measured value which will be used for the logic.

E.g. when the ambient temperature is high during cooling mode, the logic will correct the measured value of the leaving water thermistor to a lower value to take into account influence of high ambient temperatures in the measurement.

**[9-02]**

This setting is not applicable.

**[9-03] Leaving water temperature compensation value for cooling operation****[9-04]**

This setting is not applicable.

**[A] Option setup****[A-00]**

This setting is not applicable.

**[A-01]**

This setting is not applicable.

**[A-02] Return water temperature undershoot value**

This setting makes it possible to set the allowable undershoot when operating the unit during heating THERMO ON/OFF condition.

The unit will go in THERMO ON only if the return water temperature (RWT) goes below the setpoint minus the differential temperature:

Thermo ON:  $RWT < \text{Setpoint} - (([A-02]/2) + 1)$

The setting [A-02] has a variability range from 0 to 15 and the step is 1 degree. The default value is 5, meaning that the differential temperature default value is 3.5.

**[A-03] Leaving water temperature overshoot/undershoot value**

This setting makes it possible to set the allowable overshoot (heating)/undershoot (cooling) when operating the unit during leaving water control.

**[b] Settings are not applicable****[C] Leaving water temperature limits**

This setting is used to limit the selectable leaving water temperature on the user interface.

**[C-00] Maximum leaving water setpoint in heating operation****[C-01] Minimum leaving water setpoint in heating operation****[C-02] Maximum leaving water setpoint in cooling operation****[C-03] Minimum leaving water setpoint in cooling operation**

This depends on field setting [A-04].

**[C-04]**

This setting is not applicable.

**[d] Settings are not applicable****[E] Service mode****[E-00]**

This setting is not applicable.

**[E-01]**

This setting is not applicable.

## 6 Configuration

### [E-02]

This setting is not applicable.

### [E-03]

This setting is not applicable.

### [E-04] Pump only operation (air purge function)

When installing and commissioning the unit it is very important to remove all air from the water circuit.

This field setting operates the pump to improve air removal from the unit without actually operating the unit. The pump will run for 10 minutes, stop 2 minutes, etc.

| [E-04]      | Description                                      |
|-------------|--|
| 0 (default) | Normal operation of the unit                     |
| 1           | Automatic air purge operation during 108 minutes |
| 2           | Automatic air purge operation during 48 minutes  |

### [F] Option setup

#### [F-00] Return water temperature overshoot value

This setting makes it possible to set the allowable overshoot when operating the unit during cooling THERMO ON/OFF condition.

The unit will go in THERMO ON only if the return water temperature (RWT) goes above the setpoint plus the differential temperature:

Thermo ON:  $RWT < \text{Setpoint} + (([F-00]/2) + 1)$

The setting [F-00] has a variability range from 0 to 15 and the step is 1 degree. The default value is 5, meaning that the differential temperature default value is 3.5.

## 6.2 Using the leak detection function

### 6.2.1 About automatic leak detection

The leak detection operation can be automated. By changing parameter [2-85] to chosen value, the interval time or the time till the next automatic leak detection operation can be chosen. The parameter [2-86] defines whether the leak detection operation is executed one time (within [2-85] days) or intermittent, respecting an interval of [2-85] days.

Availability of the leak detection function feature requires input of the additional refrigerant charge amount immediately after finishing the charging. The input must be executed before performing the test operation.

### 6.2.2 To manually perform a leak detection

Executing the leak detection function one time at site can also be done by following procedure.

- 1 Push BS2 one time.
- 2 Push BS2 one more time.
- 3 Push BS2 5 seconds.

Information codes:

Result of leak detection operation is informed in [1-35] and [1-29].

Steps during leak detection:

| Display | Steps                      |
|---------|----------------------------|
| ⌚00     | Preparation <sup>(a)</sup> |
| ⌚01     | Pressure equalisation      |
| ⌚02     | Start up                   |
| ⌚04     | Leak detection operation   |
| ⌚05     | Standby <sup>(b)</sup>     |

| Display | Steps                                |
|---------|--------------------------------------|
| ⌚07     | Leak detection operation is finished |

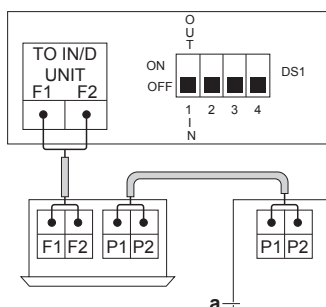
- (a) If the indoor temperature is too low, first the heating operation will start.
- (b) If the indoor temperature is lower than 15°C due to leak detection operation and the outdoor temperature is lower than 20°C, the heating operation will start to maintain basic comfort heating level.

## 6.3 Switching between cooling and heating

Switching the unit between cooling and heating can be done in 2 different ways, depending on how the temperature is controlled, i.e. based on room temperature or based on leaving water temperature.

### Switching between cooling and heating with the user interface

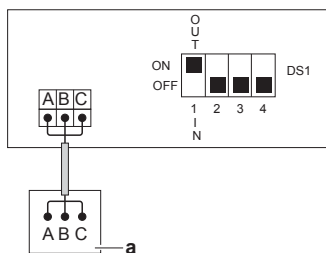
If unit control is based on room temperature (external room thermostat or user interface room thermostat), switching between cooling and heating is done by pushing the cooling/heating button on the user interface.



a User interface

### Switching between cooling and heating with the cool/heat selector

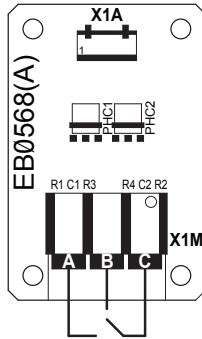
If unit control is based on leaving water temperature, we suggest using the ABC terminals on the outdoor unit. The location of the terminals is shown in the following figure.



a Cool/heat selector

- 1 Press BS5 for 5 seconds to re-initialise communication of the unit.

- Cooling: voltage free contact between terminals A and C is open
- Heating: voltage free contact between terminals A and C is closed



**INFORMATION**

Thermostat input has priority over leaving water temperature setpoint.

It is possible that the leaving water temperature becomes lower than the setpoint if the unit is controlled by room temperature.

## 7 Commissioning

### 7.1 Precautions when commissioning



**DANGER: RISK OF ELECTROCUTION**



**DANGER: RISK OF BURNING**



**CAUTION**

**Do NOT perform the test operation while working on the indoor units.**

When performing the test operation, NOT only the outdoor unit, but the connected indoor unit will operate as well. Working on an indoor unit while performing a test operation is dangerous.



**CAUTION**

Do NOT insert fingers, rods or other objects into the air inlet or outlet. Do NOT remove the fan guard. When the fan is rotating at high speed, it will cause injury.



**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**

Be sure to turn on the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.



**CAUTION**

- Make sure that the circuit breaker on the power supply panel of the installation is switched off.
- Make sure that the power wire is securely attached.
- Make sure there is no missing or wrong N-phase.

### 7.2 Checklist before commissioning the outdoor unit

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.

|                          |  |
|--------------------------|--|
| <input type="checkbox"/> | You read the complete installation and operation instructions, as described in the <b>installer and user reference guide</b> .   |
| <input type="checkbox"/> | <b>Installation</b><br>Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit.   |
| <input type="checkbox"/> | <b>Field wiring</b><br>Be sure that the field wiring has been carried out according to the instructions described in the chapter <a href="#">"5.8 Connecting the electrical wiring"</a> on page 23, according to the wiring diagrams and according to the applicable legislation.  |
| <input type="checkbox"/> | <b>Power supply voltage</b><br>Check the power supply voltage on the local supply panel. The voltage <b>MUST</b> correspond to the voltage on the identification label of the unit.  |
| <input type="checkbox"/> | <b>Earth wiring</b><br>Be sure that the earth wires have been connected properly and that the earth terminals are tightened.   |
| <input type="checkbox"/> | <b>Insulation test of the main power circuit</b><br>Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. <b>NEVER</b> use the megatester for the transmission wiring.   |
| <input type="checkbox"/> | <b>Fuses, circuit breakers, or protection devices</b><br>Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in the chapter <a href="#">"4.4.1 Safety device requirements"</a> on page 11. Be sure that neither a fuse nor a protection device has been bypassed. |
| <input type="checkbox"/> | <b>Internal wiring</b><br>Visually check the electrical component box and the inside of the unit on loose connections or damaged electrical components.  |
| <input type="checkbox"/> | <b>Pipe size and pipe insulation</b><br>Be sure that correct pipe sizes are installed and that the insulation work is properly executed.   |
| <input type="checkbox"/> | <b>Damaged equipment</b><br>Check the inside of the unit on damaged components or squeezed pipes.  |
| <input type="checkbox"/> | <b>Brazing</b><br>Take care not to damage the piping insulation when brazing field piping.   |
| <input type="checkbox"/> | <b>Installation date and field setting</b><br>Be sure to keep record of the installation date on the sticker on the rear of the upper front panel according to EN60335-2-40 and keep record of the contents of the field setting(s).   |
| <input type="checkbox"/> | <b>Switches</b><br>Make sure that switches are set according to your application needs before turning the power supply on.   |



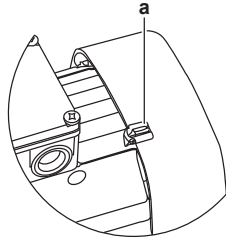
## 7 Commissioning

|                          |  |
|--------------------------|--|
| <input type="checkbox"/> | <b>Power supply wiring and transmission wiring</b><br>Use a designated power supply and transmission wiring and make sure that it has been carried out according to the instructions described in this manual, according to the wiring diagrams and according to local and national regulations. |
| <input type="checkbox"/> | <b>Additional refrigerant charge</b><br>The amount of refrigerant to be added to the unit shall be written on the included "Added refrigerant" plate and attached to the rear side of the front cover.   |
| <input type="checkbox"/> | <b>Airtightness test and vacuum drying</b><br>Make sure the airtightness test and vacuum drying were completed.  |

### 7.3 Checklist before commissioning the indoor unit

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.

|                          |   |
|--------------------------|---|
| <input type="checkbox"/> | You read the complete installation and operation instructions, as described in the <b>installer and user reference guide</b> .  |
| <input type="checkbox"/> | <b>Installation</b><br>Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit.  |
| <input type="checkbox"/> | <b>Field wiring</b><br>Be sure that the field wiring has been carried out according to the instructions described in the chapter <a href="#">"5.8 Connecting the electrical wiring" on page 23</a> , according to the wiring diagrams and according to the applicable legislation.  |
| <input type="checkbox"/> | <b>Power supply voltage</b><br>Check the power supply voltage on the local supply panel. The voltage <b>MUST</b> correspond to the voltage on the identification label of the unit.   |
| <input type="checkbox"/> | <b>Earth wiring</b><br>Be sure that the earth wires have been connected properly and that the earth terminals are tightened.  |
| <input type="checkbox"/> | <b>Insulation test of the main power circuit</b><br>Using a megatester for 500 V, check that the insulation resistance of 2 MΩ or more is attained by applying a voltage of 500 V DC between power terminals and earth. <b>NEVER</b> use the megatester for the transmission wiring.  |
| <input type="checkbox"/> | <b>Fuses, circuit breakers, or protection devices</b><br>Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in the chapter <a href="#">"4.4.1 Safety device requirements" on page 11</a> . Be sure that neither a fuse nor a protection device has been bypassed. |
| <input type="checkbox"/> | <b>Internal wiring</b><br>Visually check the electrical component box and the inside of the unit on loose connections or damaged electrical components.   |

|                          |  |
|--------------------------|--|
| <input type="checkbox"/> | <b>Pump rotation direction</b><br>If the 3-phase power input to the indoor unit is not correctly wired (X1M), the pump may rotate in the wrong direction. When this happens, the pump may slowly overheat due to reduced air flow, fan ventilation may be reduced and the motor may consume more power. The indicator on the pump motor fan cover indicates the direction of rotation of the pump. Check operation of this indicator before starting the unit for the first time or when the position of the indicator has changed. If the indicator is in the white/reflecting field, switch off the power supply and switch any two of the incoming supply wires at X1M. The correct direction of rotation is also shown by arrows on the pump motor fan cover.<br><br>a = pump rotation direction indicator |
| <input type="checkbox"/> | <b>Pipe size and pipe insulation</b><br>Be sure that correct pipe sizes are installed and that the insulation work is properly executed.   |
| <input type="checkbox"/> | The <b>air purge</b> valve is open (at least 2 turns).   |
| <input type="checkbox"/> | <b>Shut-off valves</b><br>Be sure that the shut-off valves are correctly installed and fully open.   |
| <input type="checkbox"/> | <b>Filter</b><br>Make sure that the filter is installed correctly.   |
| <input type="checkbox"/> | <b>Damaged equipment</b><br>Check the inside of the unit on damaged components or squeezed pipes.  |
| <input type="checkbox"/> | <b>Brazing</b><br>Take care not to damage the piping insulation when brazing field piping.   |
| <input type="checkbox"/> | <b>Water leak</b><br>Check the inside of the unit for water leakage. If there is a water leak, try to repair the leak. If the repair is unsuccessful, close the water inlet and outlet shut-off valves and call your local dealer.   |
| <input type="checkbox"/> | <b>Installation date and field setting</b><br>Be sure to keep record of the installation date on the sticker on the rear of the upper front panel according to EN60335-2-40 and keep record of the contents of the field setting(s).   |
| <input type="checkbox"/> | <b>Schedule timer form</b><br>Fill out the form at the very end of this document. When programming the schedule timer, this form can help you define the required actions for each day.  |



#### NOTICE

Operating the system with closed valves will damage the pump.

