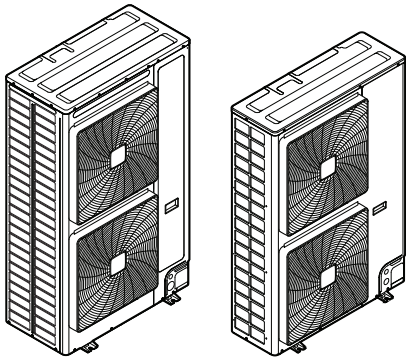




# Installation and operation manual



## VRV 5-S system air conditioner

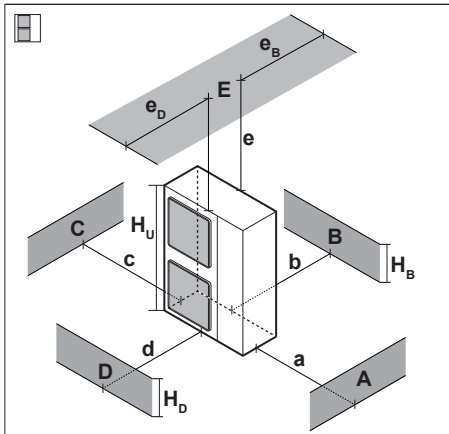


**VRV 5**

RXYSA8AMY1B  
RXYSA10AMY1B  
RXYSA12AMY1B

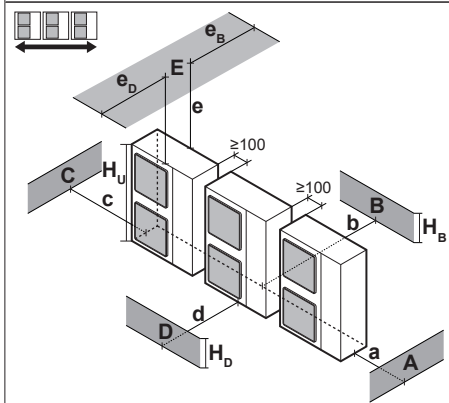
Installation and operation manual  
VRV 5-S system air conditioner

English



A~E	H <sub>B</sub> H <sub>D</sub> H <sub>U</sub>	[mm]						
		a	b	c	d	e	e <sub>B</sub>	e <sub>D</sub>
B	—		≥100					
A, B, C	—	≥100	≥100	≥100				
B, E	—		≥100			≥1000		≤500
A, B, C, E	—	≥150	≥150	≥150		≥1000		≤500
D	—				≥500			
D, E	—				≥1000	≥1000	≤500	
B, D	—		≥100		≥1000			
B, D, E	H <sub>B</sub> < H <sub>D</sub>	H <sub>B</sub> ≤ ½H <sub>U</sub>	≥250		≥1000	≥1000	≤500	
		½H <sub>U</sub> < H <sub>B</sub> ≤ H <sub>U</sub>	≥250		≥1250	≥1000	≤500	
	H <sub>B</sub> > H <sub>D</sub>	⊘						
		H <sub>D</sub> ≤ ½H <sub>U</sub>	≥100		≥1000	≥1000		≤500
	½H <sub>U</sub> < H <sub>D</sub> ≤ H <sub>U</sub>	≥200		≥1000	≥1000		≤500	
	H <sub>D</sub> > H <sub>U</sub>	≥200		≥1700	≥1000		≤500	

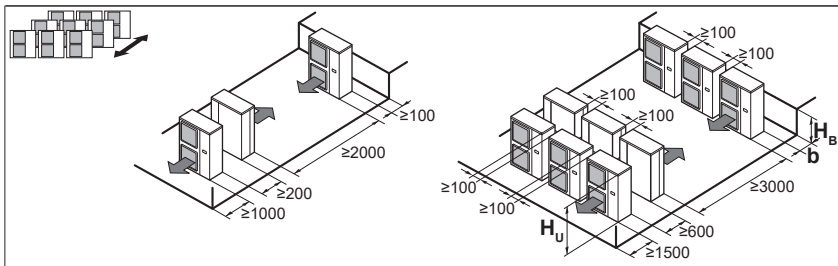
1



A, B, C	—	≥200	≥300	≥1000				
A, B, C, E	—	≥200	≥300	≥1000		≥1000		≤500
D	—				≥1000			
D, E	—				≥1000	≥1000	≤500	
B, D	H <sub>D</sub> > H <sub>U</sub>	≥300		≥1000				
	H <sub>D</sub> ≤ ½H <sub>U</sub>	≥250		≥1500				
	½H <sub>U</sub> < H <sub>D</sub> ≤ H <sub>U</sub>	≥300		≥1500				
B, D, E	H <sub>B</sub> < H <sub>D</sub>	H <sub>B</sub> ≤ ½H <sub>U</sub>	≥300		≥1000	≥1000	≤500	
		½H <sub>U</sub> < H <sub>B</sub> ≤ H <sub>U</sub>	≥300		≥1250	≥1000	≤500	
	H <sub>B</sub> > H <sub>D</sub>	⊘						
		H <sub>D</sub> ≤ ½H <sub>U</sub>	≥250		≥1500	≥1000		≤500
	½H <sub>U</sub> < H <sub>D</sub> ≤ H <sub>U</sub>	≥300		≥1500	≥1000		≤500	
	H <sub>D</sub> > H <sub>U</sub>	≥300		≥2200	≥1000		≤500	

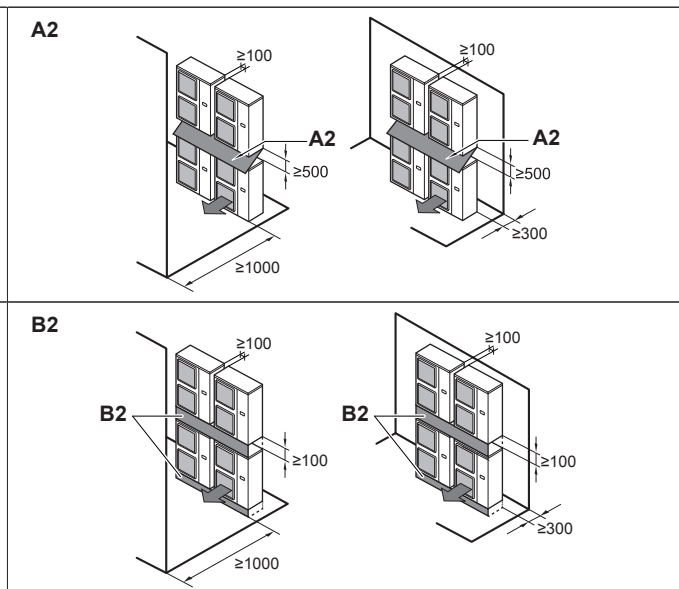
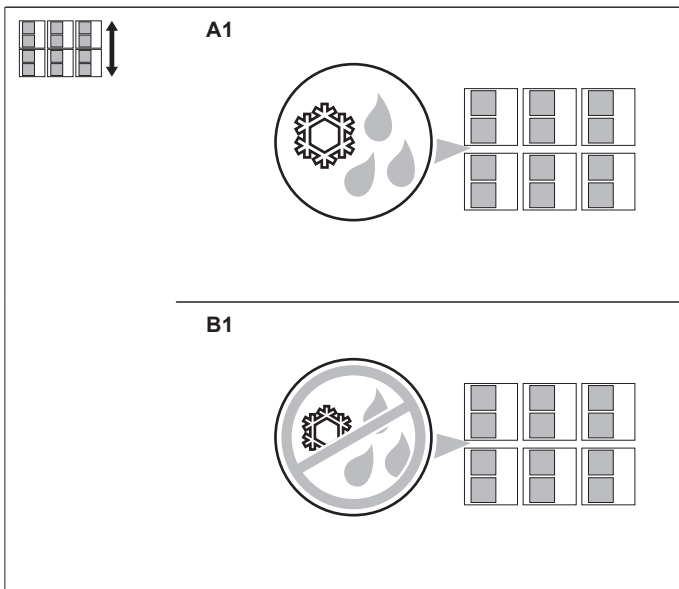
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1



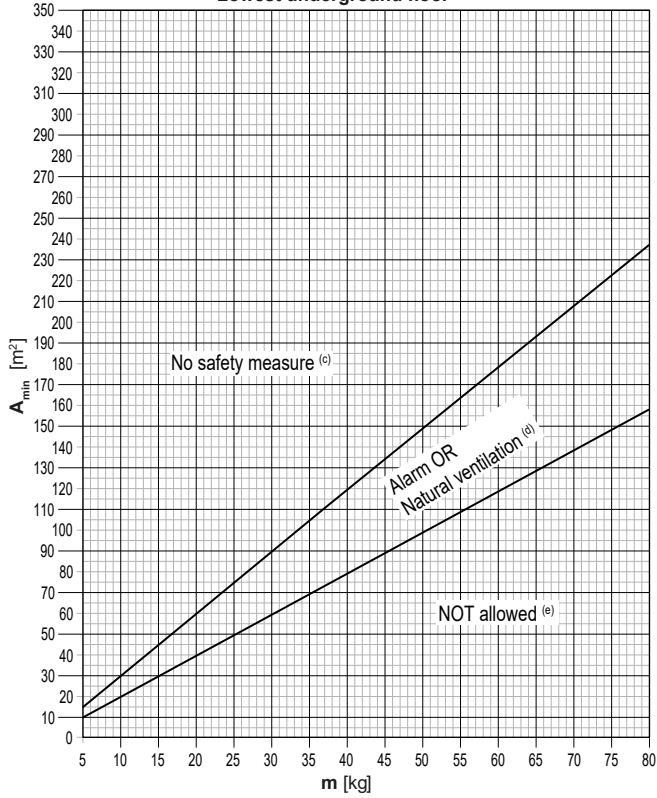
H <sub>B</sub> H <sub>U</sub>	b [mm]
H <sub>B</sub> ≤ ½H <sub>U</sub>	b ≥ 250
½H <sub>U</sub> < H <sub>B</sub> ≤ H <sub>U</sub>	b ≥ 300
H <sub>B</sub> > H <sub>U</sub>	⊘

2

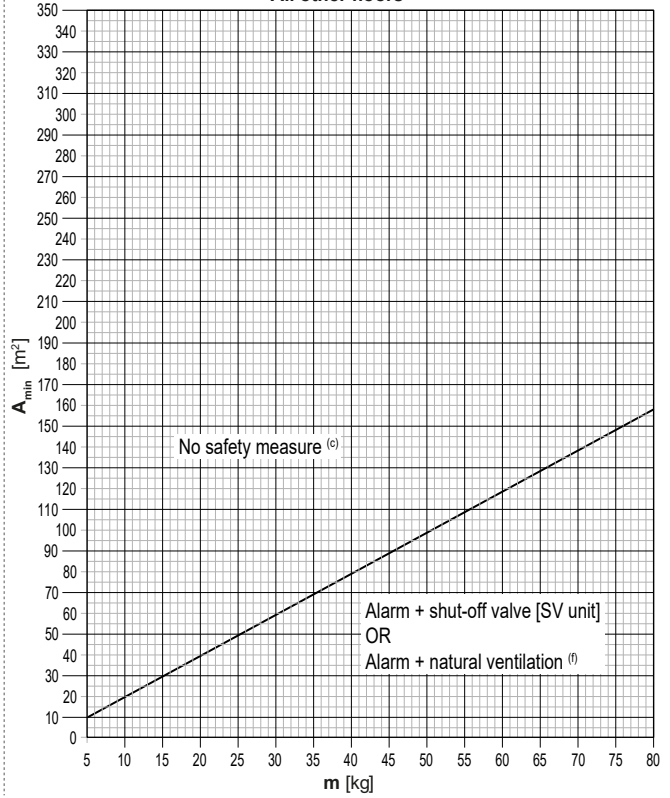


3

**Lowest underground floor (a)**



**All other floors (b)**



m [kg]	A <sub>min</sub> [m <sup>2</sup> ]		
	Lowest underground floor (a)		All other floors (b)
	No safety measure (c)	Alarm OR Natural Ventilation (d)	No safety measure (c)
5	15	10	10
6	18	12	12
7	21	14	14
8	24	16	16
9	27	18	18
10	30	20	20
11	33	22	22
12	36	24	24
13	39	26	26
14	42	28	28
15	45	30	30
16	48	32	32
17	51	34	34
18	54	36	36
19	57	38	38
20	60	40	40
21	63	42	42
22	66	44	44
23	69	46	46
24	72	48	48
25	75	50	50
26	77	52	52
27	80	54	54
28	83	56	56
29	86	58	58
30	89	60	60
31	92	62	62
32	95	64	64
33	98	66	66
34	101	68	68
35	104	70	70
36	107	72	72
37	110	74	74
38	113	76	76
39	116	77	77
40	119	79	79
41	122	81	81
42	125	83	83

m [kg]	A <sub>min</sub> [m <sup>2</sup> ]		
	Lowest underground floor (a)		All other floors (b)
	No safety measure (c)	Alarm OR Natural Ventilation (d)	No safety measure (c)
43	128	85	85
44	131	87	87
45	134	89	89
46	137	91	91
47	140	93	93
48	143	95	95
49	146	97	97
50	149	99	99
51	152	101	101
52	154	103	103
53	157	105	105
54	160	107	107
55	163	109	109
56	166	111	111
57	169	113	113
58	172	115	115
59	175	117	117
60	178	119	119
61	181	121	121
62	184	123	123
63	187	125	125
64	190	127	127
65	193	129	129
66	196	131	131
67	199	133	133
68	202	135	135
69	205	137	137
70	208	139	139
71	211	141	141
72	214	143	143
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# 1 About this document

## Target audience

Authorised installers + end users



### INFORMATION

This appliance is intended to be used by expert or trained users in shops, in light industry, and on farms, or for commercial and household 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)
- **Outdoor unit installation and operation manual:**
  - Installation and operation instructions
  - Format: paper (in the box of the outdoor 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 <https://www.daikin.eu>. Use the search function 🔍 to find your model.

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

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

# 2 Specific installer safety instructions

Always observe the following safety instructions and regulations.

Installation site (see "[14.1 Preparing the installation site](#)" ▶ 27])



### WARNING

Follow the service space dimensions in this manual to install the unit correctly. See "[24.1 Service space: Outdoor unit](#)" ▶ 52].



### WARNING

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



### CAUTION

Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.



### WARNING

If the appliance contains R32 refrigerant, the floor area of the room in which the appliance is stored shall be at least 429 m<sup>2</sup>.

## 2 Specific installer safety instructions

### WARNING

If one or more rooms are connected to the unit using a duct system, make sure:

- there are no operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) in case the floor area is less than the minimum floor area A (m<sup>2</sup>).
- no auxiliary devices, which may be a potential ignition source, are installed in the duct work (example: hot surfaces with a temperature exceeding 700°C and electric switching device);
- only auxiliary devices approved by the manufacturer are used in the duct work;
- air inlet AND outlet are connected directly to the same room by ducting. Do NOT use spaces such as a false ceiling as a duct for the air inlet or outlet.

Opening and closing the unit (see "[14.2 Opening and closing the unit](#)" [p 28])

### DANGER: RISK OF BURNING/SCALDING

### DANGER: RISK OF ELECTROCUTION

### DANGER: RISK OF ELECTROCUTION

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

Mounting the outdoor unit (see "[14.3 Mounting the outdoor unit](#)" [p 28])

### WARNING

Fixing method of the outdoor unit MUST be in accordance with the instructions from this manual. See "[14.3 Mounting the outdoor unit](#)" [p 28].

Connecting the refrigerant piping (see "[15.2 Connecting the refrigerant piping](#)" [p 31])

### WARNING

Field piping MUST be in accordance with the instructions from this manual. See "[15 Piping installation](#)" [p 29].

### CAUTION

Piping MUST be installed according to instructions given in "[15 Piping installation](#)" [p 29]. Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

Low temperature solder alloys shall not be used for pipe connections.

### CAUTION

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

### CAUTION

Install the refrigerant piping or components in a position where they are unlikely to be exposed to any substance which may corrode components containing refrigerant, unless the components are constructed of materials that are inherently resistant to corrosion or are suitably protected against corrosion.

### WARNING

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

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

### WARNING

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

### WARNING

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

### CAUTION

Do NOT vent gases into the atmosphere.

### 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.

### WARNING



NEVER remove the pinched piping by brazing.

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

Charging refrigerant (see "[16 Charging refrigerant](#)" [p 35])

### WARNING

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

### WARNING

Charging of refrigerant MUST be in accordance with the instructions from this manual. See "[16 Charging refrigerant](#)" [p 35].

### WARNING

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

### Electrical installation (see "17 Electrical installation" [▶ 38])



#### WARNING

Electrical wiring **MUST** be in accordance with the instructions from:

- This manual. See "17 Electrical installation" [▶ 38].
- The wiring diagram, which is delivered with the unit, located at the inside of the service cover. For a translation of its legend, see "24.3 Wiring diagram: Outdoor unit" [▶ 53].



#### WARNING

The appliance **MUST** be installed in accordance with national wiring regulations.



#### CAUTION

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



#### WARNING

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



#### WARNING

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



#### WARNING

The electrical components shall only be replaced with parts specified by the appliance manufacturer. Replacement with other parts may result in the ignition of refrigerant in the event of a leak.



#### WARNING

If the supply cord is damaged, it **MUST** be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.



#### WARNING

**ALWAYS** use multicore cable for power supply cables.



#### CAUTION

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

### Commissioning (see "19 Commissioning" [▶ 44])



#### WARNING

Commissioning **MUST** be in accordance with the instructions from this manual. See "19 Commissioning" [▶ 44].



#### CAUTION

**Do NOT perform the test operation while working on the indoor unit(s).**

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.

### Troubleshooting (see "22 Troubleshooting" [▶ 48])



#### WARNING

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



#### WARNING

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



## 3 User safety instructions

### 2.1 Instructions for equipment using R32 refrigerant



#### A2L WARNING: MILDLY FLAMMABLE MATERIAL

The refrigerant inside this unit is mildly flammable.



#### WARNING

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



#### WARNING

The appliance shall be stored/installed as follows:

- in such a way as to prevent mechanical damage.
- in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).
- in a room with dimensions as specified in "[13 Special requirements for R32 units](#)" [▶ 19].



#### WARNING

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



#### WARNING

- Take precautions to avoid excessive vibration or pulsation to refrigeration piping.
- Protect the protection devices, piping and fittings as much as possible against adverse environmental effects.
- ALWAYS support the piping at distances of 1 m and 2 m from the SV unit and directly connected indoor units to the outdoor unit.
- Provide space for expansion and contraction of long runs of piping.
- Design and install piping in refrigerating systems such as to minimise the likelihood of hydraulic shock damaging the system.
- Mount the indoor equipment and pipes securely and protect them to avoid accidental rupture of equipment or pipes in case of events such as moving furniture or reconstruction activities.



#### CAUTION

Do NOT use potential sources of ignition in searching for or detection of refrigerant leaks.



#### NOTICE

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

See "[To determine the charge limit](#)" [▶ 24] to check if your system meets the requirement for charge limitation.

## For the user

## 3 User safety instructions

Always observe the following safety instructions and regulations.

### 3.1 General



#### WARNING

If you are NOT sure how to operate the unit, contact your installer.



#### WARNING

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction

concerning use of the appliance in a safe way and understand the hazards involved.

Children SHALL NOT play with the appliance.

Cleaning and user maintenance SHALL NOT be made by children without supervision.



#### WARNING

To prevent electrical shocks or fire:

- Do NOT rinse the unit.
- Do NOT operate the unit with wet hands.
- Do NOT place any objects containing water on the unit.



#### CAUTION

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

- Units are marked with the following symbol:



This means that electrical and electronic products may NOT be mixed with unsorted household waste. Do NOT try to dismantle the system yourself: dismantling the system, treatment of the refrigerant, of oil and of other parts MUST be done by an authorised installer and MUST comply with applicable legislation.

Units MUST be treated at a specialised treatment facility for reuse, recycling and recovery. By ensuring this product is disposed of correctly, you will help to prevent potential negative consequences for the environment and human health. For more information, contact your installer or local authority.