Once all checks are fulfilled, the unit must be closed, only then can the unit be powered up. When the power supply to the unit is turned on, "88" is displayed on the user interface during its initialization, which may take up to 30 seconds. During this process, the user interface cannot be operated.

## 7.4 Final check

Before switching on the unit, read the following recommendations:

- When the complete installation and all necessary settings have been carried out, be sure that all panels of the unit are closed. If this is not the case, inserting your hand through the remaining openings can cause serious injury due to electrical and hot parts inside the unit.
- The service panel of the electrical component box may only be opened by a licensed electrician for maintenance purposes.



### DANGER: RISK OF ELECTROCUTION

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



### 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 48 hours before reaching smooth operation and stable power consumption.

## 7.5 To perform a test run of the outdoor unit



### CAUTION

Do NOT insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.



### CAUTION

**Do NOT perform the test operation while working on the indoor units.**

When performing the test operation, NOT only the outdoor unit, but the connected indoor unit will operate as well. Working on an indoor unit while performing a test operation is dangerous.

### 7.5.1 Refrigerant added using automatic charging

The test run will first run the following checks:

- Are the stop valves open?
- Is the wiring correct?
- Piping length
- Initial refrigerant state

This checking operation takes  $\pm 3$  hours ( $\pm 4$  hours in low outdoor temperature) to complete.

The system cannot check the initial refrigerant state if the outdoor or indoor temperature is out of range (outdoor temperature: 0~43°C DB, indoor temperature: 20~32°C DB) or if the unit is forced OFF during the test run. In this case, after performing the check operation, normal operation is possible although error code *U3* is displayed on the indoor unit user interface and the refrigerant leak detection function cannot be used. Perform the check operation again and complete the judgement of initial refrigerant state.

Perform the test run procedure.

### 7.5.2 Refrigerant added using manual charging (cooling mode)

The test run will first run the following checks:

- Are the stop valves open?
- Is the wiring correct?

- Piping length

This checking operation takes  $\pm 30$  minutes to complete.

#### Check operation procedure

- Close the electrical component box lid and all front panels except the one on the side of the electrical component box.
- Turn on the power to the outdoor unit and all connected indoor units. Be sure to turn the power ON at least 6 hours before operation in order to have power running to the crankcase heater.
- Press BS1 on the outdoor unit PCB for 5 seconds. The H1P LED lights up.
- Press BS2 until the H6P and H7P LEDs light up.  
**Result:** The system operates for  $\pm 30$  minutes, after which the check operation automatically stops.
- If no malfunction code is displayed on the user interface after the system has stopped, check if the operation is completed. Normal operation will be possible after 5 minutes.
- If an error code is displayed on the user interface, refer to "7.6 Correcting after abnormal completion of the test run" on page 38.

### 7.5.3 Refrigerant added using manual charging (heating mode, pre-charging)

The test run will first run the following checks:

- Are the stop valves open?
- Is the wiring correct?
- Was too much refrigerant charged?
- Piping length

This checking operation takes  $\pm 40$  minutes to complete. Perform the test run procedure.

#### Test run procedure

- Close all front panels except the one on the side of the electrical component box.
- Turn on the power to the outdoor unit and all connected indoor units. Be sure to turn the power ON at least 6 hours before operation in order to have power running to the crankcase heater.
- Press BS1 on the outdoor unit PCB once. The H1P LED will be off.
- Press BS4 for at least 5 seconds.  
**Result:** The test run is automatically carried out in cooling mode, the H2P LED will light up, and the messages "Test operation" and "Under centralized control" will be displayed on the user interface. It may take 10 minutes to bring the refrigerant in a uniform state before the compressor starts. During the test operation, the refrigerant running sound or the magnetic sound of a solenoid valve may become loud and the LED display may change, but these are not malfunctions. It is not possible to stop operation using a user interface during the test operation. To abort the operation, press BS3, and the unit will stop after  $\pm 30$  seconds.
- Close the front panel in order not to let it be the cause of misjudgement.
- If the test operation has completed successfully (only H3P LED lit), normal operation will be possible after 5 minutes. Otherwise, refer to "7.6 Correcting after abnormal completion of the test run" on page 38.

## 8 Troubleshooting

### 7.6 Correcting after abnormal completion of the test run

The test operation is only completed if there is no malfunction code displayed on the user interface or the H2P LED is not lit.

| Main code            | Cause   | Solution  |
|----------------------|---|---|
| E3<br>E4<br>F3<br>UF | The stop valve of the outdoor unit is left closed.  | Open the stop valve on both the gas and liquid side.  |
| E3<br>F6<br>UF       | Refrigerant overcharge.   | Recalculate the required amount of refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine. |
| E4<br>F3             | Insufficient refrigerant.   | Check if the additional refrigerant charge has been finished correctly. Recalculate the required amount of refrigerant from the piping length and add an adequate amount of refrigerant.    |
| U1                   | Reversed power supply phase malfunction.  | Correct phase order.  |
| U1<br>U4             | No power is supplied to the outdoor unit.   | Check if the power wiring for the outdoor unit is connected correctly.  |
| UF                   | The piping and wiring of the specified indoor unit are not connected correctly to the outdoor unit. | Confirm that the piping and wiring of the specified indoor unit are connected correctly to the outdoor unit.  |

After correcting the abnormality, press BS3 and reset the error code.

Carry out the test operation again and confirm that the abnormality is properly corrected.

## 8 Troubleshooting

### 8.1 Error codes: Overview

| Main code | Cause  | Solution   |
|-----------|--|--|
| R1        | Failure writing memory (EEPROM error)              | Contact your local dealer.   |
| RE        | Water circuit malfunction                          | <ul style="list-style-type: none"> <li>▪ Check that water flow is possible (open all valves in the circuit).</li> <li>▪ Force clean water through the unit.</li> </ul>   |
| R9        | R410A expansion valve error (K11E/K12E)            | <ul style="list-style-type: none"> <li>▪ Check wiring connections.</li> <li>▪ Contact your local dealer.</li> </ul>  |
| RE        | Water system warning                               | <ul style="list-style-type: none"> <li>▪ Check filter.</li> <li>▪ Make sure all valves are open.</li> <li>▪ Contact your local dealer.</li> </ul>  |
| RJ        | Capacity error                                     | Contact your local dealer.   |
| E1        | Bad ACS communication                              | Contact your local dealer.   |
| E4        | R410A liquid thermistor error (R13T/R23T)          | <ul style="list-style-type: none"> <li>▪ Check wiring connections.</li> <li>▪ Contact your local dealer.</li> </ul>  |
| E9        | Returning water thermistor error (R12T/R22T)       | <ul style="list-style-type: none"> <li>▪ Check wiring connections.</li> <li>▪ Contact your local dealer.</li> </ul>  |
| ER        | Heating leaving water thermistor error (R11T/R12T) | <ul style="list-style-type: none"> <li>▪ Check wiring connections.</li> <li>▪ Contact your local dealer.</li> </ul>  |
| EJ        | User interface thermostat thermistor error         | Contact your local dealer.   |
| E3        | High pressure error (SENP/S1PH)                    | <ul style="list-style-type: none"> <li>▪ Check that the circuit does not contain any air.</li> <li>▪ Check that water flow is possible (open all valves in the circuit).</li> <li>▪ Check that the water filter is not blocked.</li> <li>▪ Check that all refrigerant stop valves are open.</li> <li>▪ Contact your local dealer.</li> </ul> |
| E4        | Low pressure error (SENP/L)                        | Contact your local dealer.   |

| Main code | Cause   | Solution   |
|-----------|---|--|
| <i>J7</i> | R410A suction thermistor error (R14T/R24T)                              | <ul style="list-style-type: none"> <li>Check wiring connections.</li> <li>Contact your local dealer.</li> </ul>  |
| <i>U1</i> | Reversed power supply phase malfunction                                 | Correct phase order.   |
| <i>U2</i> | Insufficient supply voltage   | <ul style="list-style-type: none"> <li>Check wiring connections.</li> <li>Contact your local dealer.</li> </ul>  |
| <i>UB</i> | Two main user interfaces are connected (when using two user interfaces) | Check that SS1 of one controller is set to MAIN, and the other one to SUB. Turn the power supply off, and then back on.  |
| <i>UR</i> | Type connection problem   | <ul style="list-style-type: none"> <li>Wait until initialization between the indoor unit and outdoor unit is completed (wait at least 12 minutes after power ON).</li> <li>Contact your local dealer.</li> </ul> |
| <i>UH</i> | Address error   | Contact your local dealer.   |

### 8.1.1 Error codes of the outdoor unit

#### Heating mode error codes

| Error code                      | Solution  |
|---------------------------------|---|
| <i>PB</i><br>recharge operation | Close valve A immediately and press the TEST OPERATION button once. The operation will restart from the charging mode judgement onwards.  |
| <i>P2</i><br>charging aborted   | <ul style="list-style-type: none"> <li>Close valve A immediately. Check following items:                             <ul style="list-style-type: none"> <li>Is the gas side stop valve opened correctly?</li> <li>Is the valve of the refrigerant tank open?</li> <li>Are the air inlet and outlet of the indoor unit obstructed?</li> </ul> </li> <li>Correct the abnormality and restart the automatic charging procedure.</li> </ul> |

#### Cooling mode error codes

| Error code                                    | Solution  |
|---|---|
| <i>PR, PH, PC</i><br>replace refrigerant tank | <ul style="list-style-type: none"> <li>Close valve A and replace the empty refrigerant tank. When replaced, open valve A (the outdoor unit will not stop operating).</li> <li>The code on the display shows the unit where a cylinder is to be renewed: <i>PR</i> = master unit, <i>PH</i> = slave unit 1, <i>PC</i> = slave unit 2, flashing <i>PR, PH</i> and <i>PC</i> = all units</li> </ul>  |
| <i>PB</i><br>recharge operation               | Close valve A immediately. Restart the automatic charging procedure.  |
| <i>P2</i><br>charging aborted                 | <ul style="list-style-type: none"> <li>Close valve A immediately. Check following items:                             <ul style="list-style-type: none"> <li>Is the gas side stop valve opened correctly?</li> <li>Is the valve of the refrigerant tank open?</li> <li>Are the air inlet and outlet of the indoor unit obstructed?</li> </ul> </li> <li>Correct the abnormality and restart the automatic charging procedure.</li> </ul> |
| *<br>abnormal stop                            | Close valve A immediately. Confirm the malfunction code on the user interface and correct the abnormality by following the information "7.6 Correcting after abnormal completion of the test run" on page 38.   |

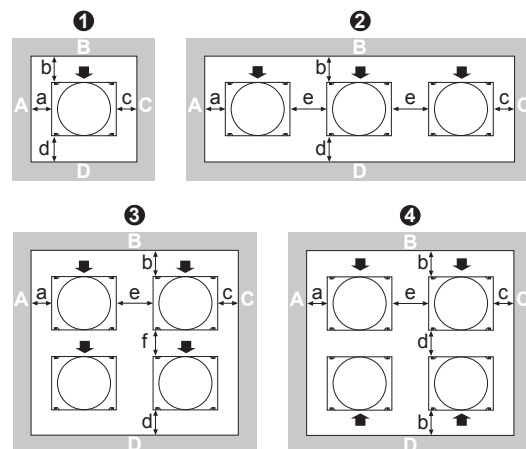
## 9 Technical data

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

### 9.1 Service space: Outdoor unit

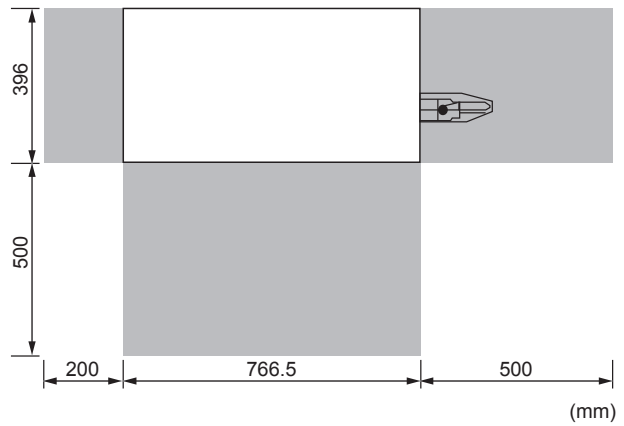
Make sure the space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available (refer to the figure below and choose one of the possibilities).

- In case of an installation site where sides A+B+C+D have obstacles, the wall heights of sides A+C have no impact on service space dimensions. Refer to the figure for impact of wall heights of sides B+D on service space dimensions.
- In case of an installation site where only sides A+B have obstacles, the wall heights have no influence on any indicated service space dimensions.



## 9 Technical data

| Layout | A+B+C+D   |  | A+B                              |
|--------|---|--|----------------------------------|
|        | Possibility 1   | Possibility 2  |                                  |
| 1      | a≥10 mm<br>b≥300 mm<br>c≥10 mm<br>d≥500 mm                        | a≥50 mm<br>b≥100 mm<br>c≥50 mm<br>d≥500 mm                         | a≥200 mm<br>b≥300 mm             |
| 2      | a≥10 mm<br>b≥300 mm<br>c≥10 mm<br>d≥500 mm<br>e≥20 mm             | a≥50 mm<br>b≥100 mm<br>c≥50 mm<br>d≥500 mm<br>e≥100 mm             | a≥200 mm<br>b≥300 mm<br>e≥400 mm |
| 3      | a≥10 mm<br>b≥300 mm<br>c≥10 mm<br>d≥500 mm<br>e≥20 mm<br>f≥600 mm | a≥50 mm<br>b≥100 mm<br>c≥50 mm<br>d≥500 mm<br>e≥100 mm<br>f≥500 mm | —                                |
| 4      | a≥10 mm<br>b≥300 mm<br>c≥10 mm<br>d≥500 mm<br>e≥20 mm             | a≥50 mm<br>b≥100 mm<br>c≥50 mm<br>d≥500 mm<br>e≥100 mm             |                                  |



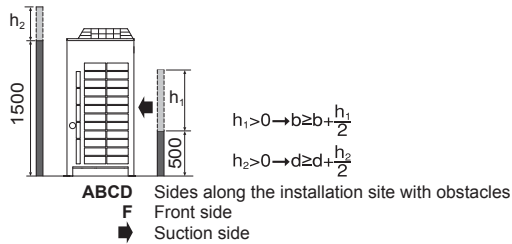
### CAUTION

Make sure the right service panel can still be removed after installation of the piping.



### INFORMATION

Further specifications can be found in the technical engineering data.



### INFORMATION

The service space dimensions in above figure are based on cooling operation at 35°C ambient temperature (standard conditions).



### INFORMATION

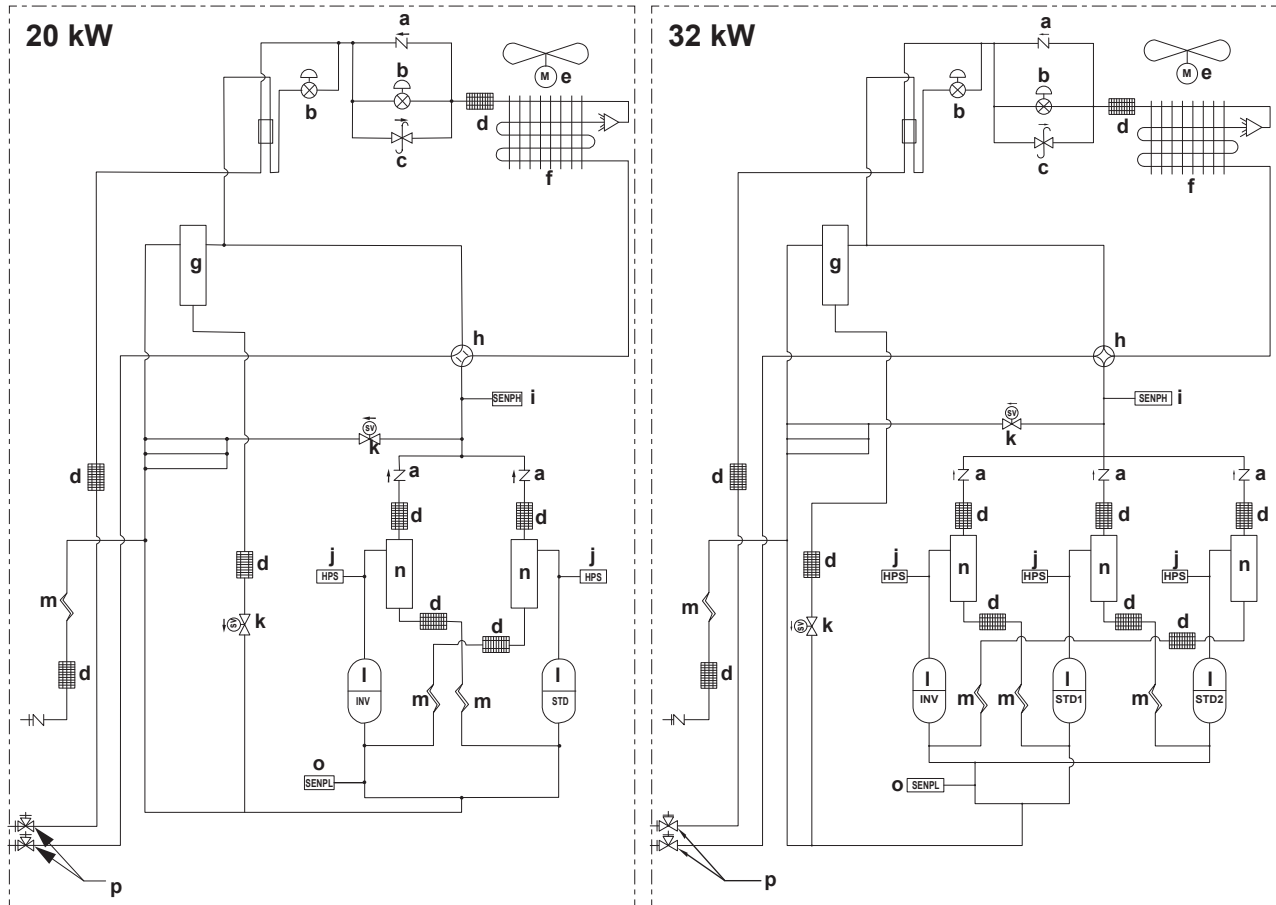
Further specifications can be found in the technical engineering data.

## 9.2 Service space: Indoor unit

Make sure the space around the unit is adequate for servicing (refer to the figure below).



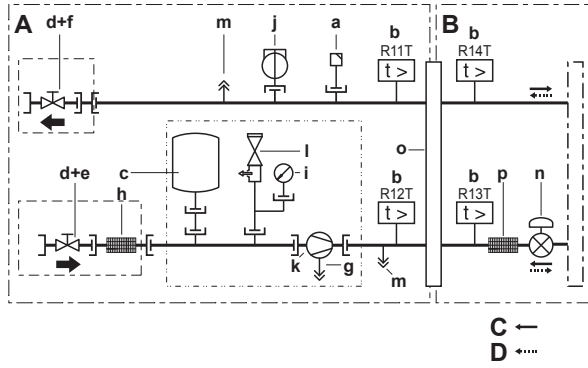
9.3 Piping diagram: Outdoor unit



- a Check valve
- b Electronic expansion valve
- c Pressure regulating valve
- d Filter
- e Fan
- f Heat exchanger
- g Accumulator
- h 4-way valve
- i High pressure sensor
- j High pressure switch
- k Solenoid valve
- l Compressor
- m Capillary tube
- n Oil separator
- o Low pressure sensor
- p Stop valve (with service port on on-site piping side 7.9 mm flare connection)

## 9 Technical data

### 9.4 Piping diagram: Indoor unit



- a Air purge valve
- b Temperature sensors (R11T, R12T, R13T, R14T)
- c Expansion vessel (12 l)
- d Shut-off valve (field installed)
- e Water inlet connection
- f Water outlet connection
- g Drain port
- h Water filter
- i Pressure gauge
- j Flow switch
- k Pump
- l Safety valve
- m Check valve
- n Electronic expansion valve
- o Heat exchanger
- p Filter
- A Water side
- B Refrigerant side
- C Refrigerant flow in cooling mode
- D Refrigerant flow in heating mode

## 9.5 Wiring diagram: Outdoor unit

Refer to the wiring diagram sticker on the outdoor unit. The abbreviations used are listed below:



### INFORMATION

The wiring diagram on the outdoor unit is only for the outdoor unit. For the indoor unit or optional electrical components, refer to the wiring diagram of the indoor unit.

|          |                          |
|----------|--------------------------|
| L1,L2,L3 | Live                     |
| N        | Neutral                  |
| ⋮        | Field wiring             |
| □□□□     | Terminal strip           |
| ⊞        | Connector                |
| ⊖        | Terminal                 |
|          | Protective earth (screw) |
| BLK      | Black                    |
| BLU      | Blue                     |
| BRN      | Brown                    |
| GRN      | Green                    |
| GRY      | Grey                     |
| ORG      | Orange                   |
| PNK      | Pink                     |
| RED      | Red                      |
| WHT      | White                    |
| YLW      | Yellow                   |

|              |  |
|--------------|--|
| A1P~A7P      | Printed circuit board                              |
| BS1~BS5      | Pushbutton switch (mode, set, return, test, reset) |
| C1, C63, C66 | Capacitor  |
| DS1, DS2     | DIP switch   |
| E1HC~E3HC    | Crankcase heater                                   |
| F1U          | Fuse (650 V, 8 A, B) (A4P) (A8P)                   |
| F1U, F2U     | Fuse (250 V, 3.15 A, T) (A1P)                      |
| F5U          | Field fuse   |
| F400U        | Fuse (250 V, 6.3 A, T) (A2P)                       |
| H1P~H8P      | Pilot lamp (service monitor - orange)              |
|              | H2P blinks: under preparation or in test operation |
|              | H2P lights up: malfunction detection               |
| HAP          | Pilot lamp (service monitor - green)               |
| K1           | Magnetic relay                                     |
| K2           | Magnetic contactor (M1C)                           |
| K2M, K3M     | Magnetic contactor (M2C, M3C)                      |
| K1R, K2R     | Magnetic relay (K2M, K3M)                          |
| K3R~K5R      | Magnetic relay (Y1S~Y3S)                           |
| K6R~K9R      | Magnetic relay (E1HC~E3HC)                         |
| L1R          | Reactor  |
| M1C ~M3C     | Motor (compressor)                                 |
| M1F, M2F     | Motor (fan)  |
| PS           | Switching power supply (A1P, A3P)                  |
| Q1DI         | Earth leakage circuit breaker (field supply)       |
| Q1RP         | Phase reversal detection circuit                   |
| R1T          | Thermistor (fin) (A2P)                             |
| R1T          | Thermistor (air) (A1P)                             |

|            |  |
|------------|--|
| R2T        | Thermistor (suction)   |
| R4T        | Thermistor (coil-deicer)                                       |
| R5T        | Thermistor (coil-outlet)                                       |
| R6T        | Thermistor (liquid-pipe receiver)                              |
| R7T        | Thermistor (accumulator)                                       |
| R10        | Resistor (current sensor) (A4P) (A8P)                          |
| R31T~R33T  | Thermistor (discharge) (M1C ~M3C)                              |
| R50, R59   | Resistor   |
| R95        | Resistor (current limiting)                                    |
| S1NPH      | Pressure sensor (high)   |
| S1NPL      | Pressure sensor (low)  |
| S1PH, S3PH | Pressure switch (high)   |
| S1S        | Selector switch (fan, cool/heat) (optional cool/heat selector) |
| S2S        | Selector switch (cool/heat) (optional cool/heat selector)      |
| SD1        | Safety devices input   |
| T1A        | Current sensor (A6P, A7P)                                      |
| V1R        | Power module (A4P, A8P)  |
| V1R, V2R   | Power module (A3P)   |
| X1A, X4A   | Connector (M1F, M2F)   |
| X1M        | Terminal strip (power supply)                                  |
| X1M        | Terminal strip (control) (A1P)                                 |
| X1M        | Terminal strip (A5P)   |
| Y1E, Y2E   | Expansion valve (electronic type) (main, subcool)              |
| Y1S        | Solenoid valve (hotgas bypass)                                 |
| Y2S        | Solenoid valve (oil return)                                    |
| Y3S        | Solenoid valve (4-way valve)                                   |
| Y4S        | Solenoid valve (injection)                                     |
| Z1C~Z7C    | Noise filter (ferrite core)                                    |
| Z1F        | Noise filter (with surge absorber)                             |