- Batteries are marked with the following symbol:



This means that the batteries may NOT be mixed with unsorted household waste. If a chemical symbol is printed beneath the symbol, this chemical symbol means that the battery contains a heavy metal above a certain concentration.

Possible chemical symbols are: Pb: lead (>0.004%).

Waste batteries MUST be treated at a specialised treatment facility for reuse. By ensuring waste batteries are disposed of correctly, you will help to prevent potential negative consequences for the environment and human health.

### 3.2 Instructions for safe operation

#### WARNING

Make sure installation, servicing, maintenance, repair and applied materials follow the instructions from Daikin (including all documents listed in “Documentation set”) and, in addition, comply with applicable legislation and are performed by qualified persons only. In Europe and areas where IEC standards apply, EN/IEC 60335-2-40 is the applicable standard.

#### WARNING

Do NOT install operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) in the ductwork.

#### 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.

#### CAUTION

Do NOT operate the system when using a room fumigation-type insecticide. Chemicals could collect in the unit, and endanger the health of people who are hypersensitive to chemicals.

#### CAUTION

It is unhealthy to expose your body to the air flow for a long time.

#### WARNING

This unit contains electrical and hot parts.

#### WARNING

Before operating the unit, be sure the installation has been carried out correctly by an installer.

Maintenance and service (see ["7 Maintenance and service"](#) [p 14])

#### WARNING

The unit is equipped with a refrigerant leak detection system for safety. To be effective, the unit MUST be electrically powered at all times after installation, except for maintenance.

#### 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.

#### WARNING

If the supply cord is damaged, it MUST be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

### 3 User safety instructions

#### 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.

Make 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.

About the refrigerant (see "7.2 About the refrigerant" [p 14])

#### A2L **WARNING: MILDLY FLAMMABLE MATERIAL**

The refrigerant inside this unit is mildly flammable.

#### WARNING

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

#### WARNING

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

#### WARNING

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

After-sales service and warranty (see "7.3 After-sales service" [p 14])

#### WARNING

- Do NOT modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electrical shock or fire. Contact your dealer.
- In case of accidental refrigerant leaks, make sure there are no naked flames. The refrigerant itself is entirely safe, non-toxic and mildly flammable, but it will generate toxic gas when it accidentally leaks into a room where combustible air from fan heaters, gas cookers, etc. is present. Always have qualified service personnel confirm that the point of leakage has been repaired or corrected before resuming operation.

Troubleshooting (see "8 Troubleshooting" [p 14])

#### 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, electrical shock or fire. Contact your dealer.

#### WARNING

The unit is equipped with a refrigerant leak detection system for safety.

To be effective, the unit MUST be electrically powered at all times after installation, except for maintenance.

#### CAUTION

NEVER expose little children, plants or animals directly to the airflow.

## CAUTION

Do NOT touch the heat exchanger fins. These fins are sharp and could result in cutting injuries.

## 4 About the system

The VRV 5-S uses R32 refrigerant which is rated as A2L and is mildly flammable. For compliance with the requirements for enhanced tightness refrigerating systems and IEC60335-2-40 the installer must take extra measures. For more information, see "2.1 Instructions for equipment using R32 refrigerant" [p 8].

The indoor unit part of this VRV 5-S heat pump system can be used for heating/cooling applications. The type of indoor unit which can be used depends on the outdoor units series.

### WARNING

- Do NOT modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electrical shock or fire. Contact your dealer.
- In case of accidental refrigerant leaks, make sure there are no naked flames. The refrigerant itself is entirely safe, non-toxic and mildly flammable, but it will generate toxic gas when it accidentally leaks into a room where combustible air from fan heaters, gas cookers, etc. is present. Always have qualified service personnel confirm that the point of leakage has been repaired or corrected before resuming operation.

### WARNING

The unit is equipped with a refrigerant leak detection system for safety.  
To be effective, the unit MUST be electrically powered at all times after installation, except for short service periods.

### 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, food, plants, animals, or works of art.

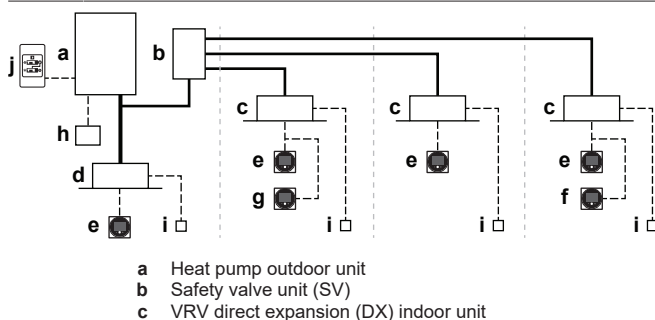
### NOTICE

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.

## 4.1 System layout

### INFORMATION

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



- d VRV direct expansion (DX) indoor unit (direct connection from outdoor to indoor)
- e Remote controller in **normal mode**
- f Remote controller in **alarm only mode**
- g Remote controller in **supervisor mode** (mandatory in some situations)
- h Centralised controller (optional)
- i Option PCB (optional)
- j Cool/heat changeover remote control switch (optional)
- Refrigerant piping
- - - Interconnection and user interface wiring
- Direct connection of indoor units to the outdoor unit

## 5 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 offers a non-exhaustive overview of the main functions of the system.

Detailed information on required actions to achieve certain functions can be found in the dedicated installation and operation manual of the indoor unit.

Refer to the operation manual of the installed user interface.

## 6 Operation

### 6.1 Operation range

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

	Cooling	Heating
Outdoor temperature	-5~52°C DB	-20~21°C DB -20~15.5°C WB
Indoor temperature	21~32°C DB 14~25°C WB	15~27°C DB
Indoor humidity	≤80% <sup>(a)</sup>	

<sup>(a)</sup> To avoid condensation and water dripping out of the unit. If the temperature or the humidity is beyond these conditions, safety devices may be put in action and the air conditioner may not operate.

Above operation range is only valid in case direct expansion indoor units are connected to the VRV 5-S system.

Special operation ranges are valid in case of using AHU. They can be found in the installation/operation manual of the dedicated unit. Latest information can be found in the technical engineering data.

## 6 Operation

### 6.2 Operating the system

#### 6.2.1 About operating the system

- Operation procedure varies according to the combination of outdoor unit and user interface.
- To protect the unit, turn on the main power switch 6 hours before operation.
- If the main power supply is turned off during operation, operation will restart automatically after the power turns back on again.

#### 6.2.2 About cooling, heating, fan only, and automatic operation

- Changeover cannot be made with a user interface whose display shows "changeover under centralised control" (refer to installation and operation manual of the user interface).
- When the display flashes, refer to "6.5.1 About setting the master user interface" [p. 13].
- The fan may keep on running for about 1 minute after the heating operation stops.
- The air flow rate may adjust itself depending on the room temperature or the fan may stop immediately. This is not a malfunction.

#### 6.2.3 About the heating operation

It may take longer to reach the set temperature for general heating operation than for cooling operation.

The following operation is performed in order to prevent the heating capacity from dropping or cold air from blowing.

##### Defrost operation

In heating operation, freezing of the outdoor unit's air cooled coil increases over time, restricting the energy transfer to the outdoor unit's coil. Heating capability decreases and the system needs to go into defrost operation to be able to remove frost from the outdoor unit's coil. During defrost operation the heating capacity on the indoor unit side will temporarily drop until defrosting is completed. After defrosting, the unit will regain its full heating capacity.

The indoor unit will stop fan operation, the refrigerant cycle will reverse and energy from inside the building will be used to defrost the outdoor unit coil.

The indoor unit will indicate defrost operation on the display .

##### Hot start

In order to prevent cold air from blowing out of an indoor unit at the start of heating operation, the indoor fan is automatically stopped. The display of the user interface shows . It may take some time before the fan starts. This is not a malfunction.

#### 6.2.4 To operate the system (WITHOUT cool/heat changeover remote control switch)

- 1 Press the operation mode selector button on the user interface several times and select the operation mode of your choice.

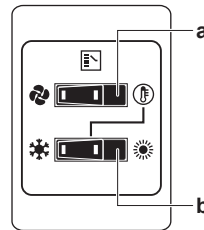
- Cooling operation
- Heating operation
- Fan only operation

- 2 Press the ON/OFF button on the user interface.

**Result:** The operation lamp lights up and the system starts operating.

#### 6.2.5 To operate the system (WITH cool/heat changeover remote control switch)

##### Overview of the changeover remote control switch



- a** FAN ONLY/AIR CONDITIONING SELECTOR SWITCH

Set the switch to for fan only operation or to for heating or cooling operation.

- b** COOL/HEAT CHANGEOVER SWITCH

Set the switch to for cooling or to for heating

**Note:** In case a cool/heat changeover remote control switch is used, the position of DIP switch 1 (DS1-1) on the main PCB needs to be switched to the ON position.

##### To start

- 1 Select operation mode with the cool/heat changeover switch as follows:

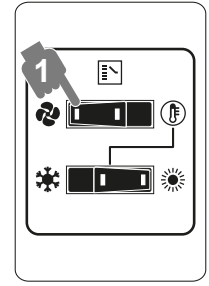
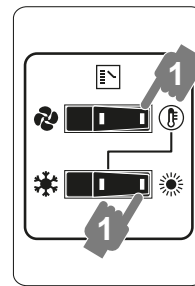
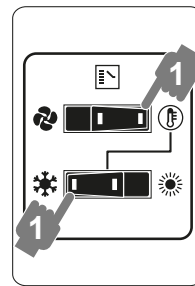
Cooling operation



Heating operation



Fan only operation



- 2 Press the ON/OFF button on the user interface.

**Result:** The operation lamp lights up and the system starts operating.

##### To stop

- 3 Press the ON/OFF button on the user interface once again.

**Result:** The operation lamp goes out and the system stops operating.



##### NOTICE

Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

##### To adjust

For programming temperature, fan speed and air flow direction refer to the operation manual of the user interface.


## 6.3 Using the dry program

### 6.3.1 About the dry program

- The function of this program is to decrease the humidity in your room with minimal temperature decrease (minimal room cooling).
- The micro computer automatically determines temperature and fan speed (cannot be set by the user interface).
- The system does not go into operation if the room temperature is low (<20°C).

### 6.3.2 To use the dry program (WITHOUT cool/heat changeover remote control switch)

#### To start

- 1 Press the operation mode selector button on the user interface several times and select  (program dry operation).
- 2 Press the ON/OFF button of the user interface.  
**Result:** The operation lamp lights up and the system starts operating.
- 3 Press the air flow direction adjust button (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted). Refer to "6.4 Adjusting the air flow direction" [p 13] for details.

#### To stop

- 4 Press the ON/OFF button on the user interface once again.

**Result:** The operation lamp goes out and the system stops operating.



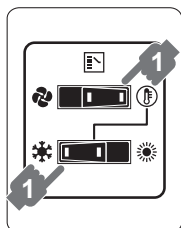
#### NOTICE


Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

### 6.3.3 To use the dry program (WITH cool/heat changeover remote control switch)

#### To start

- 1 Select cooling operation mode with the cool/heat changeover remote control switch.



- 2 Press the operation mode selector button on the user interface several times and select  (program dry operation).
- 3 Press the ON/OFF button of the user interface.

**Result:** The operation lamp lights up and the system starts operating.

- 4 Press the air flow direction adjust button (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted). Refer to "6.4 Adjusting the air flow direction" [p 13] for details.

#### To stop

- 5 Press the ON/OFF button on the user interface once again.

**Result:** The operation lamp goes out and the system stops operating.



#### NOTICE


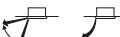
Do not turn off power immediately after the unit stops, but wait for at least 5 minutes.

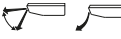
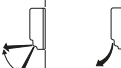
## 6.4 Adjusting the air flow direction

Refer to the operation manual of the user interface.

### 6.4.1 About the air flow flap

Air flow flap types:



-  Double flow + multi-flow units
-  Corner units

-  Ceiling suspended units
-  Wall-mounted units

For the following conditions, a micro computer controls the air flow direction which may be different from the display.

Cooling	Heating
<ul style="list-style-type: none"> <li>• When the room temperature is lower than the set temperature.</li> </ul>	<ul style="list-style-type: none"> <li>• When starting heating operation.</li> <li>• When the room temperature is higher than the set temperature.</li> <li>• At defrost operation.</li> </ul>
<ul style="list-style-type: none"> <li>• When operating continuously at horizontal air flow direction.</li> <li>• When continuous operation with downward air flow is performed at the time of cooling with a ceiling-suspended or a wall-mounted unit, the micro computer may control the flow direction, and then the user interface indication will also change.</li> </ul>	

The air flow direction can be adjusted in one of the following ways:

- The air flow flap itself adjusts its position.
- The air flow direction can be fixed by the user.
- Automatic  and desired position .




#### WARNING

NEVER touch the air outlet or the horizontal blades while the swing flap is in operation. Fingers may become caught or the unit may break down.



#### NOTICE

- The movable limit of the flap is changeable. Contact your dealer for details. (only for double-flow, multi-flow, corner, ceiling-suspended and wall-mounted).
- Avoid operating in the horizontal direction . It may cause dew or dust to settle on the ceiling or flap.

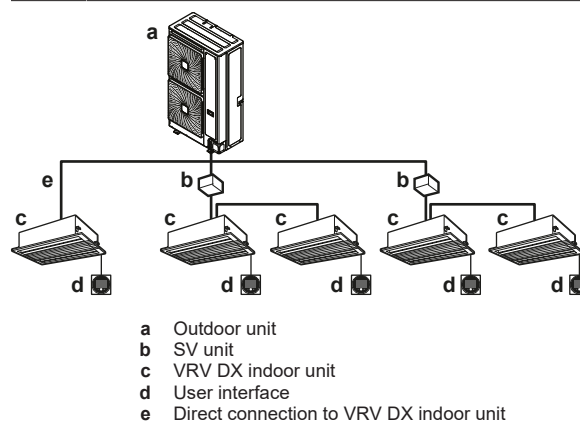
## 6.5 Setting the master user interface

### 6.5.1 About setting the master user interface




#### INFORMATION

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



When the system is installed as shown in the figure above, it is necessary to – for each subsystem – designate one of the user interfaces as the master user interface.

The displays of slave user interfaces show  (changeover under centralised control) and slave user interfaces automatically follow the operation mode directed by the master user interface.




## 7 Maintenance and service


Only the master user interface can select heating or cooling mode (cooling/heating masterhood).


### 6.5.2 To designate the master user interface

- 1 Press the operation mode selector button of the current master user interface for 4 seconds. In case this procedure was not yet performed, the procedure can be executed on the first user interface operated.

**Result:** The display showing  (changeover under centralised control) of all slave user interfaces connected to the same outdoor unit flashes.

- 2 Press the operation mode selector button of the controller that you wish to designate as the master user interface.

**Result:** Designation is completed. This user interface is designated as the master user interface and the display showing  (changeover under centralised control) vanishes.

The displays of other user interfaces show  (changeover under centralised control).

Refer to the operation manual of the user interface.

## 7 Maintenance and service

### 7.1 Precautions for maintenance and service



#### CAUTION

See "3 User safety instructions" [▶ 8] to acknowledge all related safety instructions.



#### NOTICE

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



#### NOTICE

Do NOT wipe the controller operation panel with benzene, thinner, chemical dust cloth, etc. The panel may get discoloured or the coating peeled off. If it is heavily dirty, soak a cloth in water-diluted neutral detergent, squeeze it well and wipe the panel clean. Wipe it with another dry cloth.

### 7.2 About the refrigerant



#### CAUTION

See "3 User safety instructions" [▶ 8] to acknowledge all related safety instructions.

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

Refrigerant type: R32

Global warming potential (GWP) value: 675

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



#### NOTICE

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

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

Contact your installer for more information.

## 7.3 After-sales service

### 7.3.1 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.



#### WARNING

- Do NOT modify, disassemble, remove, reinstall or repair the unit yourself as incorrect dismantling or installation may cause an electrical shock or fire. Contact your dealer.
- In case of accidental refrigerant leaks, make sure there are no naked flames. The refrigerant itself is entirely safe, non-toxic and mildly flammable, but it will generate toxic gas when it accidentally leaks into a room where combustible air from fan heaters, gas cookers, etc. is present. Always have qualified service personnel confirm that the point of leakage has been repaired or corrected before resuming operation.

## 8 Troubleshooting

If one of the following malfunctions occurs, 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, electrical 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.
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 operate properly except for the above mentioned cases and none of the above mentioned malfunctions is evident, investigate the system in accordance with the following procedures.

Malfunction	Measure
If a refrigerant leak occurs (error code <i>RQ1CH</i> )	<ul style="list-style-type: none"> <li>Actions will be taken by the system. Do NOT turn OFF the power supply.</li> <li>Notify your installer and report the malfunction code.</li> </ul>
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  on the home screen. Refer to the installation and operation manual delivered with the indoor unit.</li> </ul>
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 "Maintenance" in the indoor unit manual).</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>

After checking all the items above, if 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.

### 8.1 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>RQ</i>	External protection device was activated
<i>RQ-11</i>	The R32 sensor in one of the indoor units has detected a refrigerant leak <sup>(a)</sup>
<i>RQ-20</i>	The R32 sensor in one of the SV unit has detected a refrigerant leak.
<i>RQ1CH</i>	Safety system error (leak detection) <sup>(a)</sup>
<i>R1</i>	EEPROM failure (indoor)
<i>R3</i>	Drain system malfunction (indoor/SV unit)
<i>R5</i>	Fan motor malfunction (indoor)
<i>R7</i>	Swing flap motor malfunction (indoor)

Main code	Contents
<i>R9</i>	Expansion valve malfunction (indoor)
<i>RF</i>	Drain malfunction (indoor unit)
<i>RH</i>	Filter dust chamber malfunction (indoor)
<i>RJ</i>	Capacity setting malfunction (indoor)
<i>C1</i>	Transmission malfunction between main PCB and sub PCB (indoor)
<i>C4</i>	Heat exchanger thermistor malfunction (indoor; liquid)
<i>C5</i>	Heat exchanger thermistor malfunction (indoor; gas)
<i>C9</i>	Suction air thermistor malfunction (indoor)
<i>CR</i>	Discharge air thermistor malfunction (indoor)
<i>CE</i>	Movement detector or floor temperature sensor malfunction (indoor)
<i>CH-01</i>	R32 sensor malfunction in one of the indoor units <sup>(a)</sup>
<i>CH-02</i>	R32 sensor end of lifetime in one of the indoor units <sup>(a)</sup>
<i>CH-05</i>	R32 sensor end of lifetime<6 months in one of the indoor units <sup>(a)</sup>
<i>CH-10</i>	Waiting for indoor unit R32 sensor replacement input <sup>(a)</sup>
<i>CH-20</i>	Waiting for SV unit replacement input
<i>CH-21</i>	SV unit R32 sensor malfunction
<i>CH-22</i>	Less than 6 months before the SV unit R32 sensor end of lifetime
<i>CH-23</i>	SV unit R32 sensor end of lifetime
<i>CJ</i>	User interface thermistor malfunction (indoor)
<i>E1</i>	PCB malfunction (outdoor)
<i>E2</i>	Current leakage detector was activated (outdoor)
<i>E3</i>	High pressure switch was activated
<i>E4</i>	Low pressure malfunction (outdoor)
<i>E5</i>	Compressor lock detection (outdoor)
<i>E7</i>	Fan motor malfunction (outdoor)
<i>E9</i>	Electronic expansion valve malfunction (outdoor)
<i>ER-27</i>	SV unit damper malfunction
<i>F3</i>	Discharge temperature malfunction (outdoor)
<i>F4</i>	Abnormal suction temperature (outdoor)
<i>H3</i>	High pressure switch malfunction
<i>H7</i>	Fan motor malfunction (outdoor)
<i>H9</i>	Ambient temperature sensor malfunction (outdoor)
<i>J3</i>	Discharge temperature sensor malfunction (outdoor)
<i>J5</i>	Suction temperature sensor malfunction (outdoor)
<i>J6</i>	De-icing temperature sensor malfunction (outdoor) or heat exchanger gas temperature sensor malfunction (outdoor)
<i>J7</i>	Liquid temperature sensor (after subcool HE) malfunction (outdoor)
<i>J8</i>	Liquid temperature sensor (coil) malfunction (outdoor)
<i>J9</i>	Gas temperature sensor (after subcool HE) malfunction (outdoor)
<i>JA</i>	High pressure sensor malfunction (S1NPH)
<i>JL</i>	Low pressure sensor malfunction (S1NPL)
<i>L1</i>	INV PCB abnormal
<i>L4</i>	Fin temperature abnormal
<i>L5</i>	INV PCB abnormal
<i>LB</i>	Compressor over current detected
<i>L9</i>	Compressor lock (startup)
<i>LC</i>	Transmission outdoor unit - inverter: INV transmission trouble
<i>P1</i>	INV unbalanced power supply voltage



## 8 Troubleshooting

Main code	Contents
P4	Fin thermistor malfunction
PJ	Capacity setting malfunction (outdoor)
U0	Abnormal low pressure drop, faulty expansion valve
U1	Reversed power supply phase malfunction
U2	INV voltage power shortage
U3	System test run not yet executed
U4	Faulty wiring indoor/SV unit/outdoor
U5	Abnormal user interface - indoor communication
U7	Faulty wiring to outdoor/outdoor
U9	Warning because there is an error on another unit (indoor/SV unit)
UR	Connection malfunction over indoor units or type mismatch
UR-55	System lock
UR-57	External ventilation input error
UC	Centralised address duplication
UE	Malfunction in communication centralised control device - indoor unit
UF	Faulty wiring indoor/SV unit
UH	Auto address malfunction (inconsistency)
UJ-37	Airflow rate below the legal limit (for EKEA/EKVDX)

<sup>(e)</sup> The error code is only shown on the user interface of the indoor unit where the error occurs.