## 10 About the system

### 9.6 Wiring diagram: Indoor unit

Refer to the wiring diagram sticker on the indoor unit. The abbreviations used are listed below:

|           |                          |
|-----------|--------------------------|
| L1,L2,L3  | Live                     |
| N         | Neutral                  |
| ⋮ ■ ■ ■ ⋮ | Field wiring             |
| □ □ □ □   | Terminal strip           |
| ⊞         | Connector                |
| ○         | Terminal                 |
| ⊕         | Protective earth (screw) |
| BLK       | Black                    |
| BLU       | Blue                     |
| BRN       | Brown                    |
| GRN       | Green                    |
| GRY       | Grey                     |
| ORG       | Orange                   |
| PNK       | Pink                     |
| RED       | Red                      |
| WHT       | White                    |
| YLW       | Yellow                   |

|           |                                      |
|-----------|--------------------------------------|
| A1P       | Main PCB circuit 1                   |
| A2P       | User interface PCB                   |
| A3P       | Control PCB circuit 1                |
| A4P       | Demand PCB (optional)                |
| A5P       | Main PCB circuit 2                   |
| A6P       | Demand PCB (optional)                |
| A7P       | Remote user interface PCB (optional) |
| A8P       | Control PCB circuit 2                |
| C1~C3     | Filter capacitor                     |
| F1U (A*P) | Fuse (250 V, 3.15 A, T)              |
| HAP (A*P) | PCB LED                              |

|                |  |
|----------------|--|
| K11E           | Electronic expansion valve (circuit 1)       |
| K21E           | Electronic expansion valve (circuit 2)       |
| K1P            | Pump contactor                               |
| K1S            | Pump overcurrent relay                       |
| K*R (A3P)      | PCB relay                                    |
| M1P            | Pump   |
| Q1T            | Thermostat for expansion vessel heater       |
| PS (A*P)       | Switching power supply                       |
| Q1DI           | Earth leakage circuit breaker (field supply) |
| R1T            | Thermistor (air, fin)                        |
| R11T           | Leaving water thermistor (circuit 1)         |
| R12T           | Returning water thermistor (circuit 1)       |
| R13T           | Refrigerant liquid thermistor (circuit 1)    |
| R14T           | Refrigerant gas thermistor (circuit 1)       |
| R21T           | Leaving water thermistor (circuit 2)         |
| R22T           | Returning water thermistor (circuit 2)       |
| R23T           | Refrigerant liquid thermistor (circuit 2)    |
| R24T           | Refrigerant gas thermistor (circuit 2)       |
| S1L            | Flow switch (circuit 1)                      |
| S2L            | Flow switch (circuit 2)                      |
| S1S            | Thermostat input 1 (field supply)            |
| S2S            | Thermostat input 2 (field supply)            |
| S3S            | Operation ON input (field supply)            |
| S4S            | Operation OFF input (field supply)           |
| SS1 (A1P, A5P) | Selector switch (emergency)                  |
| SS1 (A2P)      | Selector switch (master/slave)               |
| SS1 (A7P)      | Selector switch (master/slave) (optional)    |
| V1C, V2C       | Ferrite core noise filter                    |
| X1M~X4M        | Terminal strip                               |
| X801M (A*P)    | Printed circuit board terminal strip         |
| Z1F, Z2F (A*P) | Noise filter                                 |

## For the user

### 10 About the system



#### NOTICE

Do not use the system for other purposes. In order to avoid any quality deterioration, do not use the unit for cooling precision instruments or works of art.

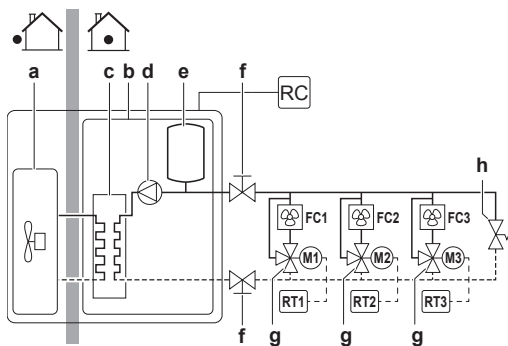


#### NOTICE

For future modifications or expansions of your system:

A full overview of allowable combinations (for future system extensions) is available in technical engineering data and should be consulted. Contact your installer to receive more information and professional advice.

### 10.1 System layout



- a Outdoor unit
- b Indoor unit
- c Plate heat exchanger
- d Pump
- e Expansion vessel
- f Shut-off valve
- g Motorized valve

- h Bypass valve
- FC1...3 Fancoil unit (field supply)
- RC User interface
- RT1...3 Room thermostat

- a Operation lamp
- b ON/OFF button

## 11 User interface



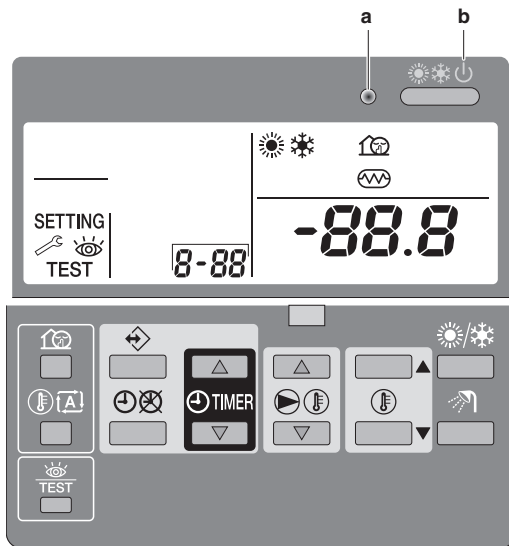
### CAUTION

- NEVER touch the internal parts of the controller.
- Do NOT remove the front panel. Some parts inside are dangerous to touch and appliance problems may happen. For checking and adjusting the internal parts, contact your dealer.

This operation manual will give a non-exhaustive overview of the main functions of the system.

Refer to the operation manual of the user interface for information about the display and the buttons of the user interface.

### User interface



## 12 Operation

### 12.1 Operation range

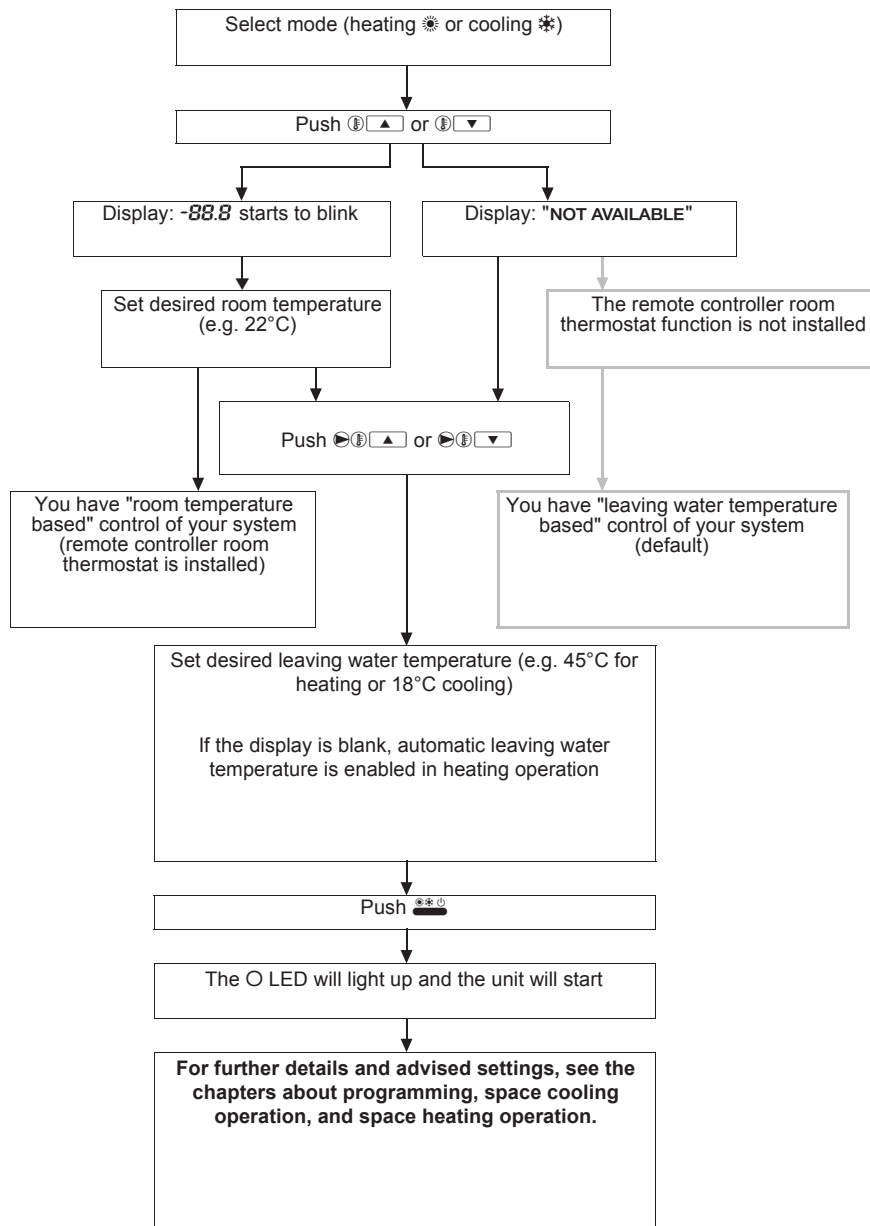
Use the system in the following temperature ranges for safe and effective operation.

|              | Cooling    | Heating     |
|--------------|------------|-------------|
| Outdoor unit | -5~43°C DB | -15~35°C DB |
| Indoor unit  | 5~20°C DB  | 25~50°C DB  |

### 12.2 Quick start-up

The flow chart shows the steps required for starting up space cooling/heating and allows the user to start up the system before reading the entire manual.

See "12.3 Operating the system" on page 46 for more detailed information.



## 12.3 Operating the system

### 12.3.1 About the clock

#### **i** INFORMATION

- The clock must be set manually. Adjust the setting when switching from summertime to wintertime and vice versa.
- The clock cannot be adjusted if the controller is set to permission level 2 or 3 (see field setting [0-00] in "6.1.9 Field settings on the user interface" on page 29).
- A power failure of more than 2 hours will reset the clock and the day of the week. The schedule timer will continue operation, but with a disordered clock. Correct the clock and the day of the week.

### To set the clock

- 1 Hold down the ⏪/⏩ button for 5 seconds.  
**Result:** The clock read-out and the day of week indicator start flashing.
- 2 Press the ⏪/▲ or ⏩/▼ button to increase/decrease the time by 1 minute. Keep the button pressed to increase/decrease the time by 10 minutes.
- 3 Press the ⏪/▲ or ⏩/▼ button to display the previous or next day of the week.
- 4 Press the ⏪ button to confirm the current set time and day of the week.
- 5 Press the ⏪/⏩ button to cancel this procedure without saving.  
**Result:** If no button is pressed for 5 minutes, the clock and day of the week will return to their previous setting.



### 12.3.2 About operating the system

If the main power supply is turned off during operation, operation will restart automatically after the power turns back on again.

### 12.3.3 Space cooling operation

Space cooling can be controlled in 2 different ways:

- based on room temperature
- based on leaving water temperature (default)

#### To switch space cooling on/off using room temperature control

In this mode, cooling will be activated as required by the room temperature setpoint. The setpoint can be set manually or through the schedule timer.



#### INFORMATION

- When using room temperature control, space cooling operation based on room temperature will have priority over leaving water control.
- It is possible that the leaving water temperature becomes higher than the setpoint if the unit is controlled by room temperature.

- 1 Press **☼** to switch space cooling (☼) on/off.

**Result:** ☼ and the corresponding actual room temperature setpoint appear on the display. The operation LED **O** lights up.

- 2 Set the desired room temperature using **⏪** and **⏩**. For setup of the schedule timer function, see "[12.3.6 Schedule timer](#)" on page 48.



#### INFORMATION

Temperature range for cooling: 16°C~32°C (room temperature)

- 3 Select the leaving water temperature which you want to be used to cool down your system using **⏪** and **⏩**. For detailed information, see "[To switch space cooling on/off using leaving water temperature control](#)" on page 47.

#### To switch space cooling on/off using leaving water temperature control

In this mode, cooling will be activated as required by the water temperature setpoint. The setpoint can be set manually or through the schedule timer.

- 1 Press **☼** to switch space cooling (☼) on/off.

**Result:** ☼ and the corresponding actual room temperature setpoint appear on the display. The operation LED **O** lights up.

- 2 Set the desired leaving water temperature using **⏪** and **⏩**.



#### INFORMATION

Temperature range for cooling: 5°C~20°C (leaving water temperature).

For setup of the schedule timer function, see "[To program space cooling](#)" on page 50, "[To program space heating](#)" on page 50, and "[To program quiet mode](#)" on page 51.



#### INFORMATION

- When an external room thermostat is installed, the thermo ON/OFF is determined by the external room thermostat. The remote controller is then operated in the leaving water control mode and is not functioning as a room thermostat.
- The remote controller ON/OFF status always has priority over the external room thermostat!



#### INFORMATION

Setback operation and weather dependent setpoint are not available in the cooling mode.

### 12.3.4 Space heating operation

Space heating is available for heat pump units only.

Space heating can be controlled in 2 different ways:

- based on room temperature
- based on leaving water temperature (default)

#### To switch space heating on/off using room temperature control

##### Room temperature control

In this mode, heating will be activated as required by the room temperature setpoint. The setpoint can be set manually or through the schedule timer.



#### INFORMATION

- When using room temperature control, space heating operation based on room temperature will have priority over leaving water control.
- It is possible that the leaving water temperature becomes higher than the setpoint if the unit is controlled by room temperature.

- 1 Press **☼** to switch space heating (☼) on/off.

**Result:** ☼ and the corresponding actual room temperature setpoint appear on the display. The operation LED **O** lights up.

- 2 Set the desired room temperature using **⏪** and **⏩**. In order to avoid overheating, space heating cannot be used when the outdoor ambient temperature rises above a certain temperature (see "[12.1 Operation range](#)" on page 45). For setup of the schedule timer function, see "[12.3.6 Schedule timer](#)" on page 48.



#### INFORMATION

Temperature range for heating: 16°C~32°C (room temperature)

- 3 Select the leaving water temperature which you want to be used to heat up your system using **⏪** and **⏩**. For detailed information, see "[To switch space heating on/off using leaving water temperature control](#)" on page 48.

#### Automatic setback function

For the automatic setback function settings, see field setting [2] in "[6.1.9 Field settings on the user interface](#)" on page 29.



#### INFORMATION

- **⏪** flashes during setback operation.
- While room temperature setback function is active, leaving water setback operation is also performed (see "[To switch space cooling on/off using leaving water temperature control](#)" on page 47).
- Do not to set the setback value too low, especially during colder periods (e.g. winter time). It is possible that the room temperature cannot be reached (or it will take much longer) because of the big temperature difference.

The setback function provides the possibility to lower the room temperature. It can be activated e.g. during the night, because temperature demands during night and day are not the same.

## 12 Operation

### To switch space heating on/off using leaving water temperature control

In this mode, heating will be activated as required by the water temperature setpoint. The setpoint can be set manually or through the schedule timer.

- 1 Press **ON/OFF** to switch space heating (🔥) on/off.  
**Result:** 🔥 and the corresponding actual room temperature setpoint appear on the display. The operation LED **ON** lights up.
- 2 Set the desired leaving water temperature using **TEMP UP** and **TEMP DOWN**. In order to avoid overheating, space heating cannot be used when the outdoor ambient temperature rises above a certain temperature (see "12.1 Operation range" on page 45).

#### **i** INFORMATION

Temperature range for heating: 25°C~50°C (leaving water temperature)

For setup of the schedule timer function, see "12.3.6 Schedule timer" on page 48.

#### **i** INFORMATION

- When an external room thermostat is installed, the thermo ON/OFF is determined by the external room thermostat. The remote controller is then operated in the leaving water control mode and is not functioning as a room thermostat.
- The remote controller ON/OFF status always has priority over the external room thermostat!

#### **i** INFORMATION

During this operation, instead of showing the water temperature setpoint, the controller shows the shift value which can be set by the user.

#### Automatic setback function

For the automatic setback function settings, see field setting [2] in "6.1.9 Field settings on the user interface" on page 29.

### 12.3.5 Other operation modes

#### Start up operation

During start up, **START** on the display means that the heat pump is still starting up.

#### Defrost operation (🔥)

#### **i** INFORMATION

This function is available for heat pump units ONLY.

In space heating operation, freezing of the outdoor heat exchanger may occur due to low outdoor temperature. If this risk occurs, the system goes into defrost operation. It reverses the cycle and takes heat from the water system to prevent freezing of the outdoor system. After a maximum of 15 minutes of defrost operation, the system returns to space heating operation. Space heating operation is not possible during defrost operation.

#### Quiet mode operation (🔇)

Quiet mode operation means that the unit works at reduced compressor speed so that the noise produced by the unit drops. This implies that it will take longer until the required temperature setpoint is reached. Beware of this when a certain level of heating is required indoors.

There are 3 different levels of quiet mode operation. The desired quiet mode is set through a field setting.

- 1 Press **🔇** to activate quiet mode operation.  
**Result:** **🔇** appears on the display. If the controller is set to permission level 2 or 3 (see "6.1 Making field settings" on page 26), the **🔇** button cannot be used.

- 2 Press **🔇** again to deactivate quiet mode operation.

**Result:** **🔇** disappears from the display.

The actual temperatures can be displayed on the remote controller.

- 3 Press **TEMP** for 5 seconds.

**Result:** The leaving water temperature is displayed (🔥, 🌡️, and 🔇 blink).

- 4 Press **TEMP UP** and **TEMP DOWN** to display:

- The entering water temperature (🔥 and 🌡️ blink, and 🔇 flashes slowly).
- The indoor temperature (🔥 and 🌡️ blink).
- The outdoor temperature (🔥 and 🌡️ blink).

- 5 Press **TEMP** again to leave this mode. If no button is pressed, the remote controller leaves the display mode after 10 seconds.

### 12.3.6 Schedule timer

Press **🕒** to enable or disable the schedule timer (🕒).

Four actions per day can be programmed, making a total of 28 actions per week.

The schedule timer can be programmed in 2 different ways:

- based on the temperature setpoint (leaving water temperature and room temperature)
- based on the ON/OFF instruction.

The programming method is set in the field settings. See "6.1 Making field settings" on page 26. Before programming, fill out the form at the very end of this document. This form can help you define the required actions for each day.

#### **i** INFORMATION

- When power is restored after a power failure, the auto restart function reapplies the remote controller settings at the time of the power failure (if the power was interrupted for less than 2 hours). It is therefore recommended to leave the auto restart function enabled.
- As the programmed schedule is time driven, it is essential to set the clock and the day of the week correctly. See "12.3.1 About the clock" on page 46.
- Schedule timer actions will only be executed when the schedule timer is enabled (🕒 visible on the display)!
- The programmed actions are not stored according to their time of execution, but according to the time of programming, i.e. action number 1 is the action that was programmed first, even though it may be executed after other programmed action numbers.
- If 2 or more actions are programmed for the same day and at the same time, only the action with the lowest action number will be executed.

#### **⚠️** CAUTION

For use of units in applications with schedule timer mode, it is advised to foresee a delay of 10 to 15 minutes for signalling the alarm in case the schedule timer is exceeded. The unit may stop for several minutes during normal operation for "defrosting of the unit" or when in "thermostat-stop" operation.

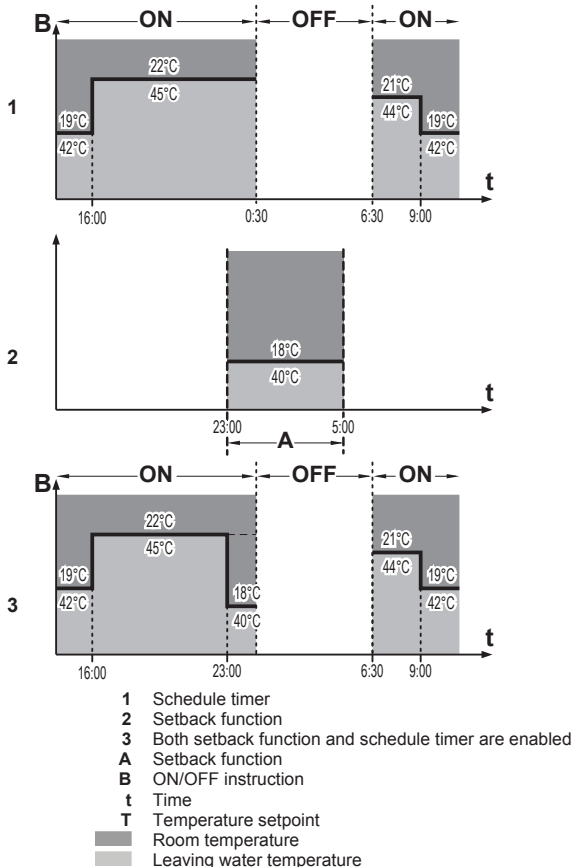
#### Space heating

##### [0-03] Status

Defines whether the ON/OFF instruction can be used in the schedule timer for space heating.

| Space heating based on ON/OFF instruction |   |
|---|---|
| During operation                          | When the schedule timer switches space heating OFF, the controller will be switched off (operation LED will stop working).  |
| Press <b>**o</b>                          | <p>The schedule timer for space heating will stop (when active at that moment) and will start again at the next scheduled ON function.</p> <p>The "last" programmed command overrides the "preceding" programmed command and will remain active until the "next" programmed command occurs.</p> <p>Example: imagine the actual time is 17:30 and actions are programmed at 13:00, 16:00 and 19:00. The "last" programmed command (16:00) overruled the "previous" programmed command (13:00) and will remain active until the "next" programmed command (19:00) occurs.</p> <p>So in order to know the actual setting, you should consult the last programmed command (this may date from the day before).</p> <p>The controller is switched off (operation LED off), but the schedule timer icon remains on.</p> |
| Press <b>o/⊕</b>                          | <p>The schedule timer for space heating and the quiet mode stops and will not start again.</p> <p>The schedule timer icon is not displayed any more.</p>  |

- Operation example: Schedule timer based on ON/OFF instruction. When the setback function (see field setting [2]) is enabled, the setback operation will have priority over the scheduled action in the schedule timer if ON instruction is active. If OFF instruction is active this will have priority over the setback function. At any time the OFF instruction will have the highest priority.

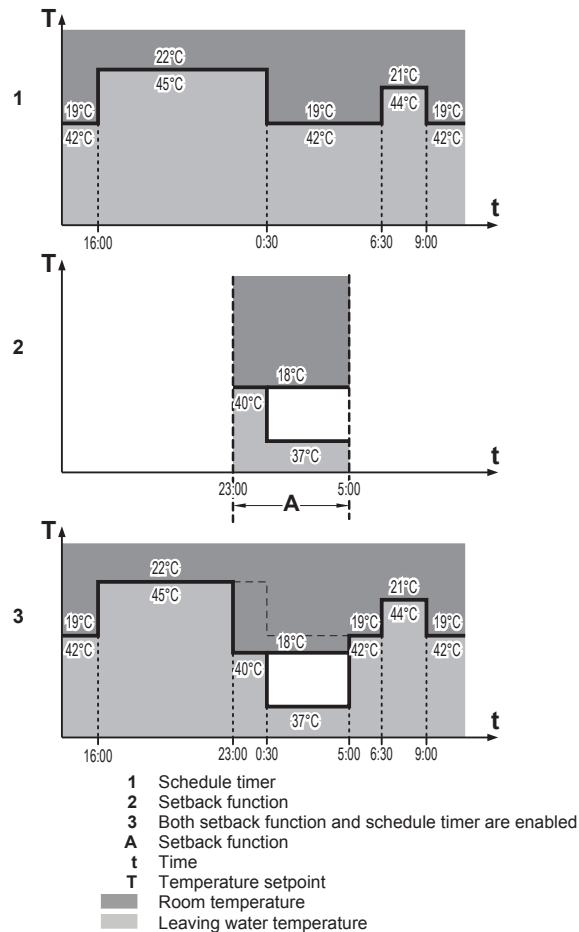


| Space heating based on temperature setpoint <sup>(a)</sup> |  |
|--|--|
| During operation   | During schedule timer operation the operation LED is lit continuously.   |
| Press <b>**o</b>   | <p>The schedule timer for space heating stops and will not start again.</p> <p>The controller is switched off (operation LED off).</p>                   |
| Press <b>o/⊕</b>   | <p>The schedule timer for space heating and the quiet mode stops and will not start again.</p> <p>The schedule timer icon is not displayed any more.</p> |

(a) For leaving water temperature and/or room temperature

- Operation example: Schedule timer based on temperature setpoint

When the setback function (see field setting [2]) is enabled, the setback operation will have priority over the scheduled action in the schedule timer.



**i** INFORMATION

Space heating based on temperature setpoint is enabled by default, so only temperature shifts are possible (no ON/OFF instruction).

**Space cooling**

**[0-04] Status**

Defines whether the ON/OFF instruction can be used in the schedule timer for cooling.

This is the same as for space heating [0-03], but the setback function is not available.

## 12 Operation

### **i** INFORMATION

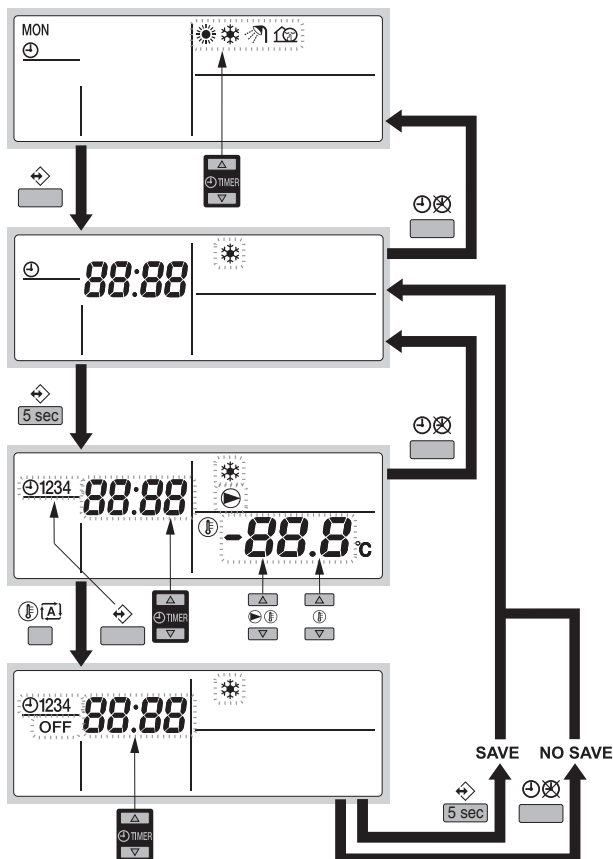
Space cooling based on temperature setpoint is enabled by default, so only temperature shifts are possible (no ON/OFF instruction).

#### Quiet mode

See "To program quiet mode" on page 51.

Switch the mode on or off at a scheduled time. Four actions can be programmed per day. These actions are repeated daily.

#### To program space cooling



### **i** INFORMATION

Press  $\otimes/\odot$  to return to previous steps in the programming procedure without saving modified settings.