### 8.2 Symptoms that are NOT system malfunctions

The following symptoms are NOT system malfunctions:

#### 8.2.1 Symptom: The system does not operate

- The air conditioner does not start immediately after the ON/OFF button on the user interface is pressed. If the operation lamp lights, the system is in normal condition. To prevent overloading of the compressor motor, the air conditioner starts 5 minutes after it is turned ON again in case it was turned OFF just before. The same starting delay occurs after the operation mode selector button was used.
- If "Under Centralised Control" is displayed on the user interface, pressing the operation button causes the display to blink for a few seconds. The blinking display indicates that the user interface cannot be used.
- The system does not start immediately after the power supply is turned on. Wait one minute until the microcomputer is prepared for operation.

#### 8.2.2 Symptom: Cool/Heat cannot be changed over

- When the display shows  (changeover under centralised control), it shows that this is a slave user interface.
- When the cool/heat changeover remote control switch is installed and the display shows  (changeover under centralised control), this is because cool/heat changeover is controlled by the cool/heat changeover remote control switch. Ask your dealer where the remote control switch is installed.

#### 8.2.3 Symptom: Fan operation is possible, but cooling and heating do not work

Immediately after the power is turned on. The micro computer is getting ready to operate and is performing a communication check with the indoor unit(s). Please wait 12 minutes maximally until this process is finished.

#### 8.2.4 Symptom: The fan speed does not correspond to the setting

The fan speed does not change even if the fan speed adjustment button is pressed. During heating operation, when the room temperature reaches the set temperature, the outdoor unit goes off and the indoor unit changes to whisper fan speed. This is to prevent cold air blowing directly on occupants of the room. The fan speed will not change even when another indoor unit is in heating operation, if the button is pressed.

#### 8.2.5 Symptom: The fan direction does not correspond to the setting

The fan direction does not correspond with the user interface display. The fan direction does not swing. This is because the unit is being controlled by the micro computer.

#### 8.2.6 Symptom: White mist comes out of a unit (Indoor unit)

- When humidity is high during cooling operation. If the interior of an indoor unit is extremely contaminated, the temperature distribution inside a room becomes uneven. It is necessary to clean the interior of the indoor unit. Ask your dealer for details on cleaning the unit. This operation requires a qualified service person.
- Immediately after the cooling operation stops and if the room temperature and humidity are low. This is because warm refrigerant gas flows back into the indoor unit and generates steam.

#### 8.2.7 Symptom: White mist comes out of a unit (Indoor unit, outdoor unit)

When the system is changed over to heating operation after defrost operation. Moisture generated by defrost becomes steam and is exhausted.

#### 8.2.8 Symptom: The user interface reads "U4" or "U5" and stops, but then restarts after a few minutes

This is because the user interface is intercepting noise from electric appliances other than the air conditioner. The noise prevents communication between the units, causing them to stop. Operation automatically restarts when the noise ceases. A power reset may help to remove this error.

#### 8.2.9 Symptom: Noise of air conditioners (Indoor unit)

- A "zeen" sound is heard immediately after the power supply is turned on. The electronic expansion valve inside an indoor unit starts working and makes the noise. Its volume will reduce in about one minute.
- A continuous low "shah" sound is heard when the system is in cooling operation or at a stop. When the drain pump (optional accessories) is in operation, this noise is heard.
- A "pishi-pishi" squeaking sound is heard when the system stops after heating operation. Expansion and contraction of plastic parts caused by temperature change make this noise.

- A low "sah", "choro-choro" sound is heard while the indoor unit is stopped. When another indoor unit is in operation, this noise is heard. In order to prevent oil and refrigerant from remaining in the system, a small amount of refrigerant is kept flowing.

### 8.2.10 Symptom: Noise of air conditioners (Indoor unit, outdoor unit)

- A continuous low hissing sound is heard when the system is in cooling or defrost operation. This is the sound of refrigerant gas flowing through both indoor and outdoor units.
- A hissing sound which is heard at the start or immediately after stopping operation or defrost operation. This is the noise of refrigerant caused by flow stop or flow change.

### 8.2.11 Symptom: Noise of air conditioners (Outdoor unit)

When the tone of operating noise changes. This noise is caused by the change of frequency.

### 8.2.12 Symptom: Dust comes out of the unit

When the unit is used for the first time in a long time. This is because dust has gotten into the unit.

### 8.2.13 Symptom: The units can give off odours

The unit can absorb the smell of rooms, furniture, cigarettes, etc., and then emit it again.

### 8.2.14 Symptom: The outdoor unit fan does not spin

During operation, the speed of the fan is controlled in order to optimise product operation.

### 8.2.15 Symptom: The compressor in the outdoor unit does not stop after a short heating operation

This is to prevent refrigerant from remaining in the compressor. The unit will stop after 5 to 10 minutes.

### 8.2.16 Symptom: The inside of an outdoor unit is warm even when the unit has stopped

This is because the crankcase heater is warming the compressor so that the compressor can start smoothly.

### 8.2.17 Symptom: Hot air can be felt when the indoor unit is stopped

Several different indoor units are being run on the same system. When another unit is running, some refrigerant will still flow through the unit.

## 9 Relocation

Contact your dealer to remove and reinstall the entire unit. Moving units requires technical expertise.

## 10 Disposal

This unit uses hydrofluorocarbon. Contact your dealer when discarding this unit. It is required by law to collect, transport and discard the refrigerant in accordance with the "hydrofluorocarbon collection and destruction" regulations.



### 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.

## For the installer

## 11 About the box

Keep the following in mind:

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

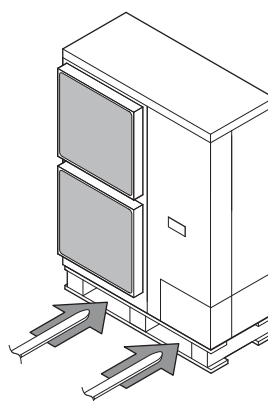
### 11.1 To handle the outdoor unit



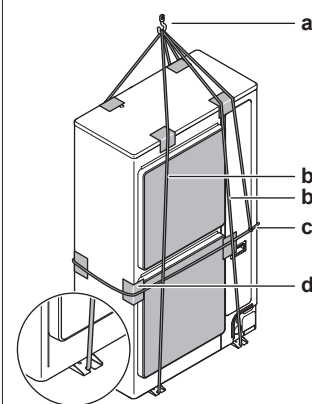
#### CAUTION

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

**Forklift.** If the unit remains on its pallet, you can also use a forklift.



**Crane.** For 10+12 HP models, you can also use a crane and lift the unit as follows:



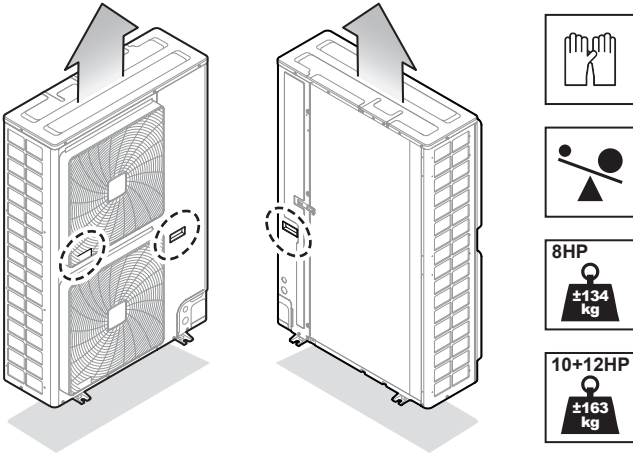
- a Lifting hook
- b Two vertical ropes (at least 8 m and Ø20 mm) to lift the unit
- c One horizontal rope (also fixed to the lifting hook) to prevent the unit from dropping
- d Protective material (rags, soft material) between the ropes and the casing to protect the casing

## 12 About the units and options

### WARNING

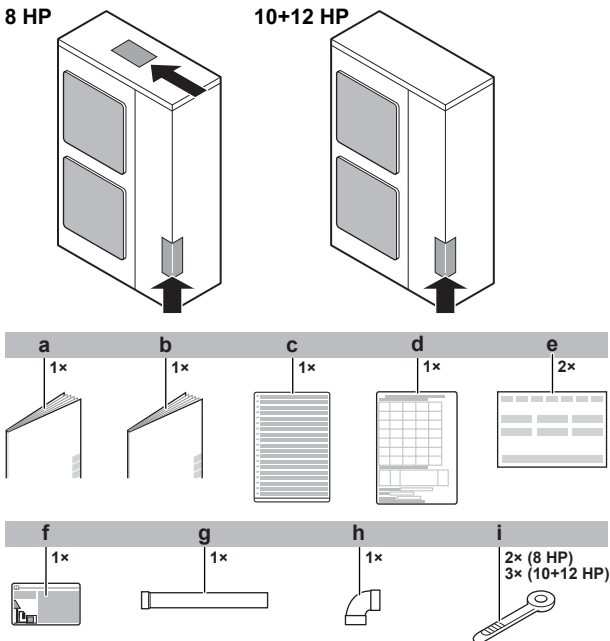
The unit's center of gravity deviates to the right side (compressor side). If you lift the unit using a crane and you do not fix a horizontal rope to the lifting hook as shown, the unit might drop.

Carry the unit slowly as shown:



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

- 1 Remove the service cover. See "14.2.1 To open the outdoor unit" [p 28].
- 2 Remove the accessories.



- a General safety precautions
- b Outdoor unit installation and operation manual
- c Multilingual fluorinated greenhouse gases label
- d Installation information leaflet
- e Declaration of conformity
- f Fluorinated greenhouse gases label
- g Gas piping accessory 1 (only for 10 HP: Ø19.1 mm)
- h Gas piping accessory 2 (8 HP: Ø19.1 mm; 10+12 HP: Ø22.2 mm)
- i Cable tie (8 HP: 2x; 10+12 HP: 3x)

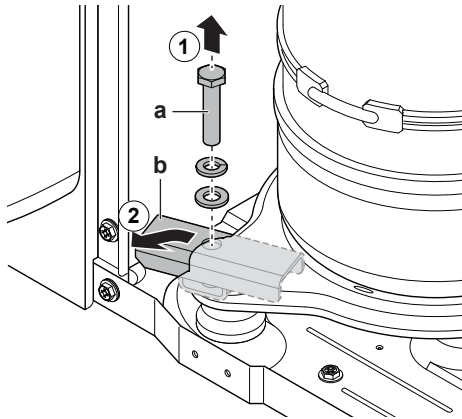
### 11.3 To remove the transportation stay

#### NOTICE

If the unit is operated with the transportation stay attached, abnormal vibration or noise may be generated.

The transportation stay for protecting the unit during transport must be removed. Proceed as shown in the figure and procedure below.

- 1 Remove the bolt (a) and washers.
- 2 Remove the transportation stay (b) as shown in the figure below.



- a Bolt
- b Transportation stay

## 12 About the units and options

### 12.1 About the outdoor unit

This installation manual concerns the VRV 5-S, full inverter driven, heat pump system.

These units are intended for outdoor installation and aimed for air to air heat pump applications.

Specification		
Capacity	Heating	25~37.5 kW
	Cooling	22.4~33.5 kW
Ambient design temperature	Heating	-20~21°C DB -20~15.5°C WB
	Cooling	-5~52°C DB

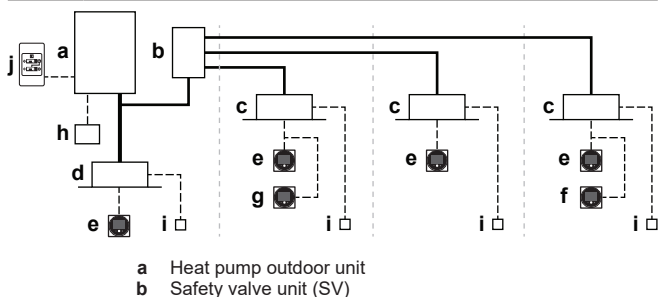
### 12.2 System layout

#### WARNING

The installation MUST comply with the requirements that apply to this R32 equipment. For more information, see "13 Special requirements for R32 units" [p 19].

#### INFORMATION

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



- a Heat pump outdoor unit
- b Safety valve unit (SV)

- c VRV direct expansion (DX) indoor unit
- d VRV direct expansion (DX) indoor unit (direct connection from outdoor to indoor)
- e Remote controller in **normal mode**
- f Remote controller in **alarm only mode**
- g Remote controller in **supervisor mode** (mandatory in some situations)
- h Centralised controller (optional)
- i Option PCB (optional)
- j Cool/heat changeover remote control switch (optional)
- Refrigerant piping
- Interconnection and user interface wiring
- Direct connection of indoor units to the outdoor unit

## 13 Special requirements for R32 units

### 13.1 Installation space requirements



#### WARNING

If the appliance contains R32 refrigerant, the floor area of the room in which the appliance is stored shall be at least 429 m<sup>2</sup>.



#### NOTICE

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

### 13.2 System layout requirements

The VRV 5-S uses R32 refrigerant which is rated as A2L and is mildly flammable.

To comply with the requirements of enhanced tightness refrigerating systems of the IEC 60335-2-40, this system is equipped with an alarm in the remote controller and shut-off valves in the SV unit. Both safety measures are installation specific and can be determined using the requirements mentioned in this manual. The SV unit is prearranged for a ventilated enclosure as countermeasure. In case the requirements of this manual are followed, no additional safety measures are needed.

A big range of charge and room area combinations is allowed thanks to the countermeasures that are implemented in the system by default.

Follow the installation requirements below to ensure that the complete system is compliant to legislation.

#### Outdoor unit installation

The outdoor unit must be installed outside. For indoor installation of the outdoor unit, additional measures can be necessary to comply with the applicable legislation.

A terminal for external output is available in the outdoor unit. This SVS output can be used when additional countermeasures are needed. The SVS output is a contact on terminal X2M that closes in case a leak is detected, failure or disconnection of an R32 sensor (located in the indoor unit or SV unit).

For more information about the SVS output, see "17.5 To connect the external outputs" [p 40].

#### Indoor unit installation



#### NOTICE

If one or more rooms are connected to the unit using a duct system, make sure air inlet AND outlet are connected directly to the same room by ducting. Do NOT use spaces such as a false ceiling as a duct for the air inlet or outlet.

For installation of the indoor unit, refer to the installation and operation manual delivered with the indoor unit. For compatibility of indoor units refer to the latest version of the technical data book of this unit.

Depending on the room size in which the indoor unit is installed and the total amount of refrigerant in the system, other safety measures are necessary for indoor units. See "13.3 To determine the required safety measures" [p 20].

An optional output PCB for the indoor unit can be added to provide output for external device. The output PCB will trigger in case a leak is detected, the R32 sensor fails or when the sensor is disconnected. For exact model name see option list of the indoor unit. For more information about this option, refer to the installation manual of the optional output PCB.

#### Piping requirements



#### CAUTION

Piping MUST be installed according to instructions given in "15 Piping installation" [p 29]. Only mechanical joints (e.g. braze+flare connections) that are compliant with the latest version of ISO14903 can be used.

Low temperature solder alloys shall not be used for pipe connections.

For piping installed in the occupied space, make sure that the piping is protected against accidental damage. Piping should be checked according to the procedure as mentioned in "15.3 Checking the refrigerant piping" [p 34].

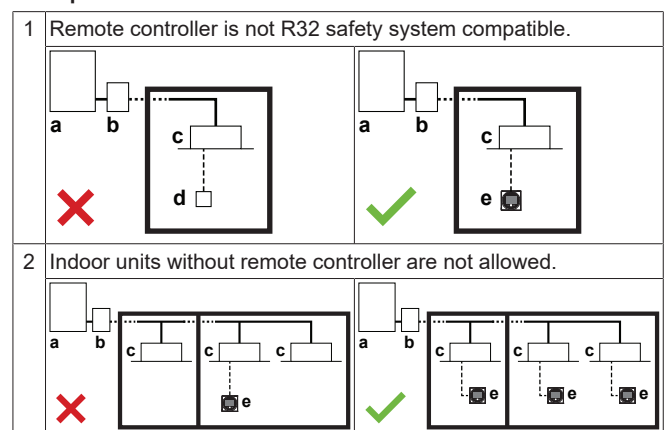
#### Remote controller requirements

For installation of the remote controller, please refer to the installation and operation manual delivered with the remote controller. Each indoor unit must be connected with a R32 safety system compatible remote controller (e.g. BRC1H52/82\* or later type). These remote controllers have implemented safety measures that will warn the user visually and audibly in case of a leak.

For installation of the remote controller, it is mandatory to follow the requirements.

- 1 Only a safety system compatible remote controller can be used. See technical data sheet for remote controller compatibility (e.g. BRC1H52/82\*).
- 2 Each indoor unit must be connected to a separate remote controller. In case indoor units are operating under group control, it is possible to use one remote controller.

#### Examples

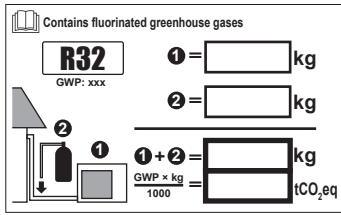


- a Outdoor unit
- b SV unit
- c Indoor unit
- d Remote controller NOT compatible with R32 safety system
- e Remote controller compatible with R32 safety system
- ✗ NOT allowed
- ✓ Allowed

# 13 Special requirements for R32 units

## 13.3 To determine the required safety measures

**Step 1** – Determine the total amount of refrigerant in the system. Use the values on the unit nameplate to determine the total amount of refrigerant in the system.



Total charge = Factory charge ①<sup>(a)</sup> + additional charge ②<sup>(b)</sup>

- <sup>(a)</sup> The factory charge value can be found on the nameplate.
- <sup>(b)</sup> The R value (additional refrigerant to be charged) is calculated in "16.2 To determine the additional refrigerant amount" [p. 36].

### NOTICE

The total refrigerant charge amount in the system **MUST** always be lower than 79.8 kg.

**Step 2** – Determine the smallest area out of:

- The room where an indoor unit is installed
- Each of the rooms served by a ducted indoor unit installed in a different room

The room area can be determined by projecting the walls, doors and partitions to the floor and calculating the enclosed area. Spaces connected by only false ceilings, ductwork, or similar connections are not considered a single space.