- 1 Press  $\diamond$  to enter the programming/consulting mode.
- 2 Select the operation mode you would like to program using  $\odot/\blacktriangle$  and  $\odot/\blacktriangledown$ .  
**Result:** The actual mode is blinking.
- 3 Press  $\diamond$  to confirm the selected mode.  
**Result:** The time is blinking.
- 4 Consult the action(s) using  $\odot/\blacktriangle$  and  $\odot/\blacktriangledown$ .
- 5 Hold down  $\diamond$  for 5 seconds to program the detailed actions.  
**Result:** The first programmed action appears.
- 6 Select the action number you would like to program or to modify using  $\diamond$ .
- 7 Set the correct action time using  $\odot/\blacktriangle$  and  $\odot/\blacktriangledown$ .
- 8 Set the leaving water temperature using  $\blacktriangleright/\blacktriangle$  and  $\blacktriangleright/\blacktriangledown$ .
- 9 Set the room temperature using  $\blacktriangle/\blacktriangle$  and  $\blacktriangle/\blacktriangledown$ .

10 Select **OFF** using  $\otimes/\blacktriangle$  to switch cooling and the remote controller off.

11 Repeat this procedure to program the other actions.

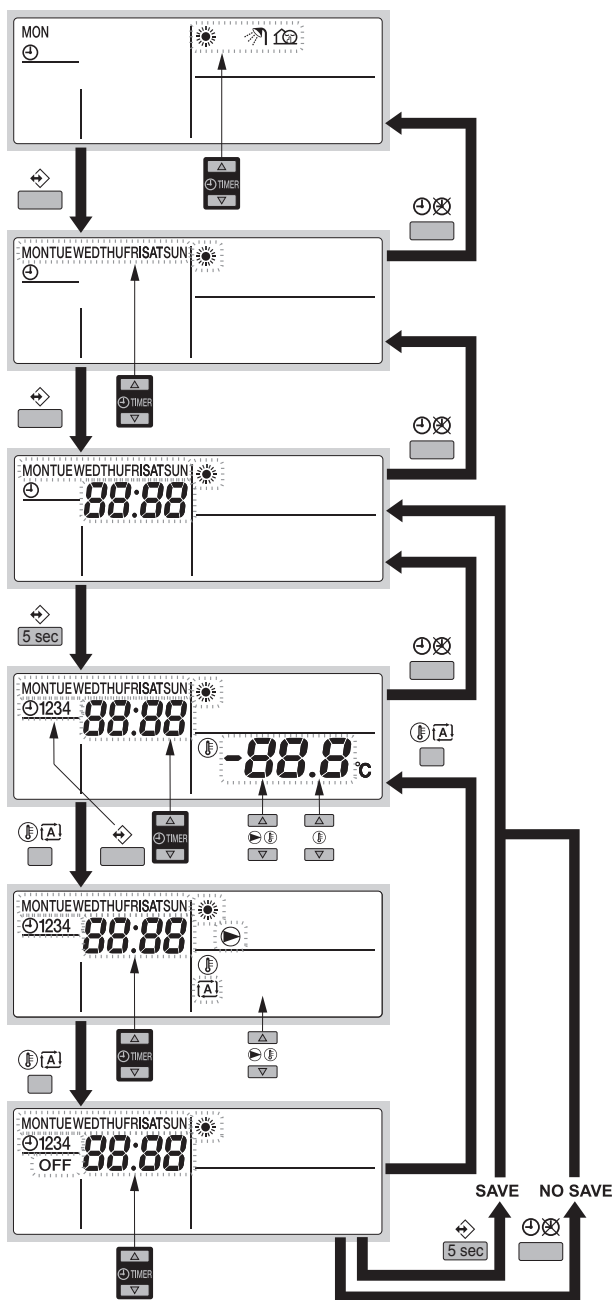
**Result:** When all actions have been programmed, make sure that the display shows the highest action number you would like to save.

12 Press  $\diamond$  for 5 seconds to store the programmed actions.

**Result:** If  $\diamond$  is pressed when action number 3 is displayed, actions 1, 2 and 3 are stored, but action 4 is deleted. You automatically return to step 6. Press  $\otimes/\odot$  several times to return to previous steps in this procedure and finally return to normal operation.

13 You automatically return to step 6; start again to program the following day.

#### To program space heating



**i** INFORMATION

Press  $\text{⏪}/\text{⏩}$  to return to previous steps in the programming procedure without saving modified settings.

- 1 Press  $\text{⏪}$  to enter the programming/consulting mode.
- 2 Select the operation mode you would like to program using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

**Result:** The actual mode is blinking.

- 3 Press  $\text{⏪}$  to confirm the selected mode.

**Result:** The actual day is blinking.

- 4 Select the day you would like to consult or to program using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

**Result:** The selected day is blinking.

- 5 Press  $\text{⏪}$  to confirm the selected day.

- 6 Hold down  $\text{⏪}$  for 5 seconds to program the detailed actions.

**Result:** The first programmed action of the selected day appears.

- 7 Select the action number you would like to program or to modify using  $\text{⏪}$ .

- 8 Set the correct action time using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

- 9 Set the leaving water temperature using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

- 10 Set the room temperature using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

- 11 Press  $\text{⏮}/\text{⏭}$  to select:

- OFF: to switch heating and the remote controller off.
- $\text{⏮}/\text{⏭}$ : to select automatic temperature calculation for leaving water temperature

- 12 Set the appropriate shift value using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ . For more information about weather dependent setpoint, see "12.3.6 Schedule timer" on page 48.

- 13 Repeat this procedure to program the other actions of the selected day.

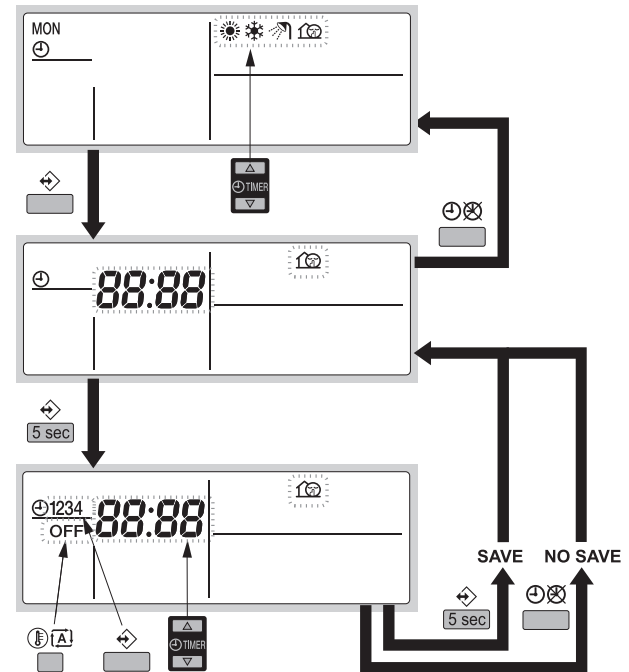
**Result:** When all actions have been programmed, make sure that the display shows the highest action number you would like to save.

- 14 Press  $\text{⏪}$  for 5 seconds to store the programmed actions.

**Result:** If  $\text{⏪}$  is pressed when action number 3 is displayed, actions 1, 2 and 3 are stored, but action 4 is deleted. You automatically return to step 6. Press  $\text{⏪}/\text{⏩}$  several times to return to previous steps in this procedure and finally return to normal operation.

- 15 You automatically return to step 6; start again to program the following day.

## To program quiet mode

**i** INFORMATION

Press  $\text{⏪}/\text{⏩}$  to return to previous steps in the programming procedure without saving modified settings.

- 1 Press  $\text{⏪}$  to enter the programming/consulting mode.
- 2 Select the operation mode you would like to program using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

**Result:** The actual mode is blinking.

- 3 Press  $\text{⏪}$  to confirm the selected mode.

- 4 Consult the action(s) using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

- 5 Hold down  $\text{⏪}$  for 5 seconds to program the detailed actions.

**Result:** The first programmed action appears.

- 6 Select the action number you would like to program or to modify using  $\text{⏪}$ .

- 7 Set the correct action time using  $\text{⏪}/\text{⏩}$  and  $\text{⏮}/\text{⏭}$ .

- 8 Select or deselect OFF as an action using  $\text{⏮}/\text{⏭}$ .

- 9 Repeat this procedure to program the other actions of the selected mode.

**Result:** When all actions have been programmed, make sure that the display shows the highest action number you would like to save.

- 10 Press  $\text{⏪}$  for 5 seconds to store the programmed actions.

**Result:** If  $\text{⏪}$  is pressed when action number 3 is displayed, actions 1, 2 and 3 are stored, but action 4 is deleted. You automatically return to step 6. Press  $\text{⏪}/\text{⏩}$  several times to return to previous steps in this procedure and finally return to normal operation.

- 11 You automatically return to step 6; start again to program the following day.

## To consult programmed actions

**i** INFORMATION

Press  $\text{⏪}/\text{⏩}$  to return to previous steps in the consulting procedure.

- 1 Press  $\text{⏪}$  to enter the programming/consulting mode.



## 13 Maintenance and service

- 2 Select the operation mode you would like to consult using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The actual mode is blinking.

- 3 Press  $\diamond$  to confirm the selected mode.

**Result:** The actual day is blinking.

- 4 Select the day you would like to consult using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The selected day is blinking.

- 5 Press  $\diamond$  to confirm the selected day.

**Result:** The first programmed action of the selected day appears.

- 6 Consult the other programmed actions of that day using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** This is called the readout mode. Empty program actions (e.g. 4) are not displayed. Press  $\boxtimes/\oplus$  several times to return to previous steps in this procedure and finally return to normal operation.

### Schedule timer tips and tricks

#### To program the next day(s)

- 1 After confirming the programmed actions of a specific day, press  $\boxtimes/\oplus$  once.

**Result:** You can now select another day using  $\ominus$ ▲ and  $\ominus$ ▼ and restart consulting and programming.

#### To delete one or more programmed actions

Deleting one or more programmed actions is done at the same time as storing the programmed actions.

When all actions for one day have been programmed, make sure that the display shows the highest action number you would like to save. Pressing  $\diamond$  for 5 seconds stores all actions except those with a higher action number than the one that is displayed.

**Example:** Pressing  $\diamond$  when action number 3 is displayed, stores actions 1, 2 and 3, but deletes action 4.

#### To copy programmed actions to the next day

In space heating program it is possible to copy all programmed actions of a specific day to the next day (e.g. copy all programmed actions from "MON" to "TUE").

- 1 Press  $\diamond$ .

**Result:** The actual mode is blinking.

- 2 Select the mode you want to program using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The selected mode is blinking. You can leave programming by pressing  $\boxtimes/\oplus$ .

- 3 Press  $\diamond$  to confirm the selected mode.

**Result:** The actual day is blinking.

- 4 Select the day you would like to copy to the next day using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The selected day is blinking. Press  $\boxtimes/\oplus$  to return to step 2.

- 5 Press  $\diamond$  and  $\boxtimes/\oplus$  simultaneously for 5 seconds.

- 6 After 5 seconds the display will show the next day (e.g. "TUE" if "MON" was selected first). This indicates that the day has been copied.

- 7 Press  $\boxtimes/\oplus$  to return to step 2.

#### To delete a mode

- 1 Press  $\diamond$ .

**Result:** The actual mode is blinking.

- 2 Select the mode you want to delete using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The selected mode is blinking.

- 3 Press  $\diamond$  and  $\boxtimes/\oplus$  simultaneously for 5 seconds to delete the selected mode.

#### To delete a day of the week

- 1 Press  $\diamond$ .

**Result:** The actual mode is blinking.

- 2 Select the mode you want to delete using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The selected mode is blinking.

- 3 Press  $\diamond$  to confirm the selected mode.

**Result:** The actual day is blinking.

- 4 Select the day you would like to delete using  $\ominus$ ▲ and  $\ominus$ ▼.

**Result:** The selected day is blinking.

- 5 Press  $\diamond$  and  $\boxtimes/\oplus$  simultaneously for 5 seconds to delete the selected day.

### 12.3.7 Operating the optional demand PCB

An optional PCB EKRPAHTA can be connected to the unit and be used to remotely control the unit.

The 3 inputs allow:

- remote switching between cooling and heating
- remote thermo on/off
- remote unit on/off

For more details about this option kit, refer to the wiring diagram of the unit.



#### INFORMATION

The signal (voltage free) must take at least 50 ms.

See also field setting [6-01] in "6.1.9 Field settings on the user interface" on page 29 for setting the function of your preference.

### 12.3.8 Operating the optional external control adapter

An optional control adapter PCB DTA104A62 can be connected to the unit and be used to remotely control 1 or more units.

By short-circuiting contacts on the option kit PCB, you can:

- reduce capacity to about 70%,
- reduce capacity to about 40%,
- force thermo off,
- capacity save (fan low speed turn, compressor frequency control).

For more details about this option kit, refer to a separate instruction that is delivered with the unit.

### 12.3.9 Operating the optional remote controller

If besides the main remote controller the optional remote controller is installed as well, the main remote controller (master) can access all settings while the second remote controller (slave) can not access schedule settings and parameter settings.

Refer to the installation manual for more details.

## 13 Maintenance and service



#### NOTICE

Never inspect or service the unit by yourself. Ask a qualified service person to perform this work.