**Step 3** – Use the graphs or tables (see "Figure 4" [p. 3]) at the beginning of this manual) to determine the required safety measures for the indoor unit.

- m** Total refrigerant charge in the system [kg]
- A<sub>min</sub>** Minimum room area [m<sup>2</sup>]
- (a)** Lowest underground floor (=Lowest underground floor)
- (b)** All other floors (=All other floors)
- (c)** No safety measure (=No safety measure)
- (d)** Alarm OR Natural ventilation (=Alarm OR Natural ventilation)
- (e)** NOT allowed (=NOT allowed)
- (f)** Alarm + shut-off valve [SV unit] OR Alarm + natural ventilation (=Alarm + shut-off valve [SV unit] OR Alarm + natural ventilation)

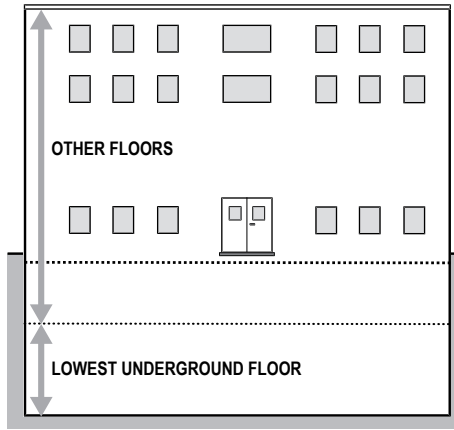
Use the total amount of refrigerant in the system and the smallest area of the room in which the indoor unit is installed/conditioning to check which safety measure is required.

**Note:** When "No safety measure" is required, it is still allowed to apply natural ventilation or alarm or shut-off valve (SV unit) if wanted. Follow the respective instructions as described further below.

**Note:** When natural ventilation is required, it is still allowed to apply alarm or shut-off valve (SV unit) if wanted. Follow the respective instructions as described further below.

**Note:** When alarm + natural ventilation is required as safety measure in other floors, it is also allowed to apply alarm + shut-off valve (SV unit). Follow the instructions described further below.

Use the first graph (Lowest underground floor<sup>(a)</sup>) in case the indoor unit is installed/conditioning in the lowest underground floor of a building. For other floors, use the second graph (All other floors<sup>(b)</sup>).



The graphs and table are based on an installation height of the indoor unit up to 2.2 m (bottom of the indoor unit or bottom of the duct openings). See "14.1.1 Installation site requirements of the outdoor unit" [p. 27].

If the installation height is more than 2.2 m, different boundaries for the applicable safety measures can apply. To know which safety measure is required in case the installation height is more than 2.2 m, refer to the online tool (VRV Xpress).

### NOTICE

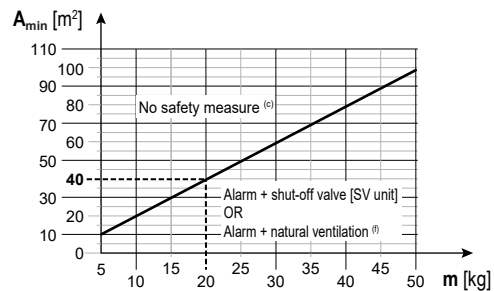
Indoor units and the bottom of duct openings cannot be installed lower than 1.8 m from the lowest point of the floor, except for floor standing indoor units (e.g. FXNA).

### Example

The total amount of refrigerant in the VRV system is 20 kg. All indoor units are installed in spaces that do NOT belong to the lowest underground floor of the building. The space in which the first indoor unit is installed has a room area of 50 m<sup>2</sup>, the space in which the second indoor unit is installed has a room area of 15 m<sup>2</sup>.

- Based on the graph for "All other floors" (All other floors), the room area limit is 40 m<sup>2</sup> for No safety measure" (No safety measures).
- This means that the following safety measures are required:

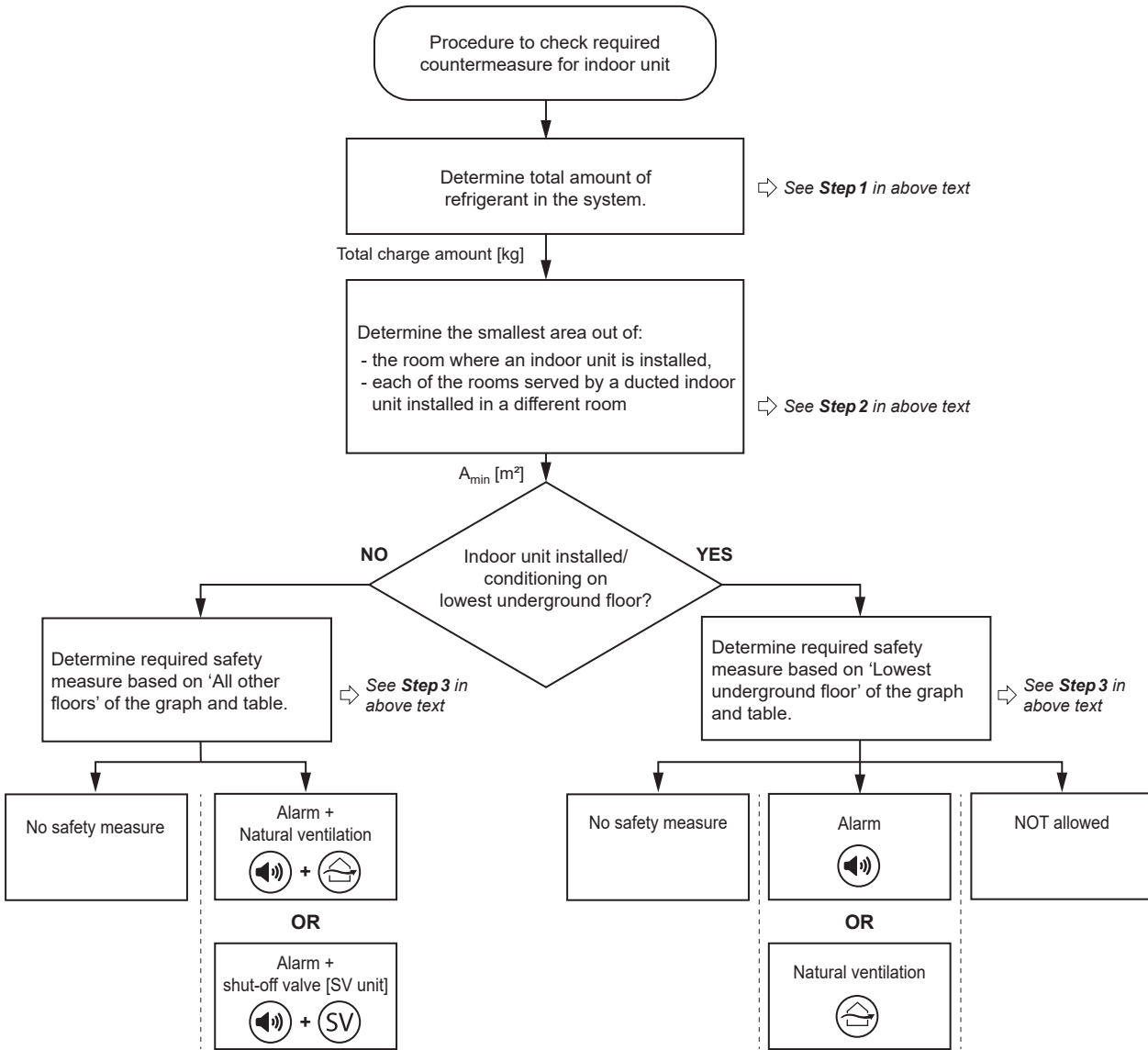
SV unit	Room area	Required safety measure
1	A=50 m <sup>2</sup> ≥ 40 m <sup>2</sup>	No safety measures
2	A=15 m <sup>2</sup> < 40 m <sup>2</sup>	Alarm + natural ventilation OR Alarm + shut-off valve (SV unit)



- m** Total refrigerant charge in the system [kg]
- A<sub>min</sub>** Minimum room area [m<sup>2</sup>]
- (a)** Lowest underground floor (=Lowest underground floor)
- (b)** All other floors (=All other floors)
- (c)** No safety measure (=No safety measure)
- (d)** Alarm OR Natural ventilation (=Alarm OR Natural ventilation)
- (e)** NOT allowed (=NOT allowed)
- (f)** Alarm + shut-off valve [SV unit] OR Alarm + natural ventilation (=Alarm + shut-off valve [SV unit] OR Alarm + natural ventilation)



13.3.1 Overview: flowchart



**Note:** The flowchart is an overview. Always refer to the full text mentioned in this manual for clear understanding and detailed explanation.

13.4 Safety measures

13.4.1 No safety measure

When the room area is sufficiently large, no safety measures are required. This also includes an indoor unit installed in the lowest underground floor.

Therefore the R32 safety system in the indoor unit in a sufficiently large room can be deactivated (active by default) by changing the setting in the user interface as shown below:

Field settings

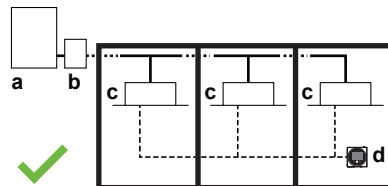
No safety measure				
Setting	1 <sup>st</sup> code	Function	2 <sup>nd</sup> code	Description
15/25	13	R32 leak safety system setting	01	Disabled

**Note:** For more information, see "18.1.8 Indoor unit field setting" [p 44].

**WARNING**  
Deactivating the setting (15/25) is NOT allowed for floor standing indoor units (e.g. FXNA).

Group control

Group control is allowed up to a maximum of 10 indoor units connected to different ports or connected to the same port:



- a Outdoor unit
  - b SV unit
  - c Indoor units with no safety measure
  - d Remote controller compatible with R32 safety system
- ✓ Allowed

## 13 Special requirements for R32 units

### 13.4.2 Alarm



#### WARNING

Do NOT use 'Alarm' as the ONLY safety measure in case the indoor unit is installed in an occupied space where people are restricted in their movement. Combine or use another safety measure.

R32 safety system compatible remote controllers (e.g. BRC1H52/82\* or later type) used with the indoor units have a built-in alarm as a safety measure. For installation of the remote controller, please refer to the installation and operation manual delivered with the remote controller.

Each indoor unit must be connected with a R32 safety system compatible remote controller (e.g. BRC1H52/82\* or later type). These remote controllers have implemented safety measures that will warn the user visually and audibly in case of a leak.

For installation of the remote controller, it is mandatory to follow the requirements.

- 1 Only a safety system compatible remote controller can be used. See technical data sheet for remote controller compatibility (e.g. BRC1H52/82\*).
- 2 Each indoor unit must be connected to a separate remote controller. In case indoor units are operating under group control, it is possible to only use one remote controller per room.
- 3 The remote controller put in the room served by the indoor unit must be in 'fully functional' or 'alarm only' mode. In case the indoor unit is serving a different room than where it is installed, a remote controller is required in both installed and served room. For details about the different remote controller modes and how to set up, please check the note below or refer to the installation and operation manual delivered with the remote controller.
- 4 For buildings where sleeping facilities are offered (e.g. hotel), where persons are restricted in their movements (e.g. hospitals), an uncontrolled number of persons is present or buildings where people are not aware of the safety precautions it is mandatory to install one of the following devices at a location with 24-hour monitoring:
  - a supervisor remote controller
  - or a centralised controller. E.g., iTM with external alarm via WAGO module, iTM with built-in alarm, ...

**Note:** The remote controllers with built-in alarm will generate a visible and audible warning. E.g. the BRC1H52/82\* remote controllers can generate an alarm of 65 dB (sound pressure, measured at 1 m distance of the alarm). Sound data is available in the technical data sheet of the remote controller. **The alarm should always be 15 dB louder than the background noise of the room.**

A field supply external alarm with a sound output 15 dB louder than the background noise of the room MUST be installed in the following cases:

- The sound output of the remote controller is not sufficient to guarantee the 15 dB difference. This alarm can be connected to the SVS output channel of the outdoor unit or the SV unit, or to the optional output PCB of the indoor unit of that specific room. The outdoor SVS will trigger for any R32 leak detected in the complete system. For SV units and indoor units, SVS is only triggered when its own R32 sensor detects a leak. For more information on the SVS output signal, see ["17.5 To connect the external outputs"](#) [▶ 40].
- A centralised controller without built-in alarm is used, or the sound output of the centralised controller with built-in alarm is not sufficient to guarantee the 15 dB difference. Please refer to the installation manual of the centralised controller for the correct procedure to install the external alarm.

**Note:** Depending on configuration, the remote controller is operable in three possible modes. Each mode offers different controller functionality. For detailed information about setting the operation mode of the remote controller and its function, please refer to the installer and user reference guide of the remote controller.

Mode	Function
Fully functional	The controller is fully functional. All normal functionality is available. <b>This controller can be master or slave.</b>
Alarm only	The controller only acts as leak detection alarm (for a single indoor unit). No functionality is available. The remote controller should always be put in the same room as the indoor unit. <b>This controller can be master or slave.</b>
Supervisor	The controller only acts as leak detection alarm (for the whole system, i.e. multiple indoor units and their respective controllers). No other functionality is available. The remote controller should be placed at a supervised location. <b>This remote controller can only be the slave.</b>  <b>Note:</b> In order to add a supervisor remote controller to the system, a field setting must be set on remote controller and outdoor unit. Indoor units and SV units need to be assigned an address number.

**Note:** Incorrect use of remote controllers can result in occurrence of error codes, non-operating system or system that is not compliant to applicable legislation.

**Note:** Some centralised controllers can also be used as supervisor remote controller. For further details on installation, please refer to the installation manual of the centralised controllers.

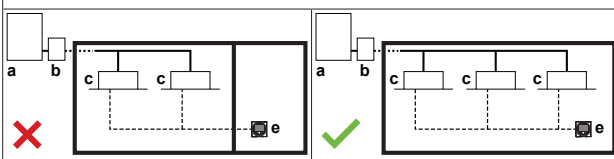
#### Examples

1	In case of one R32 safety system compatible remote controller, it should be the master and in the same room of the indoor unit.
2	In case a ducted indoor unit serves a different room than where it is installed, both supply and return air MUST be directly ducted to that room.  The room area and remote controller rules MUST be followed for both installed and served room.
3	In case of two R32 safety system compatible remote controllers, at least one remote controller should be in the room of the indoor.

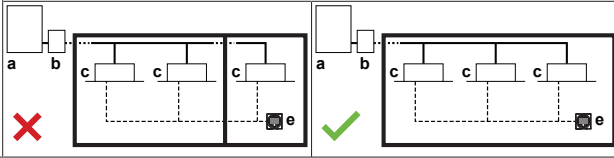


## 13 Special requirements for R32 units

4 Group control is allowed up to a maximum of 10 indoor units connected to different ports or connected to the same port. At least one R32 safety system compatible remote controller should be in the room of the indoors.

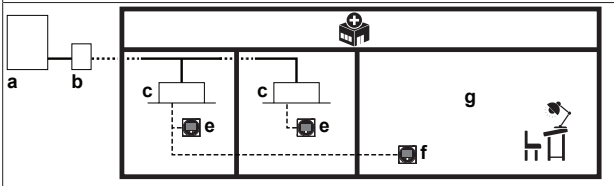


5 All indoor units under group control need to be conditioning the same room.



6 A remote controller installed at a supervised location:

- In room: master remote controller in fully functional OR alarm only
- In supervisor room: supervisor remote controller



- a Outdoor unit  
 b SV unit  
 c Indoor unit  
 d Remote controller NOT compatible with R32 safety system  
 e Remote controller compatible with R32 safety system  
 f Remote controller in supervisor mode  
 g Supervisor room  
 x NOT allowed  
 ✓ Allowed

### 13.4.3 Natural ventilation

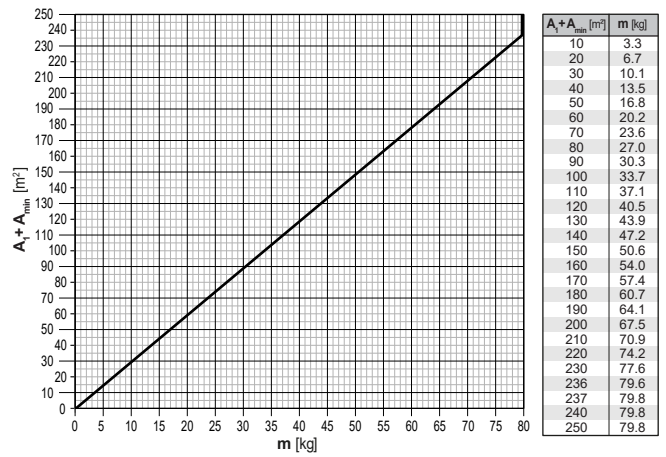
Natural ventilation is a safety measure where ventilation is made to a place where sufficient air is available to dilute the leaked refrigerant such as a large space.

The natural ventilation safety measure can be applied by following the steps below:

**Step 1** – Determine total room area, which is the total area of the space that has natural ventilation **and** the space in which the indoor unit is installed/conditioning:

The respective room area can be determined by projecting the walls, doors and partitions to the floor and calculating the enclosed area. Spaces connected only through false ceilings, ductwork, or similar connections are not considered a single space.

**Step 2** – Use the graph or table below to determine the total refrigerant charge limit:



- m Total refrigerant charge limit in the system [kg]  
 $A_1$  Area of the room with natural ventilation [m<sup>2</sup>]  
 $A_{min}$  Minimum room area of the space in which the indoor unit is installed/conditioning [m<sup>2</sup>]

**Note:** Round down the derived values.

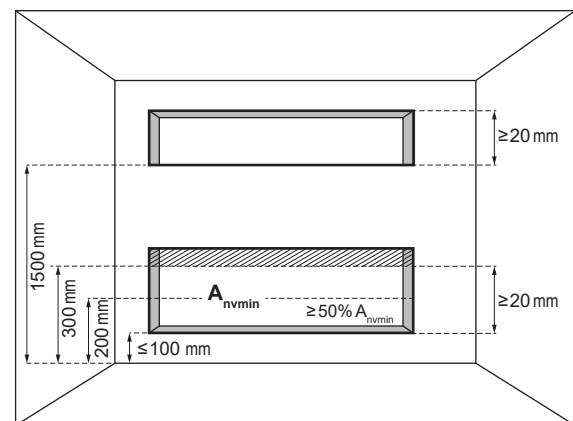
The graphs and table are based on an installation height of the indoor unit up to 2.2 m (bottom of indoor unit or bottom of duct openings).

If the installation height is more than 2.2 m, higher total refrigerant charge limit of the system can apply. To know the total refrigerant charge limit of the system in case the installation height is more than 2.2 m, refer to the online tool ([VRV Xpress](#)).

**Step 3** – The total amount of refrigerant in the system **MUST** be less than the refrigerant charge limit derived from the graph above. If **NOT**, natural ventilation safety measure is not allowed.

**Step 4** – The partition between two rooms on the same floor **MUST** meet one of the following two requirements for natural ventilation.

- 1 Rooms on the same floor that are connected with a permanent opening that extends to the floor and is intended for people to walk through.
- 2 Rooms on the same floor connected with permanent openings that fulfil the requirements listed below. The openings must consist out of two parts to allow air circulation for natural ventilation.



$A_{nvmin}$  Minimal natural ventilation area

For the lower opening:

- It is not an opening to the outside
- The opening cannot be closed
- The opening must be  $\geq 0.012 \text{ m}^2$  ( $A_{nvmin}$ )
- The area of any openings above 300 mm from the floor does not count when determining  $A_{nvmin}$
- At least 50% of  $A_{nvmin}$  is less than 200 mm above the floor
- The bottom of the lower opening is  $\leq 100 \text{ mm}$  from the floor
- The height of the opening is  $\geq 20 \text{ mm}$

## 13 Special requirements for R32 units

For the upper opening:

- It is not an opening to the outside
- The opening cannot be closed
- The opening must be  $\geq 0.006 \text{ m}^2$  (50% of  $A_{\text{rmin}}$ )
- The bottom of the upper opening must be  $\geq 1500 \text{ mm}$  above the floor
- The height of the opening is  $\geq 20 \text{ mm}$

**Note:** The requirement for the upper opening can be met by false ceilings, ventilation ducts or similar arrangements that provide an airflow path between the connected rooms.