### WARNING

Never replace a fuse with a fuse of a wrong ampere ratings or other wires when a fuse blows out. Use of wire or copper wire may cause the unit to break down or cause a fire.



### CAUTION

Do NOT insert fingers, rods or other objects into the air inlet or outlet. Do NOT remove the fan guard. When the fan is rotating at high speed, it will cause injury.



### CAUTION: Pay attention to the fan!

It is dangerous to inspect the unit while the fan is running.

Be sure to turn off the main switch before executing any maintenance task.



### CAUTION

After a long use, check the unit stand and fitting for damage. If damaged, the unit may fall and result in injury.

## 13.1 About the refrigerant

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



### WARNING

The refrigerant in the system is safe and normally does not leak. If the refrigerant leaks in the room, contact with a fire of a burner, a heater or a cooker may result in a harmful gas.

Turn off any combustible heating devices, ventilate the room and contact the dealer where you purchased the unit.

Do not use the system until a service person confirms that the portion where the refrigerant leaks is repaired.

## 13.2 After-sales service and warranty

### 13.2.1 Warranty period

- This product includes a warranty card that was filled in by the dealer at the time of installation. The completed card has to be checked by the customer and stored carefully.
- If repairs to the product are necessary within the warranty period, contact your dealer and keep the warranty card at hand.

### 13.2.2 Recommended maintenance and inspection

Since dust collects when using the unit for several years, performance of the unit will deteriorate to some extent. As taking apart and cleaning interiors of units requires technical expertise and in order to ensure the best possible maintenance of your units, we recommend to enter into a maintenance and inspection contract on top of normal maintenance activities. Our network of dealers has access to a permanent stock of essential components in order to keep your unit in operation as long as possible. Contact your dealer for more information.

**When asking your dealer for an intervention, always state:**

- The complete model name of the unit.
- The manufacturing number (stated on the nameplate of the unit).
- The installation date.
- The symptoms or malfunction, and details of the defect.

### 13.2.3 Recommended maintenance and inspection cycles

Be aware that the mentioned maintenance and replacement cycles do not relate to the warranty period of the components.

| Component                   | Inspection cycle | Maintenance cycle (replacements and/or repairs) |
|-----------------------------|------------------|---|
| Electric motor              | 1 year           | 20,000 hours                                    |
| PCB                         |                  | 25,000 hours                                    |
| Heat exchanger              |                  | 5 years   |
| Sensor (thermistor, etc.)   |                  | 5 years   |
| User interface and switches |                  | 25,000 hours                                    |
| Drain pan                   |                  | 8 years   |
| Expansion valve             |                  | 20,000 hours                                    |
| Solenoid valve              |                  | 20,000 hours                                    |

The table assumes the following conditions of use:

- Normal use without frequent starting and stopping of the unit. Depending on the model, we recommend not starting and stopping the machine more than 6 times/hour.
- Operation of the unit is assumed to be 10 hours/day and 2,500 hours/year.



### NOTICE

- The table indicates main components. Refer to your maintenance and inspection contract for more details.
- The table indicates recommended intervals of maintenance cycles. However, in order to keep the unit operational as long as possible, maintenance work may be required sooner. Recommended intervals can be used for appropriate maintenance design in terms of budgeting maintenance and inspection fees. Depending on the content of the maintenance and inspection contract, inspection and maintenance cycles may in reality be shorter than listed.

## 14 Troubleshooting

If one of the following malfunctions occur, take the measures shown below and contact your dealer.



### WARNING


**Stop operation and shut off the power if anything unusual occurs (burning smells etc.).**

Leaving the unit running under such circumstances may cause breakage, electric shock or fire. Contact your dealer.








The system MUST be repaired by a qualified service person:


| Malfunction   | Measure  |
|---|--|
| If a safety device such as a fuse, a breaker or an earth leakage breaker frequently actuates or the ON/OFF switch does NOT properly work. | Turn OFF the main power switch.                        |
| If water leaks from the unit.   | Stop the operation.                                    |
| The operation switch does NOT work well.  | Turn OFF the power supply.                             |
| If the user interface display indicates the unit number, the operation lamp flashes and the malfunction code appears.                     | Notify your installer and report the malfunction code. |

## 14 Troubleshooting

| Malfunction   | Measure  |
|---|--|
| If a safety device such as a fuse, a breaker or an earth leakage breaker frequently actuates or the ON/OFF switch does NOT properly work.   | Turn OFF the main power switch.                        |
| If water leaks from the unit.   | Stop the operation.                                    |
| The operation switch does NOT work well.  | Turn OFF the power supply.                             |
| If the user interface display indicates  , the unit number, the operation lamp flashes and the malfunction code appears. | Notify your installer and report the malfunction code. |

If the system does NOT properly operate except for the above mentioned cases and none of the above mentioned malfunctions is evident, investigate the system according to the following procedures.

| Malfunction  | Measure   |
|--|---|
| The remote controller display is blank.  | <ul style="list-style-type: none"> <li>Check if there is no power failure. Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after power is restored.</li> <li>Check if no fuse has blown or breaker is activated. Change the fuse or reset the breaker if necessary.</li> <li>Check if the benefit kWh rate power supply is active.</li> </ul>   |
| An error code is displayed on the remote controller.                                 | Consult your local dealer. Refer to "8.1 Error codes: Overview" on page 38 for a detailed list of error codes.  |
| The schedule timer works, but the programmed actions are executed at the wrong time. | Check if the clock and the day of the week are set correctly, and correct if necessary.   |
| The schedule timer is programmed, but does not work.                                 | In case  is not displayed, push  /  to enable the schedule timer.  |
| Capacity shortage.   | Consult your local dealer.  |
| Temperature values on the remote controller are displayed in °F instead of in °C.    | To switch the display between °C and °F, push   and   simultaneously for 5 seconds. The default temperature display is in °C. |

| Malfunction   | Measure  |
|---|--|
| If the system does not operate at all.  | <ul style="list-style-type: none"> <li>Check if there is no power failure. Wait until power is restored. If power failure occurs during operation, the system automatically restarts immediately after power is restored.</li> <li>Check if no fuse has blown or breaker is activated. Change the fuse or reset the breaker if necessary.</li> </ul>   |
| If the system goes into fan only operation, but as soon as it goes into heating or cooling operation, the system stops. | <ul style="list-style-type: none"> <li>Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles. Remove any obstacles and make sure the air can flow freely.</li> <li>Check if the user interface display shows  (time to clean the air filter). (Refer to "13 Maintenance and service" on page 52.)</li> </ul> |

| Malfunction   | Measure   |
|---|---|
| The system operates but cooling or heating is insufficient. | <ul style="list-style-type: none"> <li>Check if air inlet or outlet of outdoor or indoor unit is not blocked by obstacles. Remove any obstacles and make sure the air can flow freely.</li> <li>Check if the air filter is not clogged (refer to "13 Maintenance and service" on page 52).</li> <li>Check the temperature setting.</li> <li>Check the fan speed setting on your user interface.</li> <li>Check for open doors or windows. Close doors and windows to prevent wind from coming in.</li> <li>Check if there are too many occupants in the room during cooling operation. Check if the heat source of the room is excessive.</li> <li>Check if direct sunlight enters the room. Use curtains or blinds.</li> <li>Check if the air flow angle is proper.</li> </ul> |

If after checking all above items, it is impossible to fix the problem yourself, contact your installer and state the symptoms, the complete model name of the unit (with manufacturing number if possible) and the installation date (possibly listed on the warranty card).

### 14.1 Error codes: Overview

In case a malfunction code appears on the indoor unit user interface display, contact your installer and inform the malfunction code, the unit type, and serial number (you can find this information on the nameplate of the unit).

For your reference, a list with malfunction codes is provided. You can, depending on the level of the malfunction code, reset the code by pushing the ON/OFF button. If not, ask your installer for advice.

| Main code | Contents   |
|-----------|--|
| <i>R1</i> | EEPROM failure (indoor unit)   |
| <i>RE</i> | Water circuit malfunction (indoor unit)                                  |
| <i>R9</i> | Expansion valve malfunction (indoor unit)                                |
| <i>RE</i> | Water system warning (indoor unit)                                       |
| <i>RJ</i> | Capacity setting malfunction (indoor unit)                               |
| <i>C1</i> | ACS communication malfunction (indoor unit)                              |
| <i>C4</i> | Refrigerant liquid thermistor malfunction (indoor unit)                  |
| <i>C9</i> | Returning water thermistor malfunction (indoor unit)                     |
| <i>CR</i> | Heating leaving water thermistor malfunction (indoor unit)               |
| <i>CJ</i> | User interface thermistor malfunction (indoor unit)                      |
| <i>E3</i> | High pressure switch was activated (indoor unit)                         |
| <i>E4</i> | Low pressure malfunction (indoor unit)                                   |
| <i>J7</i> | Refrigerant suction sensor (indoor unit)                                 |
| <i>P2</i> | Refrigerant charging aborted (outdoor unit)                              |
| <i>P8</i> | Automatic refrigerant charging related (outdoor unit)                    |
| <i>PR</i> | Refrigerant tank empty (outdoor unit)                                    |
| <i>PC</i> | Refrigerant tank empty (outdoor unit)                                    |
| <i>PH</i> | Refrigerant tank empty (outdoor unit)                                    |
| <i>U1</i> | Reversed power supply phase malfunction (indoor unit)                    |
| <i>U2</i> | Insufficient supply voltage (indoor unit)                                |
| <i>UB</i> | Two user interfaces are connected and both are set to main (indoor unit) |

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| Main code | Contents   |
|-----------|--|
| <i>UR</i> | Type connection problem (indoor unit)                  |
| <i>UH</i> | Auto address malfunction (inconsistency) (indoor unit) |

## 15 Relocation

Contact your dealer for removing and reinstalling the total unit. Moving units requires technical expertise.

## 16 Disposal

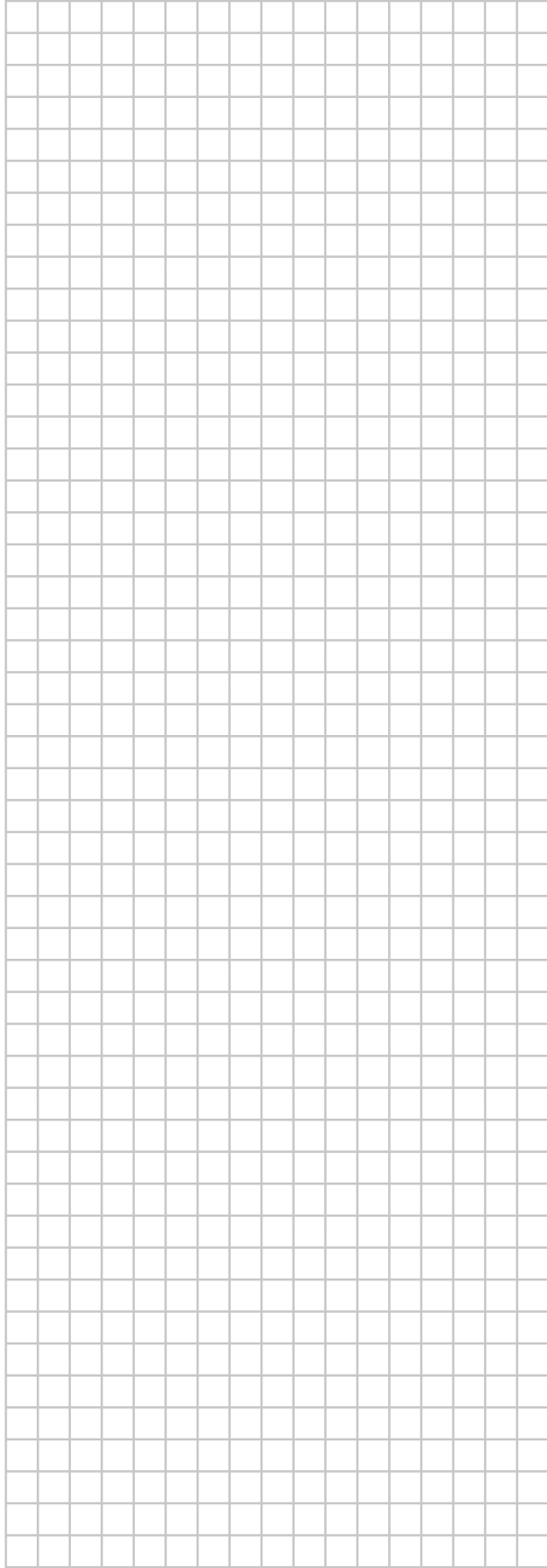
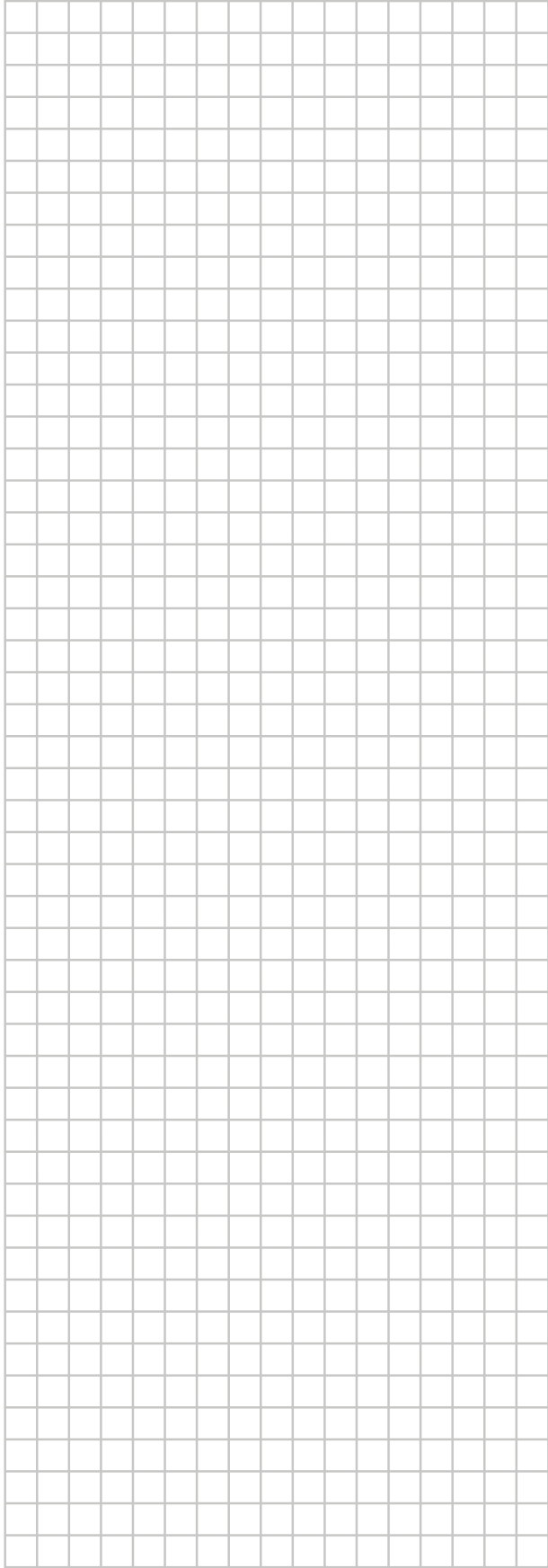
This unit uses hydrofluorocarbon. Contact your dealer when discarding this unit.