### NOTICE

Indoor units and the bottom of duct openings cannot be installed lower than 1.8 m from the lowest point of the floor, except for floor standing indoor units (e.g. FXNA)

### Example

The total amount of refrigerant in the VRV system is 20 kg. The VRV system has two indoor units which are installed in a space that does not belong to the lowest underground floor of the building. The space in which the indoor units are installed has a room area of 25 m<sup>2</sup>. An adjacent room has a room area of 45 m<sup>2</sup> to which air circulation is possible through a partition that meets one of the two requirements in the above text. The safety measure chosen is *Alarm + Natural ventilation* (based on the total amount of refrigerant and room area from the graph for "All other floors").

- To apply the *Alarm* safety measure, see "13.4.2 Alarm" [p 22].
- In addition, apply the *Natural ventilation* safety measure: total room areas of installed room and adjacent room where natural ventilation can be made:  $25 \text{ m}^2 + 45 \text{ m}^2 = 70 \text{ m}^2$

**Result:** Total refrigerant charge limit for the system determined using the graph for natural ventilation is **23.6 kg**.

Total amount of refrigerant in the system (20 kg) < Total refrigerant charge limit (23.6 kg), which means that the safety measure can be applied.

### 13.4.4 Shut-off valves

In case shut-off valves are required as a safety measure, SV unit which has shut-off valves needs to be installed to reduce the amount of refrigerant leakage in to the room where the indoor unit is installed.

For installation of the SV unit, refer to the installation and operation manual delivered with the SV unit.

The maximum amount of charge limit and so the maximum capacity class of indoor unit which is allowed to install in the room is determined as below.

### About the charge limit

The charge limit must be determined separately for **each SV unit branch pipe port**.

This is possible because of the shut-off valves in the SV unit. The maximum amount of refrigerant that can escape in case of a leak is determined by the piping length and indoor heat exchanger size. This is directly linked to the downstream indoor unit capacity of this piping section.

In case a leak is detected in an indoor unit, the shut-off valves in the SV unit of the respective port will close. The piping section with the leak is now shut off from the rest of the system and the amount of refrigerant that can leak is significantly reduced.

**Note:** When two branch pipe ports are combined in order to form a single branch pipe port (e.g. FXMA200/250), they must be considered as a single branch pipe port.

### To determine the charge limit

**Step 1** – Determine the smallest area out of:

- Each of the rooms served by SV unit branch pipe port where an indoor unit is installed
- Each of the rooms served by a ducted indoor unit installed in a different room

The room area can be determined by projecting the walls, doors and partitions to the floor and calculate the enclosed area. Spaces connected by only false ceilings, ductwork, or similar connections are NOT considered a single space.

The area of the smallest room calculated above is used in the next step to determine the maximum allowable indoor capacity that can be connected to that port.

**Step 2** – Use the table below to determine the maximum total indoor unit capacity (sum of all connected indoor units) that is allowed for a single SV unit branch pipe port. In case a ducted indoor unit is serving a different room than where it is installed, the restrictions of the room area apply to both the indoor installation room and the conditioned room separately. Supply and return air shall be directly ducted to that room.

Area of installed/conditioned room [m <sup>2</sup> ]	Maximum total indoor unit capacity class		
	1 indoor unit per branch pipe port <sup>(a)</sup>	2-5 indoor units per branch pipe port	
		40 m after 1 <sup>st</sup> branch <sup>(b)</sup>	90 m after 1 <sup>st</sup> branch <sup>(c)</sup>
<5	—	—	—
5	10	—	—
6	25	—	—
7	32	—	—
8	40	—	—
9	71	—	—
10	80	—	—
11	80	20	—
12	80	25	—
13	80	32	—
14	80	32	—
15	125	40	—
20	200	50	40
25	250	71	71
30	250	125	125
35	250	200	200
40	250	200	200
≥45	250	250	250

<sup>(a)</sup> One indoor unit connected to a single branch pipe port.

<sup>(b)</sup> Two to five indoor units connected to a single branch pipe port, 40 m after first refrigerant branch.

<sup>(c)</sup> Two to five indoor units connected to a single branch pipe port, 90 m after first refrigerant branch (size-up of liquid pipe, see "15.1 Preparing refrigerant piping" [p 29]).

### Notes:

- The values in the table are under the assumption of worst case indoor unit volume and 40 m piping between indoor and SV unit and an installation height up to 2.2 m (bottom of indoor unit or bottom of duct openings). In *VRV Xpress* it is possible to add custom piping lengths, installation heights above 2.2 m and custom indoor units which can lead to lower minimum room area requirements.
- In case the capacity class allowed per branch pipe port is bigger than 140, use SV1A unit or combine two ports while using SV4~8A. For more information and installation of the SV unit, please refer to the installation and operation manual delivered with the SV unit.
- In case multiple indoor units are connected to the same branch pipe port, the sum of the connected indoor unit capacity classes needs to be equal or less than the value indicated in the table.
- In case indoor units connected to the same branch pipe port are split over different rooms, the area of the smallest room needs to be considered.
- Round down the derived values.

## 13 Special requirements for R32 units

**Step 3** – The total indoor capacity connected to a branch pipe port (or pair of branch pipe ports in case of FXMA200/250) **MUST** be equal or less than the capacity limit that is derived from the table.

If NOT, change the installation and repeat all of the above steps.

Possible changes:

- Increase the area of smallest room (installed & conditioned) connected to the same branch pipe port.
- Reduce the indoor capacity connected to the same branch pipe port to equal or below the limit.
- Split indoor capacity over two separate branch pipe ports.
- Fine tune system with more detailed calculations in [VRV Xpress](#).

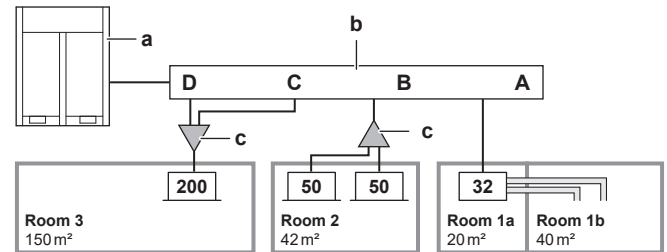
### Example

VRV system serving three rooms via one SV unit. Room 1 (20 m<sup>2</sup>) is served by one indoor unit (32 class) connected to port **A**. Room 2 (42 m<sup>2</sup>) is served by two indoor units (2×50 class) connected to port **B** (no extension and liquid pipe size up has been done). Room 3 (150 m<sup>2</sup>) is served by one indoor unit (200 class) connected to ports **C** and **D**.

Port **A** is connected to an indoor unit installed in room 1a, that is serving a different room (room 1b) than where it is installed. The smallest room size needs to be considered: 20 m<sup>2</sup>. Use the table under **Step 2** to find the maximum capacity class limit of the indoor unit: 140. The selected indoor unit is 32 → **OK**.

Port **B** only serves room 2: use the table under **Step 2** to find the maximum capacity class limit of the sum of the indoor units. 42 m<sup>2</sup> is rounded down to 40 m<sup>2</sup>: 200. The sum of both indoor units is exactly 100 → **OK**.

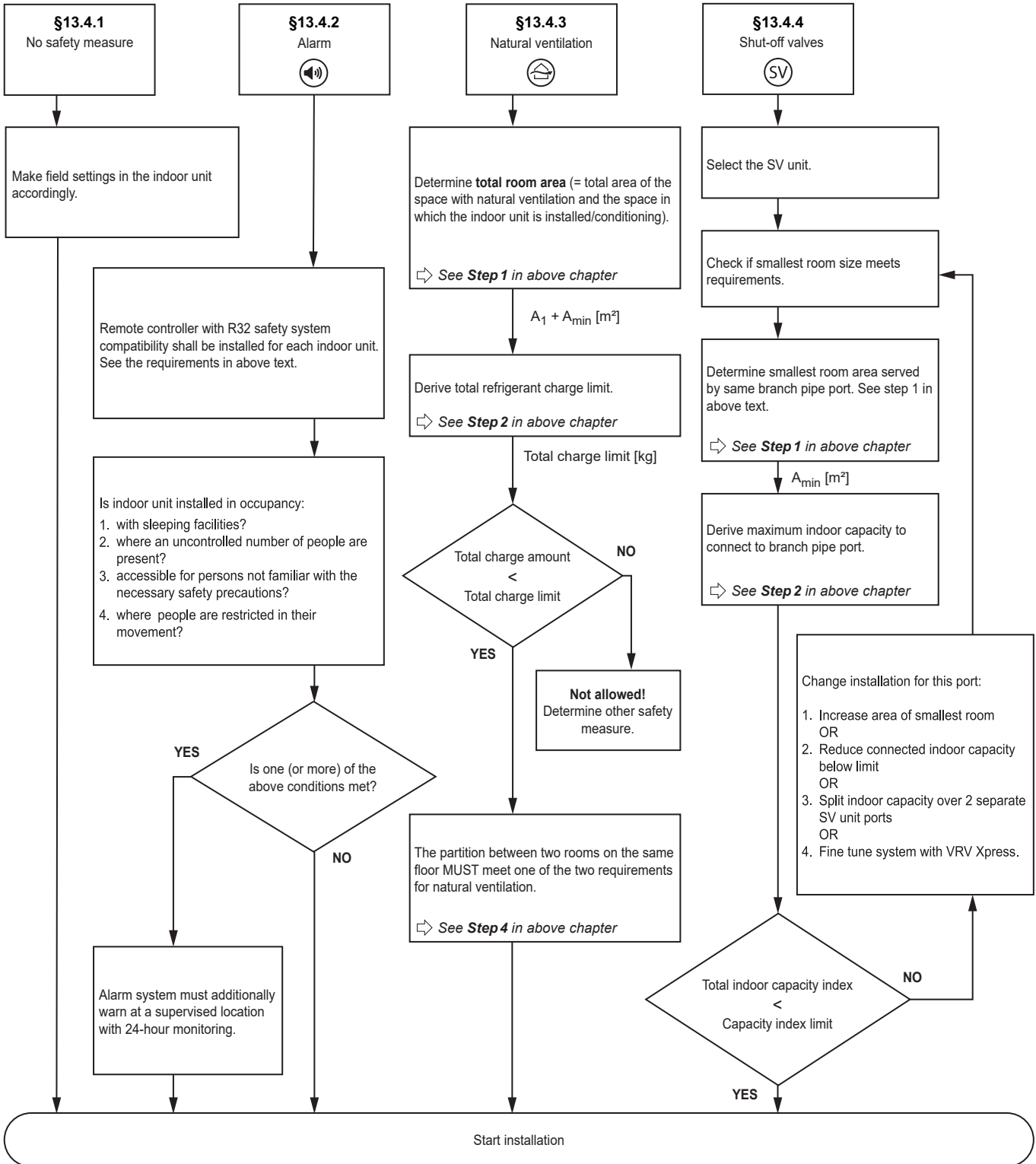
Ports **C** and **D** are combined and must be considered as one branch pipe. They only serve room 3: Use the table under **Step 2** to find the maximum capacity class limit of the indoor unit: 250. The selected indoor unit is 200 → **OK**.



<b>A~D</b>	Branch pipe port A~D
<b>a</b>	Outdoor unit
<b>b</b>	SV unit
<b>c</b>	Indoor branch kit (refnet)
<b>Room</b>	Room
<b>32/50/200</b>	Indoor unit capacity

# 13 Special requirements for R32 units

## 13.4.5 Overview: flowchart

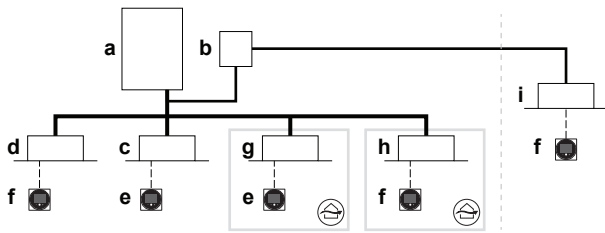


**Note:** The flowchart is an overview. Always refer to the full text mentioned in this manual for clear understanding and detailed explanation.

### 13.5 Combinations of safety measures

It is possible to combine indoor units with different safety measures (no safety measures, alarm and/or natural ventilation, alarm and shut-off valves) in the same system.

**Example**



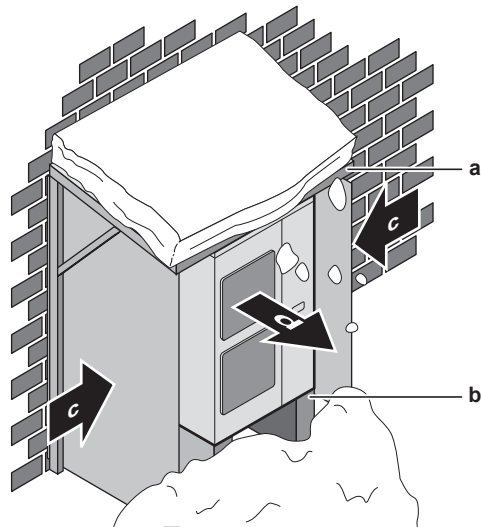
- a Heat pump outdoor unit
- b Safety valve unit (SV)
- c Indoor unit with no safety measure
- d Indoor unit with alarm safety measure
- e Remote controller in normal mode (R32 safety deactivated)
- f Remote controller in normal mode (R32 safety activated)
- g Indoor unit with natural ventilation safety measure
- h Indoor unit with alarm + natural ventilation safety measure
- i Indoor unit with alarm + shut-off valves safety measure
- Refrigerant piping
- - - Interconnection and user interface wiring
- Direct connection of indoor units to the outdoor unit

Heating	-20~21°C DB -20~15.5°C WB
Cooling	-5~52°C DB

**Note:** For indoor installation of the outdoor unit, check the applicable legislation.

### 14.1.2 Additional installation site requirements of the outdoor unit in cold climates

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



- a Snow cover or shed
- b Pedestal (minimum height=150 mm)
- c Prevailing wind direction
- d Air outlet

Snow might build up and freeze between the heat exchanger and the casing of the unit. This might decrease the operating efficiency. For instructions on how to prevent this (after mounting of the unit), see "14.3.3 To provide drainage" [p 28].

## 14 Unit installation



**WARNING**

The installation **MUST** comply with the requirements that apply to this R32 equipment. For more information, see "13 Special requirements for R32 units" [p 19].

### 14.1 Preparing the installation site



**WARNING**

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



**WARNING**

The appliance shall be stored/installed as follows:

- in such a way as to prevent mechanical damage.
- in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).
- in a room with dimensions as specified in "13 Special requirements for R32 units" [p 19].

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

Mind the spacing guidelines. See the "Technical data" chapter, and the figures on the inside of the front cover.



**INFORMATION**

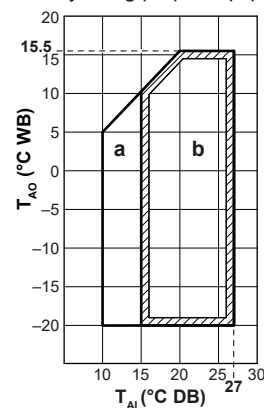
The sound pressure level is less than 70 dBA.

- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- The outdoor unit is designed for outdoor installation only, and for the following ambient temperatures:



**NOTICE**

When operating the unit **in heating** in a low outdoor ambient temperature with high humidity conditions, make sure to take precautions to keep the drain holes of the unit free by using proper equipment.



a: Warming up operation range; b: Heating operation range;  $T_{Ai}$ : Ambient indoor temperature;  $T_{Ao}$ : Ambient outdoor temperature

If the unit is selected to operate at ambient temperatures lower than  $-5^{\circ}\text{C}$  for 5 days or longer, with relative humidity levels exceeding 95%, we recommend to apply a Daikin range specifically designed for such application and/or to contact your dealer for further advice.

## 14 Unit installation

### 14.2 Opening and closing the unit

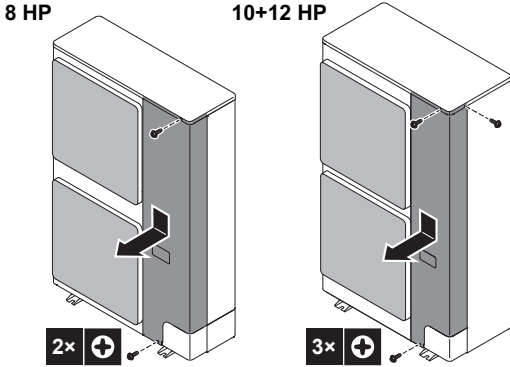
#### 14.2.1 To open the outdoor unit



**DANGER: RISK OF ELECTROCUTION**



**DANGER: RISK OF BURNING/SCALDING**

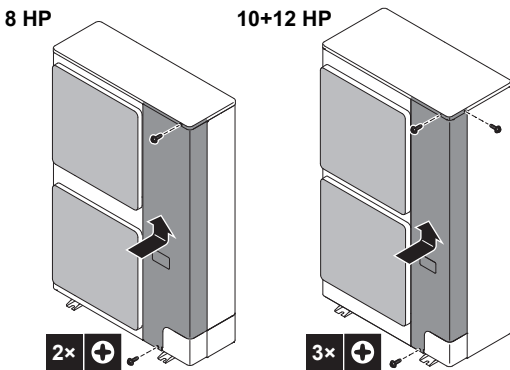


#### 14.2.2 To close the outdoor unit



**NOTICE**

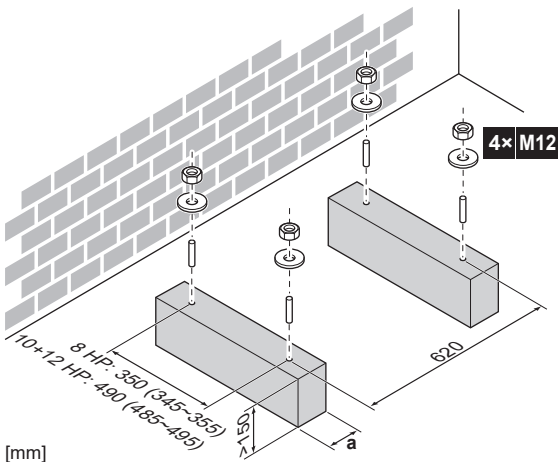
When closing the outdoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N·m.



### 14.3 Mounting the outdoor unit

#### 14.3.1 To provide the installation structure

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

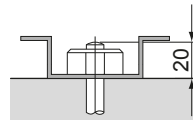


**a** Make sure not to cover the drain holes of the bottom plate of the unit.



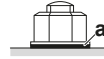
**INFORMATION**

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

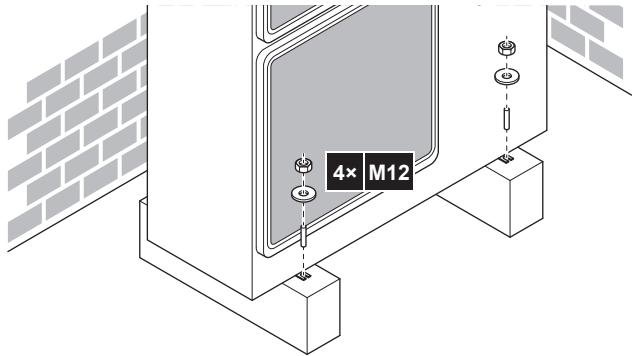


**NOTICE**

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



#### 14.3.2 To install the outdoor unit

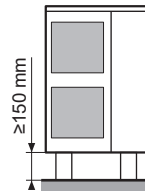


#### 14.3.3 To provide drainage



**NOTICE**

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



Drain holes (dimensions in mm)

Model	Bottom view [mm]
RXYS8	
RXYS10 + RXYS12	

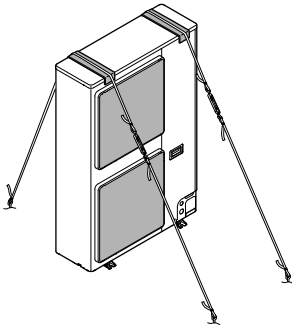
**a** Drain holes



## 14.3.4 To prevent the outdoor unit from falling over

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

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



## 15 Piping installation



### CAUTION

See "2 Specific installer safety instructions" [p. 5] to make sure this installation complies with all safety regulations.

## 15.1 Preparing refrigerant piping

### 15.1.1 Refrigerant piping requirements



### NOTICE

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

- Foreign materials inside pipes (including oils for fabrication) must be  $\leq 30$  mg/10 m.

### 15.1.2 Refrigerant piping material

#### Piping material

Phosphoric acid deoxidised seamless copper

#### Flare connections

Only use annealed material.

#### Piping temper grade and thickness

Outer diameter (Ø)	Temper grade	Thickness (t) <sup>(a)</sup>	
6.4 mm (1/4")	Annealed (O)	$\geq 0.80$ mm	
9.5 mm (3/8")			
12.7 mm (1/2")			
15.9 mm (5/8")	Annealed (O)	$\geq 0.99$ mm	
19.1 mm (3/4")	Half hard (1/2H)	$\geq 0.80$ mm	
22.2 mm (7/8")			
25.4 mm (1")	Half hard (1/2H)	$\geq 0.88$ mm	

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

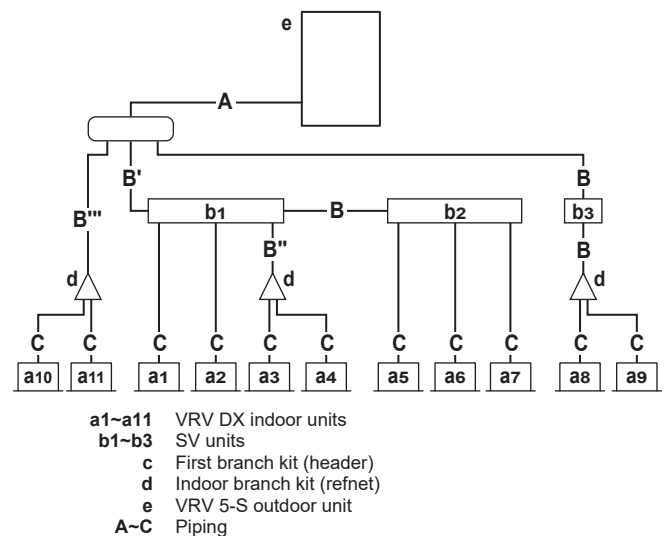
### 15.1.3 Refrigerant piping insulation

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

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

### 15.1.4 To select the piping size

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



### A: Piping between outdoor unit and (first) refrigerant branch kit

Choose from the following table in accordance with the outdoor unit capacity type. In case there is no first indoor branch kit (c), pipe A is connected to the first SV unit or VRV DX indoor unit.

HP class	Piping outer diameter [mm]	
	Gas pipe	Liquid pipe
8~10	19.1	9.5
12	22.2	12.7



## 15 Piping installation

### B: Piping between refrigerant branch kit and SV units OR between two refrigerant branch kits OR between two SV units

Choose from the following table in accordance with the indoor unit total capacity type, connected downstream. Do not let the connection piping exceed the refrigerant piping size chosen by the general system model name.

#### Example:

- Downstream capacity for B' = [capacity index of unit a1] + [unit a2] + [unit a3] + [unit a4] + [unit a5] + [unit a6] + [unit a7]
- Downstream capacity for B'' = [capacity index of unit a3] + [unit a4]
- Downstream capacity for B''' = [capacity index of unit a10] + [unit a11]

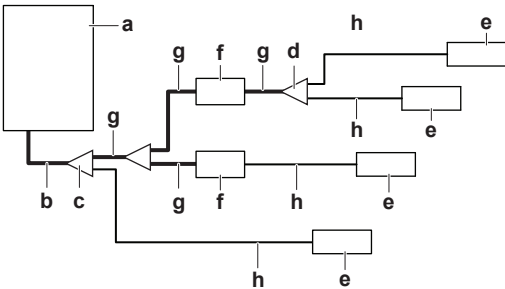
Indoor unit capacity index	Piping outer diameter [mm]	
	Gas pipe	Liquid pipe
<150	15.9	9.5
150≤x<290	19.1	
290≤x<390	22.2	12.7

### C: Piping between refrigerant branch kit or SV unit and indoor unit

Pipe size for direct connection to indoor unit must be the same as the connection size of the indoor unit (in case indoor unit is VRV DX indoor).

Indoor unit capacity index	Piping outer diameter [mm]	
	Gas pipe	Liquid pipe
10~32	9.5	6.4
40~80	12.7	
100~140	15.9	9.5
200~250	19.1	

### Size-up of piping



- a Outdoor unit
- b Main pipes (size up if equivalent length >90 m)
- c First refrigerant branch kit (refnet)
- d Last refrigerant branch kit (refnet)
- e Indoor unit
- f SV unit
- g Piping between first and last refrigerant branch kit (size-up may be required)
- h Piping between last refrigerant branch kit and indoor unit

If a size-up of the piping is required, refer to the table below:

Size up – outer diameter [mm]		
HP class	Gas piping	Liquid piping
8~10	19.1 → 22.2	9.5 → 12.7
12	22.2 → 25.4 <sup>(a)</sup>	12.7 → 15.9

<sup>(a)</sup> If the size-up size of 25.4 mm is NOT available, you must use the standard size. It is not allowed to size-up to 28.6 mm due to legal requirements.

- In case the required pipe sizes (inch sizes) are not available, it is also allowed to use other diameters (mm sizes), taken the following into account:

- Select the pipe size nearest to the required size.
- Use the suitable adapters for the changeover from inch to mm pipes (field supply).
- The additional refrigerant calculation has to be adjusted as mentioned in "16.2 To determine the additional refrigerant amount" [▶ 36].

- Size-up of both main pipes is required when the equivalent pipe length between outdoor and indoor units is 90 m or more.

### 15.1.5 To select refrigerant branch kits

#### Refrigerant refnets

For piping example, refer to "15.1.4 To select the piping size" [▶ 29].

- When using refnet joints at the first branch counted from the outdoor unit side, choose from the following table in accordance with the capacity of the outdoor unit (example: refnet joint c).

HP class	Refrigerant branch kit
8~12	KHRQ22M29T9 (inch)
	KHRQM22M29T (mm)

- For refnet joints other than the first branch, select the proper branch kit model based on the total capacity index of all indoor units connected after the refrigerant branch.

Indoor unit capacity index	Refrigerant branch kit
<200	KHRQ22M20TA (inch)
	KHRQM22M20T (mm)
200≤x<290	KHRQ22M29T9 (inch)
	KHRQM22M29T (mm)
290≤x<390	KHRA22M65T (inch)
	KHRAM22M65T (mm)

- Concerning refnet headers, choose from the following table in accordance with the total capacity of all the indoor units connected below the refnet header.

Indoor unit capacity index	Refrigerant branch kit
<290	KHRQ22M29H (inch)
	KHRQM22M29H9 (mm)
290≤x<390	KHRA22M65H (inch)
	KHRAM22M65H (mm)

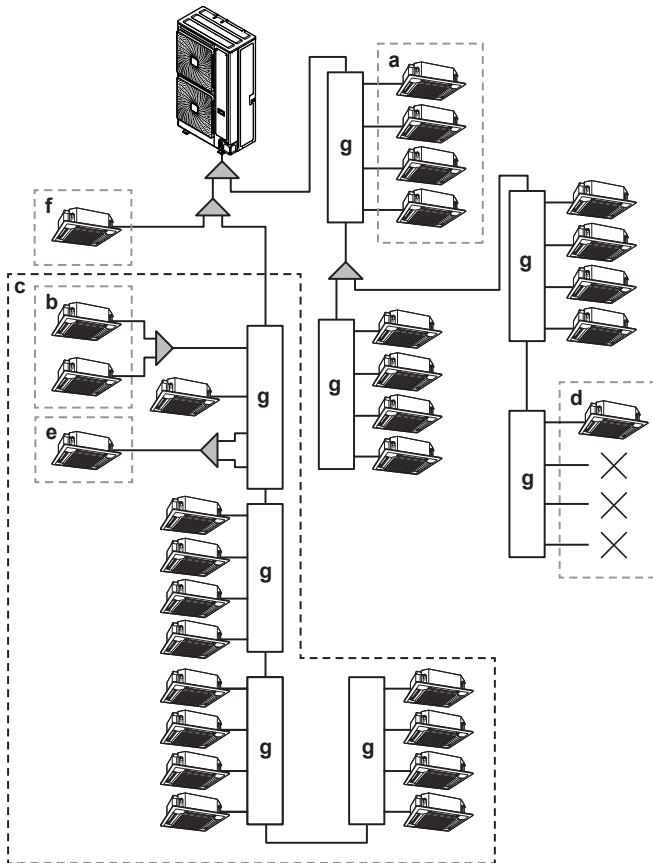


#### INFORMATION

Maximum 8 branches can be connected to a header.

15.1.6 Installation limitations

The illustration and table below show the installation limitations.



- a, b See table below.
- c Maximum limit of 16 downstream ports of SV units in refrigerant flow-through. Unused ports must also be counted. E.g. 16 ports=SV8A+SV4A+SV4A.
- d At least one indoor unit must be connected to a SV unit (SV6A and SV8A: always start from one of the first four ports).
- e Combine two ports when indoor unit capacity is over 140 except when SV1A is used. Refer to the table below.
- f Direct connection to the outdoor unit. For more information, see "15 Piping installation" [p 29].
- g SV unit

Description	Model			
	SV1	SV4	SV6	SV8
Maximum number of connectable indoor units per SV unit (a)	5	20	30	40
Maximum number of connectable indoor units per SV unit branch (b)	5			
Maximum capacity index of connectable indoor units per SV unit (a)	250	400	600	650
Maximum capacity index of connectable indoor units per branch (b)	250	140		
Maximum capacity index of connectable indoor units per branch if two branches are combined (e)	—	250		
Maximum capacity index of indoor units connected to SV units in refrigerant flow-through (c)	650			
Maximum number of allowable SV units in refrigerant flow-through (c)	4			
Maximum number of ports of SV units in refrigerant flow-through (c)	16			
Maximum number of indoor units connected to SV units in refrigerant flow-through (c)	64			

15.2 Connecting the refrigerant piping

15.2.1 Using the stop valve and service port

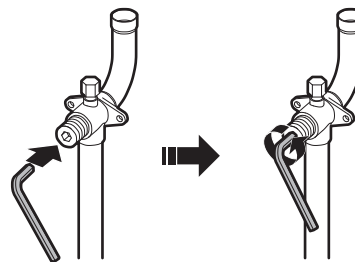
To handle the stop valve

Take the following guidelines into account:

- The gas and liquid stop valves are factory closed.
- Make sure to keep all stop valves open during operation.
- Do NOT apply excessive force to the stop valve. Doing so may break the valve body.

To open the stop valve

- 1 Remove the dust cap.
- 2 Insert a hexagon wrench into the stop valve.
- 3 FULLY turn the stop valve counterclockwise and tighten until the correct tightening torque value is achieved (see "Tightening torques" [p 32]).



NOTICE

Stop valves need to be opened on torque specified in this manual. It is not allowed to turn valve "a quarter turn" back when opening it.

- 4 Install the dust cap.

Result: The valve is now open.



NOTICE

Reinstall dust cap to prevent aging of O-ring and risk of leakage.

To close the stop valve

- 1 Remove the stop valve cover.
- 2 Insert a hexagon wrench into the stop valve and turn the stop valve clockwise.
- 3 When the stop valve cannot be turned any further, stop turning.
- 4 Install the stop valve cover.

Result: The valve is now closed.

To handle the service port

- 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.

# 15 Piping installation

## Tightening torques

Stop valve size [mm]	Tightening torque [N·m] <sup>(a)</sup>		
	Valve body	Hexagonal wrench	Service port
Ø9.5	5~7	4 mm	10.7~14.7
Ø12.7	8~10		
Ø15.9	14~16	6 mm	
Ø19.1	19~21	8 mm	
Ø25.4			

<sup>(a)</sup> When opening or closing.

### 15.2.2 To remove the pinched pipes



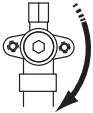
#### WARNING

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

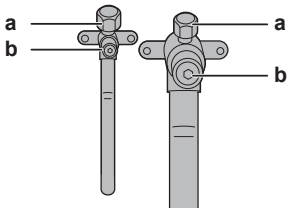
Failure to observe the instructions in procedure below properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Use the following procedure to remove the pinched piping:

- 1 Make sure that the stop valves are fully closed.



- 2 Connect the vacuuming/recovery unit through a manifold to the service port of all stop valves.



a Service port  
b Stop valve

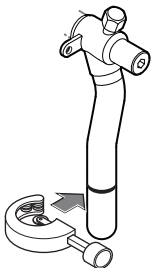
- 3 Recover gas and oil from the pinched piping by using a recovery unit.



#### 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 Cut off the lower part of the gas and liquid stop valve pipes along the black line. Use an appropriate tool (e.g. a pipe cutter).



#### WARNING



NEVER remove the pinched piping by brazing.

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

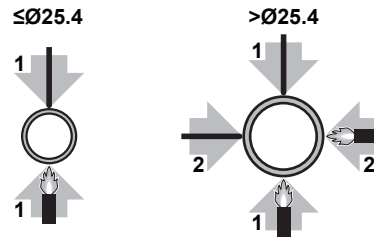
- 6 Wait until all oil has dripped out before continuing with the connection of the field piping in case the recovery was not complete.

### 15.2.3 To braze the pipe end

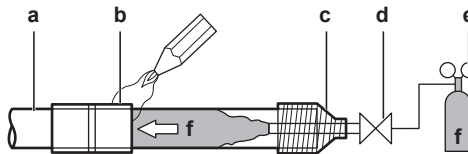


#### NOTICE

Precautions when connecting field piping. Add brazing material as shown in the figure.



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



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

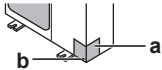
- Do NOT use anti-oxidants when brazing pipe joints. Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does NOT require flux. Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.
- ALWAYS protect the surrounding surfaces (e.g. insulation foam) from heat when brazing.

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

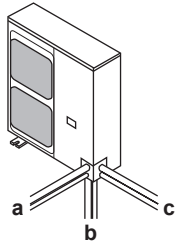
- **Piping length.** Keep field piping as short as possible.
- **Piping protection.** Protect the field piping against physical damage.

1 Do the following:

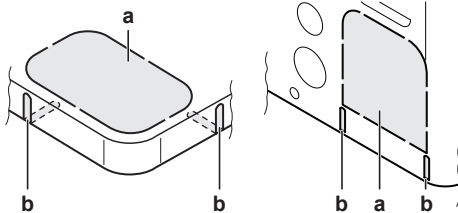
- Remove the service cover. See "14.2.1 To open the outdoor unit" [p. 28].
- Remove the piping intake plate (a) with screw (b).



2 Choose a piping route (a, b or c).



### **i** INFORMATION



- Punch out the knockout (a) in the bottom plate or cover plate by tapping on the attachment points with a flat head screwdriver and a hammer.
- Optionally, cut out the slits (b) with a metal saw.

### **!** NOTICE

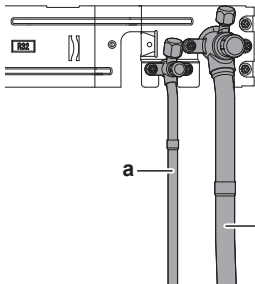
Precautions when making knockout holes:

- Avoid damaging the casing and underlying piping.
- After making the knockout holes, we recommend to 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.

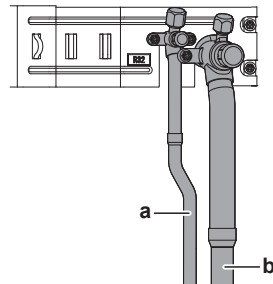
3 Do the following:

- Connect the liquid pipe (a) to the liquid stop valve. (brazing)
- Connect the gas pipe (b) to the gas stop valve. (brazing)

8 HP

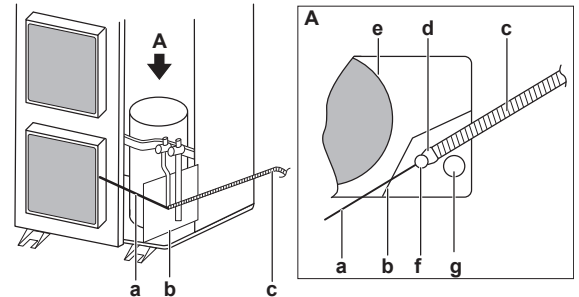


10-12 HP



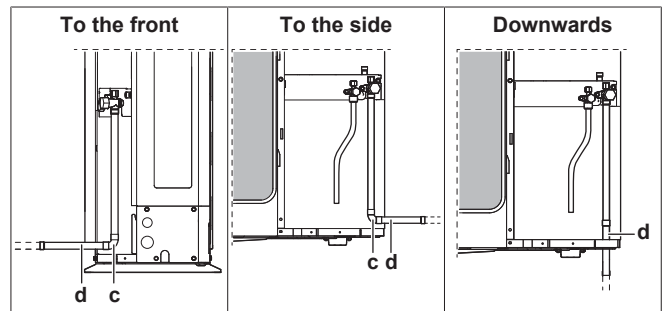
### **!** NOTICE

**When brazing:** First braze the liquid side piping, then the gas side piping. Enter the electrode from the front of the unit and the welding torch from the right side to braze with the flames facing outside and avoid the compressor sound insulation and other piping.



- a Electrode
- b Burning-resistant plate
- c Welding torch
- d Flames
- e Compressor sound insulation
- f Liquid side piping
- g Gas side piping

- Connect the gas piping accessories c and d (d: only for 10 HP). There are three possibilities:



### **!** WARNING

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

### **!** NOTICE

Make sure to open the stop valves after installing the refrigerant piping and performing vacuum drying. Running the system with the stop valves closed may break the compressor.

### **!** 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.

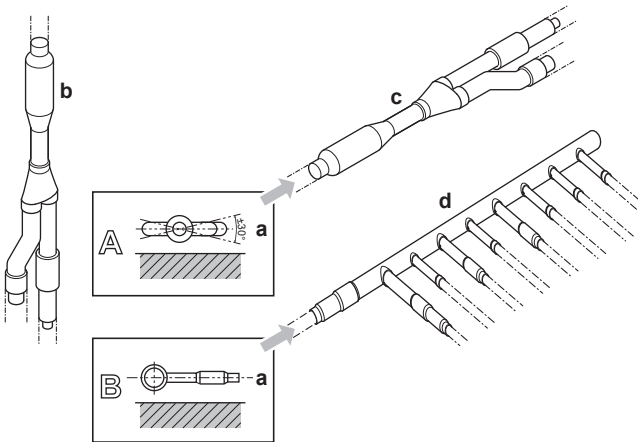
The connections to the branch kits are the responsibility of the installer (field piping).

## 15 Piping installation

### 15.2.5 To connect the refrigerant branching kit

For installation of the refrigerant branching kit, refer to the installation manual delivered with the kit.

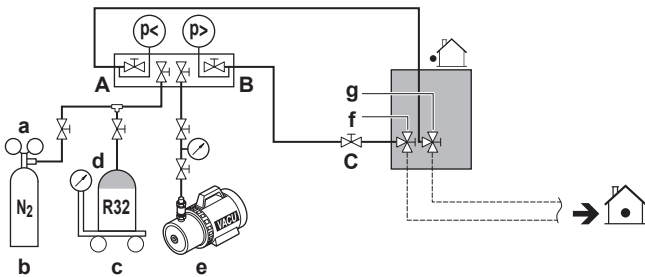
- Mount the refnet joint so that it branches either horizontally or vertically.
- Mount the refnet header so that it branches horizontally.