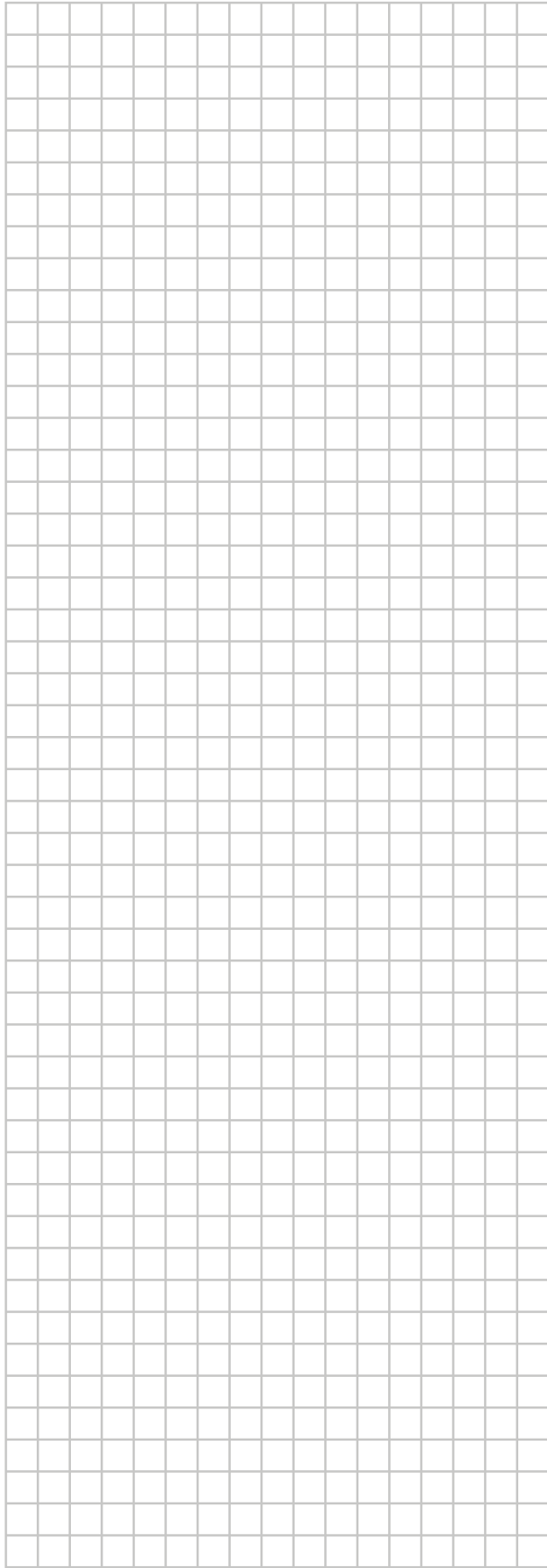
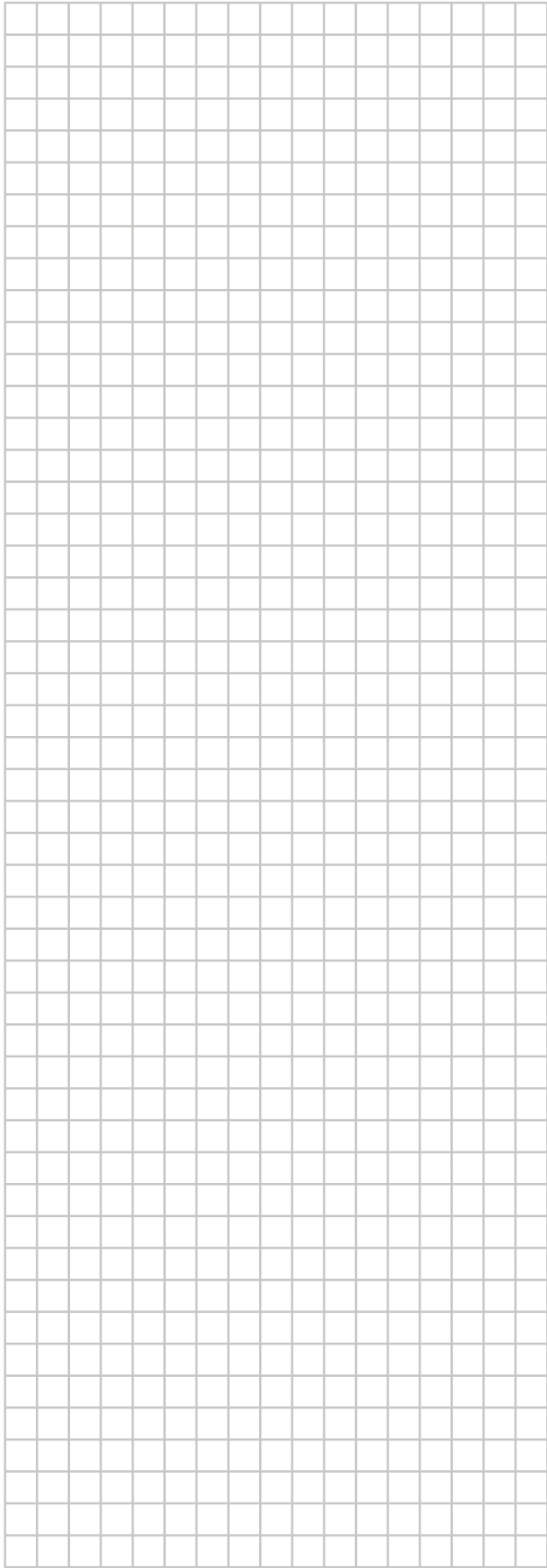


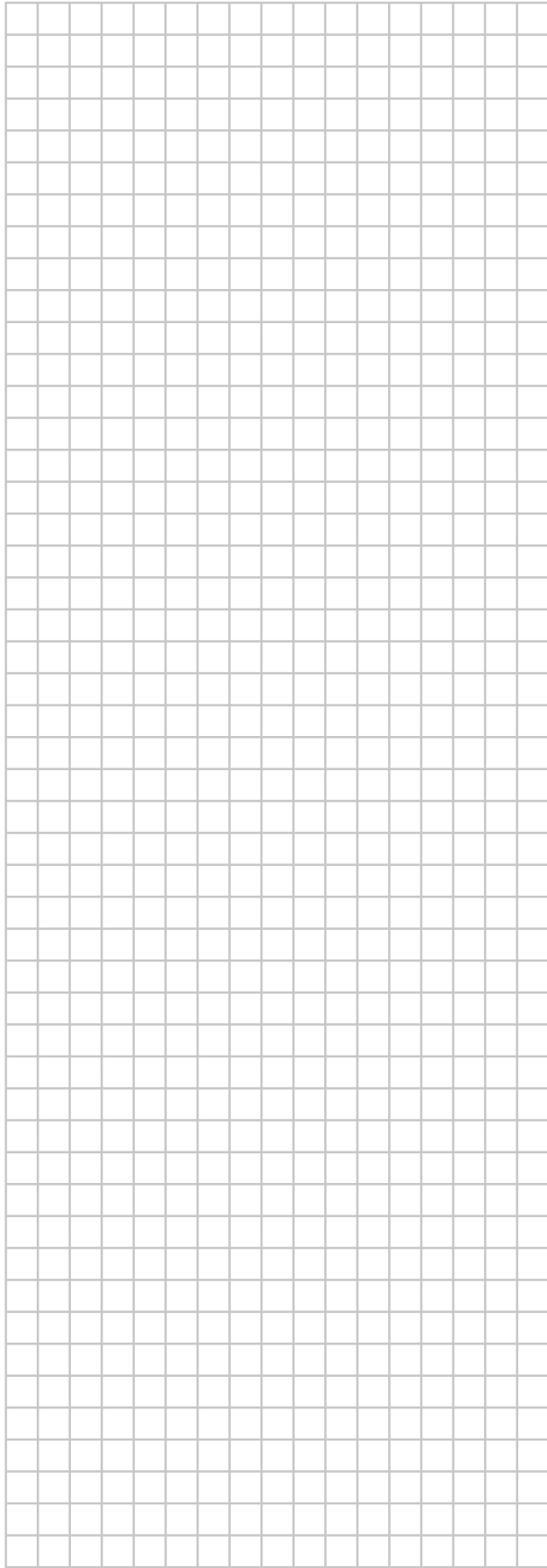
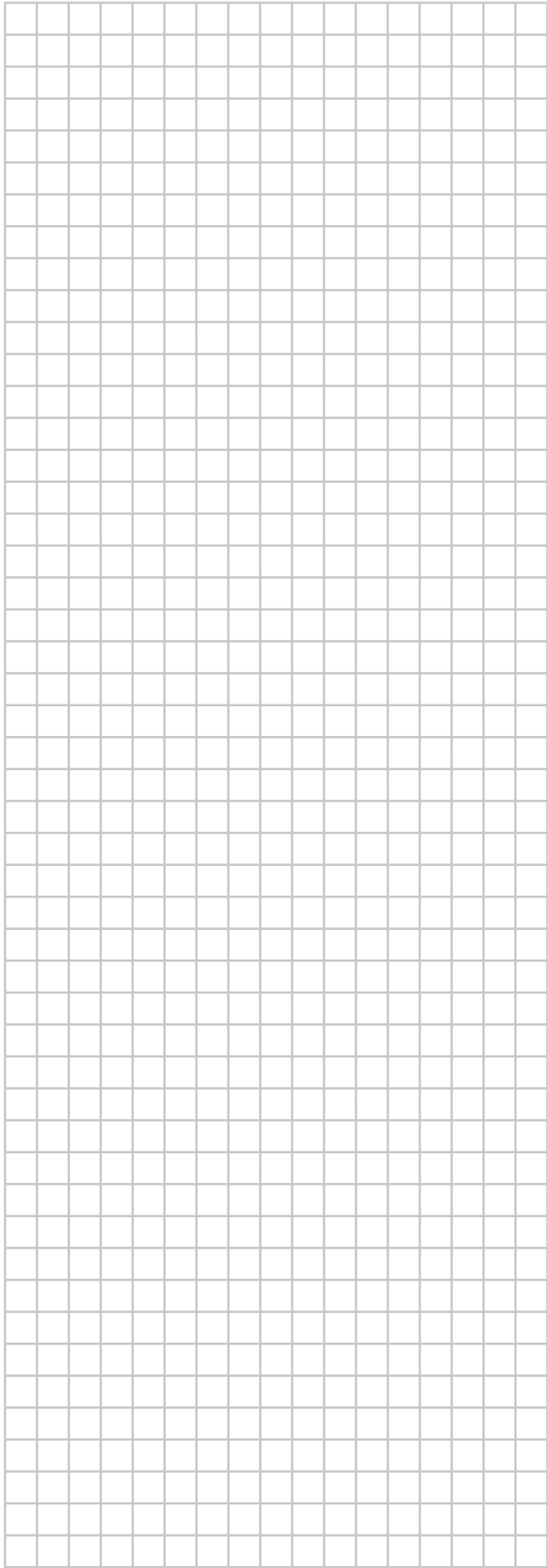
### NOTICE

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.

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**EAC**



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