- a Horizontal surface
- b Refnet joint mounted vertically
- c Refnet joint mounted horizontally
- d Header

## 15.3 Checking the refrigerant piping

### 15.3.1 Checking refrigerant piping: Setup



- a Pressure reducing valve
- b Nitrogen
- c Weighing scales
- d Refrigerant R32 tank (siphon system)
- e Vacuum pump
- f Liquid line stop valve
- g Gas line stop valve
- A Valve A
- B Valve B
- C Valve C

Valve	Status
Valve A	Open
Valve B	Open
Valve C	Open
Liquid line stop valve	Close
Gas line stop valve	Close

#### NOTICE

Indoor units should also be leak and vacuum tested. Keep any possible (field supplied) field piping valves open as well.

### 15.3.2 To perform a leak test

The leak test must satisfy the specifications of EN378-2.

#### Vacuum leak test

- 1 Evacuate the system from the liquid and gas piping to a gauge pressure of  $-100.7 \text{ kPa}$  ( $-1.007 \text{ bar}$ ) for more than 2 hours.
- 2 Once reached, turn off the vacuum pump and check that the pressure does not rise for at least 1 minute.
- 3 Should the pressure rise, the system may either contain moisture (see vacuum drying below) or have leaks.

#### Pressure leak test

- 1 Break the vacuum by pressurising with nitrogen gas to a minimum gauge pressure of  $0.2 \text{ MPa}$  (2 bar). Never set the gauge pressure higher than the maximum operation pressure of the unit, i.e.  $4.0 \text{ MPa}$  (40 bar).
- 2 Test for leaks by applying a bubble test solution to all piping connections.
- 3 Discharge all nitrogen gas.



#### NOTICE

ALWAYS use a recommended bubble test solution from your wholesaler.

NEVER use soap water:

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

### 15.3.3 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 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 bar) and repeat steps 1 to 3 until all moisture has been removed.
- 4 Depending on whether you want to immediately charge refrigerant through the refrigerant charge port or first pre-charge a portion of refrigerant through the liquid line, either open the outdoor unit stop valves, or keep them closed. See "16.3 To charge refrigerant" [p 36] for more information.

### 15.3.4 To insulate the refrigerant piping

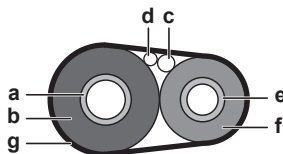
After finishing the leak test and vacuum drying, the piping must be insulated. Take into account the following points:

- Make sure to insulate the connection piping and refrigerant branch kits entirely.
- 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
≤30°C	75% to 80% RH	15 mm
>30°C	≥80% RH	20 mm

### Between outdoor and indoor unit

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



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

- 2 Install the service cover.

### Inside the outdoor unit

To insulate the refrigerant piping, proceed as follows:



- a Insulation material
- b Caulking etc.

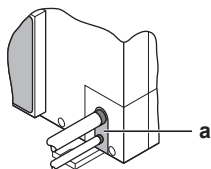
- 1 Insulate the liquid and gas piping.
- 2 Wind heat insulation around the curves, and then cover it with vinyl tape.
- 3 Make sure the field piping does not touch any compressor components.
- 4 Seal the insulation ends (sealant etc.) (b, see above).
- 5 Where necessary, wrap the field piping with vinyl tape to protect the insulation against sharp edges.
- 6 If the outdoor unit is installed above the indoor unit, cover the stop valves with sealing material to prevent condensed water on the stop valves from moving to the indoor unit.



### NOTICE

Any exposed piping can cause condensation.

- 7 Reattach the service cover and the piping intake plate.
- 8 Seal all gaps to prevent snow and small animals from entering the system.



- a Seal



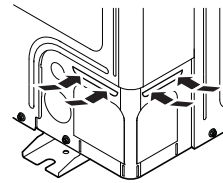
### WARNING

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



### NOTICE

Do not block the air vents. This could affect air circulation inside the unit.



### 15.3.5 To check for leaks after charging refrigerant

After charging refrigerant in the system an additional leak test must be performed. Refer to "16.6 To check refrigerant piping joints for leaks after charging refrigerant" [p 38].

## 16 Charging refrigerant

### 16.1 Precautions when charging refrigerant



### WARNING

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



### NOTICE

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



### NOTICE

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 unit(s) are powered on, the compressor will not operate before the communication is established in a correct way between outdoor unit(s) and indoor unit(s).



### NOTICE

Before starting charging procedures, check if the 7-segment display indication of the outdoor unit A1P PCB is as normal (see "18.1.3 To access mode 1 or 2" [p 42]). If a malfunction code is present, see "22.1 Solving problems based on error codes" [p 48].



### NOTICE

Make sure the connected indoor unit(s) are recognised (see setting [1-10] in "18.1.6 Mode 1: monitoring settings" [p 42]).



### NOTICE

In case of maintenance and the system (outdoor unit+field piping+indoor unit(s)) 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) and the determined additional refrigerant amount.



## 16 Charging refrigerant

### NOTICE

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Charging hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant. See "17.4 To connect the electrical wiring to the outdoor unit" [▶ 39].
- Label the system when charging is complete.
- Extreme care shall be taken not to overfill the refrigerating system.

### NOTICE

Prior to charging the system, it shall be pressure tested with the appropriate purging gas. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

## 16.2 To determine the additional refrigerant amount

### WARNING

The maximum indoor capacity index which can be connected to a SV unit port is determined based on the smallest room served by that port.

In case the system serves the lowest underground floor of a building, there is an extra limit to the maximum allowable total refrigerant amount. This maximum refrigerant amount is determined based on the area of the smallest room on the lowest underground floor.

See "13 Special requirements for R32 units" [▶ 19] to determine the maximum allowable total refrigerant amount.

### INFORMATION

For final charge adjustment in the test laboratory, please contact your local dealer.

### INFORMATION

Note down the amount of additional refrigerant that is calculated here, for later use on the additional refrigerant charge label. See "16.5 To fix the fluorinated greenhouse gases label" [▶ 37].

### NOTICE

The refrigerant charge of the system must be less than 79.8 kg. For factory charge, refer to the unit name plate.

#### Formula:

$$R = [(X_1 \times \varnothing 15.9) \times 0.16 + (X_2 \times \varnothing 12.7) \times 0.10 + (X_3 \times \varnothing 9.5) \times 0.053 + (X_4 \times \varnothing 6.4) \times 0.020] + A$$

R Additional refrigerant to be charged [kg] (rounded off to one decimal place)

X<sub>1...4</sub> Total length [m] of liquid piping size at Øa

A Parameter A (see below)

### INFORMATION

When using more than one SV unit, add the sum of the individual SV unit charge factors.

- Parameter A: Individual SV unit charge factors

Model	Parameter A
SV1A	0.4 kg
SV4A	0.5 kg
SV6A	0.7 kg
SV8A	0.9 kg

**Metric piping.** When using metric piping, replace the weight factors in the formula by the ones from the following table:

Inch piping		Metric piping	
Piping	Weight factor	Piping	Weight factor
Ø6.4 mm	0.020	Ø6 mm	0.016
Ø9.5 mm	0.053	Ø10 mm	0.058
Ø12.7 mm	0.10	Ø12 mm	0.088
Ø15.9 mm	0.16	Ø15 mm	0.14
		Ø16 mm	0.16

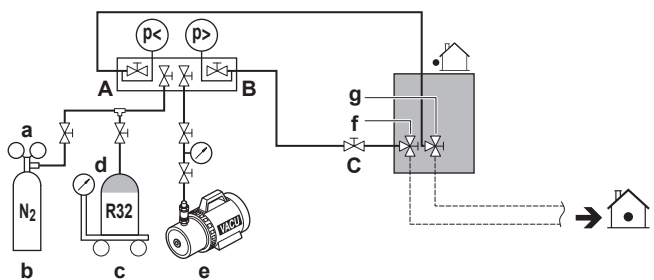
## 16.3 To charge refrigerant

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 manual charging. It can be skipped, but charging will take longer then.

### Pre-charging refrigerant

Pre-charging can be done without compressor operation, by connecting the refrigerant bottle to the service port of the liquid stop valve.

- Connect as shown. Make sure that all outdoor unit stop valves, as well as valve A are closed.



- a Pressure reducing valve
- b Nitrogen
- c Weighing scales
- d Refrigerant R32 tank (siphon system)
- e Vacuum pump
- f Liquid line stop valve
- g Gas line stop valve
- A Valve A
- B Valve B
- C Valve C

- Open valves C and B.
- Pre-charge refrigerant until the determined additional refrigerant amount is reached or pre-charging is not possible anymore, and then close valves C and B.
- Do one of the following:

If	Then
The determined additional refrigerant amount is reached	Disconnect the manifold from the liquid line.  You do not have to perform the "Charging refrigerant (in manual additional refrigerant charge mode)" instructions.

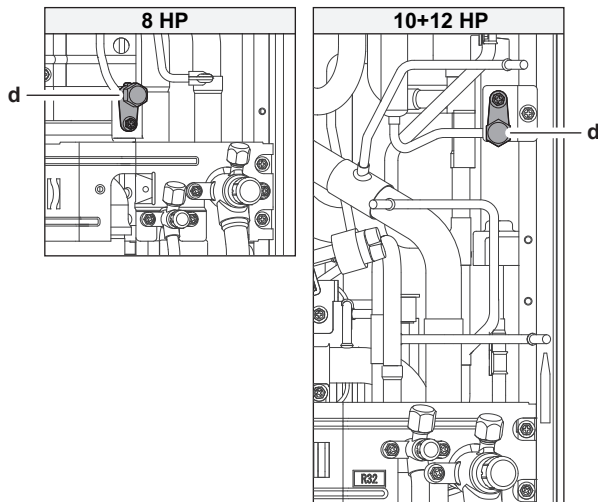
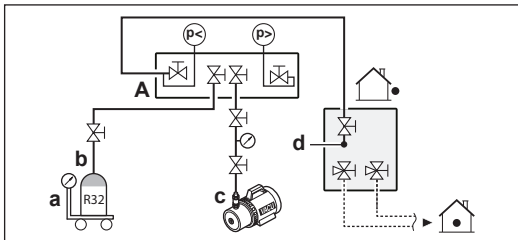


If	Then
Too much refrigerant is charged	Recover refrigerant. Disconnect the manifold from the liquid line. You do not have to perform the "Charging refrigerant (in manual additional refrigerant charge mode)" instructions.
The determined additional refrigerant amount is <b>not reached</b> yet	Disconnect the manifold from the liquid line. Continue with the "Charging refrigerant (in manual additional refrigerant charge mode)" instructions.

## Charging refrigerant (in manual additional refrigerant charge mode)

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

- 5 Connect as shown. Make sure valve A is closed.



### 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.

- 6 Open all outdoor unit stop valves. At this point, valve A must remain closed!
- 7 Take all the precautions mentioned in "18 Configuration" [▶ 41] and "19 Commissioning" [▶ 44] into account.
- 8 Turn on the power of the indoor unit(s) and outdoor unit.
- 9 Activate setting [2-20] to start the manual additional refrigerant charge mode. For details, see "18.1.7 Mode 2: field settings" [▶ 43].

**Result:** The unit will start operation.



### INFORMATION

The manual refrigerant charge operation will automatically stop within 30 minutes. If charging is not completed after 30 minutes, perform the additional refrigerant charging operation again.

- 10 Open valve A.
- 11 Charge refrigerant until the remaining determined additional refrigerant amount is added, and then close valve A.
- 12 Press BS3 to stop the manual additional refrigerant charge mode.



### NOTICE

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

Operating with the stop valves closed will damage the compressor.



### NOTICE

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.

## 16.4 Error codes when charging refrigerant



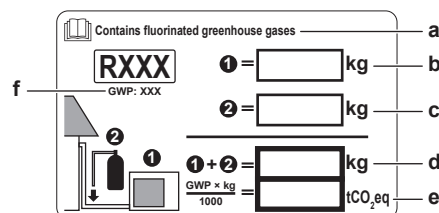
### INFORMATION

If a malfunction occurs, the error code is displayed on the outdoor unit's 7-segments display and on the user interface of the indoor unit.

If a malfunction occurs, close valve A immediately. Confirm the malfunction code and take corresponding action, "22.1 Solving problems based on error codes" [▶ 48].

## 16.5 To fix the fluorinated greenhouse gases label

- 1 Fill in the label as follows:



- 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
- Quantity of fluorinated greenhouse gases** of the total refrigerant charge expressed as tonnes CO<sub>2</sub> equivalent.
- GWP = Global Warming Potential



### NOTICE

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

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

Use the GWP value mentioned on the refrigerant charge label.

- 2 Fix the label on the inside of the outdoor unit. There is a dedicated place for it on the wiring diagram label.

## 17 Electrical installation

### 16.6 To check refrigerant piping joints for leaks after charging refrigerant

#### Tightness test of field-made refrigerant joints indoors

- 1 Use a leakage test method with a minimum sensitivity of 5 g of refrigerant/year. Test leaks using a pressure of at least 0.25 times the maximum working pressure (see "PS High" on the unit nameplate).

#### If a leak is detected

- 1 Recover the refrigerant, repair the joint, and repeat the test.
- 2 Perform the leak tests see "15.3.2 To perform a leak test" [p 34].
- 3 Charge refrigerant.
- 4 Check for refrigerant leaks after charging (see above).

## 17 Electrical installation



#### CAUTION

See "2 Specific installer safety instructions" [p 5] to make sure this installation complies with all safety regulations.

### 17.1 About electrical compliance

#### This equipment complies with:

- EN/IEC 61000-3-12 provided that the short-circuit power  $S_{sc}$  is greater than or equal to the minimum  $S_{sc}$  value at the interface point between the user's supply and the public system.
- EN/IEC 61000-3-12 = European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current  $>16$  A and  $\leq 75$  A per phase.
- It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected ONLY to a supply with a short-circuit power  $S_{sc}$  greater than or equal to the minimum  $S_{sc}$  value.

Model	Minimum $S_{sc}$ value
RXYSA8	2685 kVA
RXYSA10	3137 kVA
RXYSA12	3422 kVA

### 17.2 Specifications of standard wiring components



#### NOTICE

We recommend using solid (single-core) wires. If stranded wires are used, slightly twist the strands to consolidate the end of the conductor for either direct use in the terminal clamp or insertion in a round crimp-style terminal. Details are described in "Guidelines when connecting the electrical wiring" in the installer reference guide.

Component		Outdoor unit		
		RXYSA8	RXYSA10	RXYSA12
Power supply cable	MCA <sup>(a)</sup>	18.5 A	22 A	24 A
	Voltage	380-415 / 400 V		
	Phase	3N~		
	Frequency	50/60 Hz		
	Wire size	5 core cable		
		Must comply with national wiring regulation.		
Wire size based on the current, but not less than:				
	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>		
Interconnection cable	Voltage	220-240 V		
	Wire size	Only use harmonised wire providing double insulation and suitable for applicable voltage. 2-core shielded cable 0.75-1.5 mm <sup>2</sup>		
Recommended field fuse		25 A	32 A	
Earth leakage circuit breaker/ residual current circuit breaker		Must comply with national wiring regulation.		

<sup>(a)</sup> MCA=Minimum circuit ampacity. Stated values are maximum values.

Please use the table above to specify the requirements for the power supply wiring.



#### NOTICE

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

### 17.3 Connecting the electrical wiring

Use the following methods for installing wires:

Wire type	Installation method
Single-core wire Or Stranded conductor wire twisted to "solid-like" connection	<p>a Curled wire (single-core or twisted stranded conductor wire) b Screw c Flat washer</p>

Wire type	Installation method
Stranded conductor wire with round crimp-style terminal	<p>a Terminal b Screw c Flat washer</p> <p>✓ Allowed ✗ NOT allowed</p>

For earth connections, use the following method:

Wire type	Installation method
Single-core wire Or Stranded conductor wire twisted to "solid-like" connection	<p>a Clockwise curled wire (single-core or twisted stranded conductor wire) b Screw c Spring washer d Flat washer e Coupling washer f Sheet metal</p>

**Tightening torques**

Wiring	Screw size	Tightening torque
Transmission wiring	M3.5	0.8~0.97 N•m
Power supply wiring	8 HP: M5	2.2~2.7 N•m
	10+12 HP: M8	5.5~7.3 N•m

**17.4 To connect the electrical wiring to the outdoor unit**



**CAUTION**

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

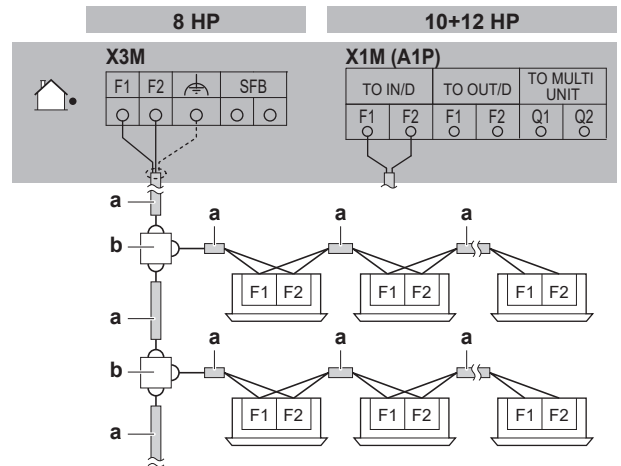


**NOTICE**

- Follow the wiring diagram (delivered with the unit, located at the inside of the service cover).
- Make sure the electrical wiring does NOT obstruct proper reattachment of the service cover.

1 Remove the service cover. See "14.2.1 To open the outdoor unit" [p 28].

2 Connect the transmission wiring as follows:



- a Use the conductor of sheathed wire (2 wire) (no polarity)
- b Terminal board (field supply)

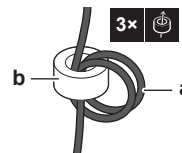
**Note:** The indoor F1/F2 interconnection cable MUST be shielded:

- 8 HP: the shielding is earthed (only at outdoor unit side of the cable) via the middle screw on the terminal X3M.
- 10+12 HP: the shielding is earthed (only at outdoor unit side of the cable) via a metal P-clamp. Strip the insulation up to the shielding mesh, to provide full contact of the earth with the shielding. See illustration below:



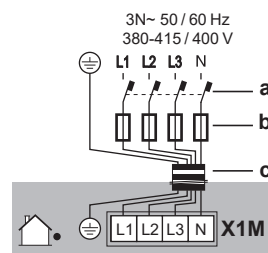
- a P-clamp for cable shield earthing

**Note:** For 10+12 HP, the interconnection cable MUST pass through the ferrite core 3 times (3 passes, 2 turns). See illustration below:



- a Interconnection cable
- b Ferrite core

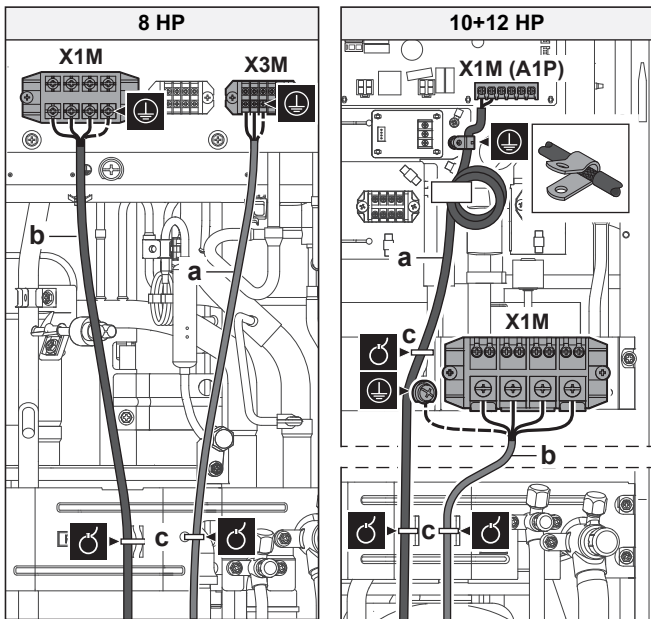
3 Connect the power supply as follows:



- a Earth leakage circuit breaker
- b Fuse
- c Power supply cable

4 Fix the cables (power supply and interconnection cable) with a cable tie to the stop valve attachment plate and route the wiring according to the illustration below.

## 17 Electrical installation

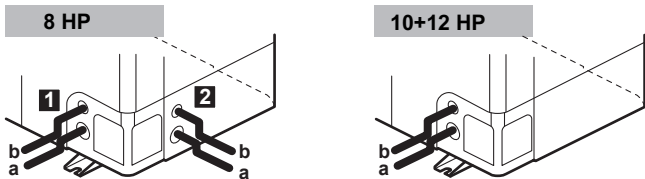


### WARNING

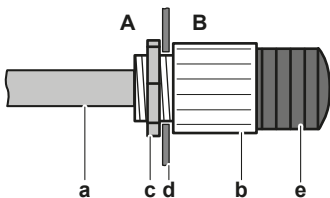
Do NOT strip the outer cable jacket lower than the fixation point on the stop valve attachment plate.

- 5 Route the cables through the frame according to the illustration below.

**Note:** for RXYSA8, choose one of the two possibilities to route the cables through the frame:



- 6 Remove the selected knockout holes by tapping on the attachment points with a flat head screwdriver and a hammer.
- 7 Install a cable protection in the knockout hole:
  - It is recommended to install a PG type cable gland in the knockout hole.
  - When you do not use a cable gland, protect the cables with vinyl tubes to prevent the edge of the knockout hole from cutting the wires:



- A Inside of the outdoor unit
- B Outside of the outdoor unit
- a Cable
- b Bush
- c Nut
- d Frame
- e Tube

- 8 Route the cables out of the unit.
- 9 Reattach the service cover. See "14.2.2 To close the outdoor unit" [p 28].
- 10 Connect an earth leakage circuit breaker and fuse to the power supply line as specified in "17.2 Specifications of standard wiring components" [p 38].

## 17.5 To connect the external outputs

### SVS and SVEO output

The SVS and SVEO outputs are contacts on terminal X2M.

The SVS output is a contact on terminal X2M that closes in case a leak is detected, failure or disconnection of the R32 sensor (located in the SV unit or indoor unit).

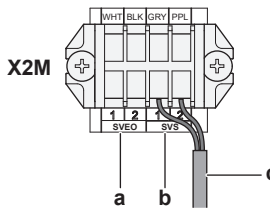
The SVEO output is a contact on terminal X2M that closes in case of occurrence of general errors. See "8.1 Error codes: Overview" [p 15] and "22.1.1 Error codes: Overview" [p 48] for errors that will trigger this output.

Outdoor output connection requirements	
Voltage	220~240 V
Maximum current	0.5 A
Wire size	Only use harmonised wiring providing double insulation and suitable for the applicable voltage. 2-core cable Minimum cable section of 0.75 mm <sup>2</sup>



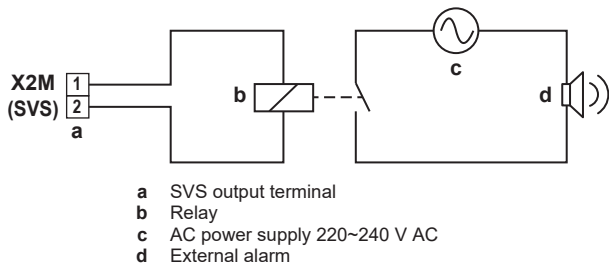
### NOTICE

Do NOT use the outputs as a power source. Instead, use each output to energize a relay that controls the external circuit.



- a SVEO output terminals (1 and 2)
- b SVS output terminals (1 and 2)
- c Cable to SVS output device (example)

### Example:



- a SVS output terminal
- b Relay
- c AC power supply 220~240 V AC
- d External alarm



### INFORMATION

Sound data about the refrigerant leakage alarm are available in the technical data sheet of the user interface. E.g. the BRC1H52\* controller generates an alarm of 65 dB (sound pressure, measured at 1 m distance from the alarm).

### 17.6 To connect the cool/heat selector switch option

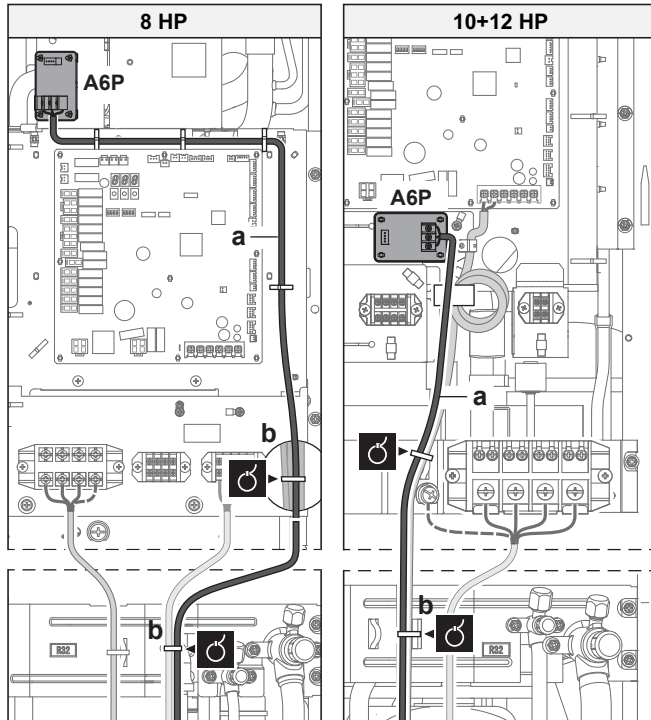
In order to control the cooling or heating operation from a central location, the following optional cool/heat selector switch (KRC19-26A) can be connected:

- 1 Connect the cool/heat selector switch to terminal X1M of the cool/heat selector PCB.

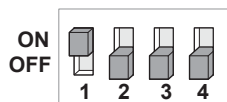


X1M Terminal on the PCB  
KRC19-26A Cool/heat selector switch

- 2 Route the wires in the switchbox as shown:



- 3 Turn ON the DIP switch (DS1-1). See "18.1.2 Field setting components" [p 42] for more information on the DIP switch.



DS1 DIP switch 1

### 17.7 To check the insulation resistance of the compressor



**NOTICE**

If, after installation, refrigerant accumulates in the compressor, the insulation resistance over the poles can drop, but if it is at least 1 MΩ, then the unit will not break down.

- Use a 500 V mega-tester when measuring insulation.
- Do NOT use a mega-tester for low voltage circuits.

- 1 Measure the insulation resistance over the poles.

If	Then
≥1 MΩ	Insulation resistance is OK. This procedure is finished.
<1 MΩ	Insulation resistance is not OK. Go to the next step.

- 2 Turn ON the power and leave it on for 6 hours.

**Result:** The compressor will heat up and evaporate any refrigerant in the compressor.

- 3 Measure the insulation resistance again.

## 18 Configuration



**DANGER: RISK OF ELECTROCUTION**



**INFORMATION**

It is important that all information in this chapter is read sequentially by the installer and that the system is configured as applicable.

### 18.1 Making field settings

#### 18.1.1 About making field settings

To continue the configuration of the VRV 5-S heat pump 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 push buttons on the PCB and reading the feedback from the 7-segment displays.

Next to making field settings it is also possible to confirm the current operation parameters of the unit.

**Push buttons and DIP switches**

Item	Description
Push buttons	By operating the push buttons it is possible to: <ul style="list-style-type: none"> <li>• Perform special actions (refrigerant charge, testrun, etc).</li> <li>• Perform field settings (demand operation, low noise, etc).</li> </ul>
DIP switches	By operating the DIP switches it is possible to: <ul style="list-style-type: none"> <li>• DS1 (1): COOL/HEAT selector (refer to the manual of the cool/heat selector switch). OFF=not installed=factory setting</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> </ul>

See also:

- "18.1.2 Field setting components" [p 42]

**Mode 1 and 2**

Mode	Description
Mode 1 (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 (field settings)	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.  In general, normal operation can be resumed without special intervention after changing field settings.  Some field settings are used for special operation (e.g., one 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.

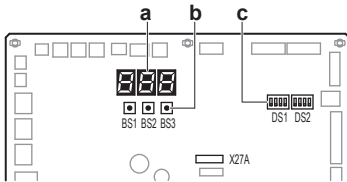
# 18 Configuration

See also:

- "18.1.3 To access mode 1 or 2" ▶ 42]
- "18.1.4 To use mode 1" ▶ 42]
- "18.1.5 To use mode 2" ▶ 42]
- "18.1.6 Mode 1: monitoring settings" ▶ 42]
- "18.1.7 Mode 2: field settings" ▶ 43]

## 18.1.2 Field setting components

Location of the 7-segment displays, buttons and DIP switches:



- BS1** MODE: for changing the set mode
- BS2** SET: for field setting
- BS3** RETURN: for field setting
- DS1, DS2** DIP switches
  - a 7-segment displays
  - b Push buttons
  - c DIP switches

## 18.1.3 To access mode 1 or 2

### Initialisation: default situation



#### NOTICE

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 all indoor units. When the communication between indoor units and outdoor unit(s) is established and normal, the 7-segment display indication state will be as below (default situation when shipped from factory).

Stage	Display
When turning on the power supply: blinking as indicated. First checks on power supply are executed (8~10 min).	
When no trouble occurs: lighted as indicated (1~2 min).	
Ready for operation: blank display indication as indicated.	

- Off
- Blinking
- On

In case of malfunction, the malfunction code is displayed on the indoor unit user interface and the outdoor unit 7-segment display. Solve the malfunction code accordingly. The communication wiring should be checked at first.

#### Access

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

Access	Action
Default situation	
Mode 1	<ul style="list-style-type: none"> <li>▪ Push BS1 one time.</li> </ul> <p>7-segment display indication changes to:</p> <ul style="list-style-type: none"> <li>▪ Push BS1 one more time to return to the default situation.</li> </ul>

Access	Action
Mode 2	<ul style="list-style-type: none"> <li>▪ Push BS1 for at least five seconds.</li> </ul> <p>7-segment display indication changes to:</p> <ul style="list-style-type: none"> <li>▪ Push BS1 one more time (short) to return to the default situation.</li> </ul>



#### INFORMATION

If you get confused in the middle of the process, push BS1 to return to the default situation (no indication on 7-segment displays: blank, see "18.1.3 To access mode 1 or 2" ▶ 42].

## 18.1.4 To use mode 1

Mode 1 is used to set basic settings and to monitor the status of the unit.

What	How
Changing and accessing the setting in mode 1	<ol style="list-style-type: none"> <li>1 Push BS1 one time to select mode 1.</li> <li>2 Push BS2 to select the required setting.</li> <li>3 Push BS3 one time to access the selected setting's value.</li> </ol>
To quit and return to the initial status	Push BS1.

## 18.1.5 To use 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	<ul style="list-style-type: none"> <li>▪ Push BS1 for more than five seconds to select mode 2.</li> <li>▪ Push BS2 to select the required setting.</li> <li>▪ Push BS3 one time to access the selected setting's value.</li> </ul>
To quit and return to the initial status	Push BS1.
Changing the value of the selected setting in mode 2	<ul style="list-style-type: none"> <li>▪ Push BS1 for more than five seconds to select mode 2.</li> <li>▪ Push BS2 to select the required setting.</li> <li>▪ Push BS3 one time to access the selected setting's value.</li> <li>▪ Push BS2 to select the required value of the selected setting.</li> <li>▪ Push BS3 one time to validate the change.</li> <li>▪ Push BS3 again to start operation with the chosen value.</li> </ul>

## 18.1.6 Mode 1: monitoring settings

[1-1]

Shows the status of low noise operation.

[1-1]	Description
0	Unit is currently not operating under low noise restrictions.
1	Unit is currently operating under low noise restrictions.



## [1-2]

Shows the status of power consumption limitation operation.

[1-2]	Description
0	Unit is currently not operating under power consumption limitations.
1	Unit is currently operating under power consumption limitation.

## [1-5] [1-6]

Code	Shows ...
[1-5]	The current $T_e$ target parameter position
[1-6]	The current $T_c$ target parameter position

## [1-10]

Shows the total number of connected indoor units.

## [1-17] [1-18] [1-19]

Code	Shows ...
[1-17]	The latest malfunction code
[1-18]	The 2nd last malfunction code
[1-19]	The 3rd last malfunction code

## [1-40] [1-41]

Code	Shows ...
[1-40]	The current cooling comfort setting
[1-41]	The current heating comfort setting

## 18.1.7 Mode 2: field settings

### [2-8]

$T_e$  target temperature during cooling operation.

[2-8]	$T_e$ target [°C]
0 (default)	Auto
2	6
3	7
4	8
5	9
6	10
7	11

### [2-9]

$T_c$  target temperature during heating operation.

[2-9]	$T_c$ target [°C]
0 (default)	Auto
1	41
2	42
3	43
4	44
5	45
6	46

### [2-20]

Manual additional refrigerant charge/SV/indoor unit connection check

[2-20]	Description
0 (default)	Manual additional refrigerant charge deactivated.

[2-20]	Description
1	Manual additional refrigerant charge activated.  To stop the manual additional refrigerant charge operation (when the required additional refrigerant amount is charged), push BS3. If this function was not aborted by pushing BS3, the unit will stop its operation after 30 minutes. If 30 minutes was not sufficient to add the needed refrigerant amount, the function can be reactivated by changing the field setting again.
2	Perform a SV/indoor unit connection check.  Perform a SV units and indoor units connection check where for each indoor unit is checked if the piping and communication wiring are connected to the same branch pipe port.

### [2-22]

Automatic low noise setting and level during night time.

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. The start and stop moments for this function are defined under setting [2-26] and [2-27]. For more details about settings [2-26] and [2-27], see installer user reference guide

[2-22]	Description	
0 (default)	Deactivated	
1	Level 1	Level 5<Level 4<Level 3<Level 2<Level 1
2	Level 2	
3	Level 3	
4	Level 4	
5	Level 5	

### [2-35]

Height difference setting.

[2-35]	Description
0	In case the outdoor unit is installed in the lowest position (indoor units are installed on a higher position than outdoor units) and the height difference between the highest indoor unit and the outdoor unit exceeds 40 m, the setting [2-35] should be changed to 0.
1 (default)	—

### [2-45]

SV unit shut-off valve setting.

[2-45]	Description
0 (default)	Shut-off valve fully open
1	Shut-off valve fully closed

### [2-54]

Indoor unit connection setting.

[2-54]	Description
0 (default)	Direct connection from outdoor to indoor unit is not possible
1	Direct connection from outdoor to indoor unit is allowed

# 19 Commissioning

## [2-60]

Supervisor remote controller setting. A power reset is required to save this setting.

For details about the supervisor remote controller, see "[13.2 System layout requirements](#)" [▶ 19] or refer to the remote controller installation and user reference guide.

[2-60]	Description
0 (default)	No supervisor remote controller connected to the system
1	Supervisor remote controller connected to system

## 18.1.8 Indoor unit field setting

### 15(25)-13

Safety system deactivation.

When the room where the indoor unit is installed is big enough that no safety measure is required, the R32 leak safety system in that indoor unit can be deactivated by this setting.

Safety system deactivation				
Setting	1 <sup>st</sup> code	Function	2 <sup>nd</sup> code	Description
15/25	13	R32 leak safety system setting	01	Disabled
			02	Enabled

# 19 Commissioning



### CAUTION

See "[2 Specific installer safety instructions](#)" [▶ 5] to make sure commissioning complies with all safety regulations.



### NOTICE

**General commissioning checklist.** Next to the commissioning instructions in this chapter, a general commissioning checklist is also available on the Daikin Business Portal (authentication required).

The general commissioning checklist is complementary to the instructions in this chapter and can be used as a guideline and reporting template during commissioning and hand-over to the user.

## 19.1 Precautions when commissioning



### CAUTION

**Do NOT perform the test operation while working on the indoor unit(s).**

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.



### NOTICE

Turn ON the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.



### NOTICE

Test run is possible for ambient temperatures between -10°C and 50°C.

During test operation, the outdoor unit and the indoor units will start up. Make sure that the preparations of all indoor units are finished (field piping, electrical wiring, air purge, ...). See installation manual of the indoor units for details.

## 19.2 Checklist before commissioning

- 1 After the installation of the unit, check the items listed below.
- 2 Close the unit.
- 3 Power up the unit.

<input type="checkbox"/>	You have read the complete installation and operation instructions described in the <b>installer and user reference guide</b> .
<input type="checkbox"/>	<b>Installation</b> Check that the unit is properly installed, to avoid abnormal noises and vibrations when starting up the unit.
<input type="checkbox"/>	<b>Transportation stay</b> Check that the outdoor unit's transportation stay is removed.
<input type="checkbox"/>	<b>Field wiring</b> Check that the field wiring has been carried out according to the instructions described in the chapter " <a href="#">17 Electrical installation</a> " [▶ 38], according to the wiring diagrams and according to the applicable national wiring regulation.
<input type="checkbox"/>	<b>Power supply voltage</b> Check the power supply voltage on the local supply panel. The voltage MUST correspond to the voltage on the nameplate of the unit.
<input type="checkbox"/>	<b>Earth wiring</b> 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> 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. NEVER use the megatester for the interconnection wiring.
<input type="checkbox"/>	<b>Fuses, circuit breakers, or protection devices</b> Check that the fuses, circuit breakers, or the locally installed protection devices are of the size and type specified in the chapter " <a href="#">17.2 Specifications of standard wiring components</a> " [▶ 38]. Be sure that neither a fuse nor a protection device has been bypassed.
<input type="checkbox"/>	<b>Internal wiring</b> Visually check the switch box and the inside of the unit for loose connections or damaged electrical components.
<input type="checkbox"/>	<b>Pipe size and pipe insulation</b> Be sure that correct pipe sizes are installed and that the insulation work is properly executed.
<input type="checkbox"/>	<b>Stop valves</b> Be sure that the stop valves are open on both liquid and gas side.
<input type="checkbox"/>	<b>Damaged equipment</b> Check the inside of the unit for damaged components or squeezed pipes.
<input type="checkbox"/>	<b>Refrigerant leak</b> Check the inside of the unit on refrigerant leakage. If there is a refrigerant leak, try to repair the leak. If the repair is unsuccessful, call your local dealer. Do not touch any refrigerant which has leaked out from refrigerant piping connections. This may result in frostbite.
<input type="checkbox"/>	<b>Oil leak</b> Check the compressor for oil leakage. If there is an oil leak, try to repair the leak. If the repairing is unsuccessful, call your local dealer.

<input type="checkbox"/>	<b>Air inlet/outlet</b> Check that the air inlet and outlet of the unit is NOT obstructed by paper sheets, cardboard, or any other material.
<input type="checkbox"/>	<b>Additional refrigerant charge</b> 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>Requirements for R32 equipment</b> Make sure the system meets all requirements that are described in the following chapter: <a href="#">"2.1 Instructions for equipment using R32 refrigerant"</a> [▶ 8].
<input type="checkbox"/>	<b>Field settings</b> Make sure all field settings you want are set. See <a href="#">"18.1 Making field settings"</a> [▶ 41].
<input type="checkbox"/>	<b>Field setting [2-54]</b> (direct connection from outdoor to indoor unit) In case of a system with at least one indoor unit that has a direct connection to the outdoor unit, make sure to change field setting [2-54] from 0 to 1. See <a href="#">"[2-54]"</a> [▶ 43].
<input type="checkbox"/>	<b>Installation date and field setting</b> 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).

## 19.3 Checklist during commissioning

<input type="checkbox"/>	To perform a <b>SV unit test run</b> . See the SV unit installation manual for more information.
<input type="checkbox"/>	To perform a <b>test run</b> .
<input type="checkbox"/>	To perform a <b>SV/indoor unit connection check (optional)</b> .

## 19.4 About the SV unit test run

The SV unit test run has to be performed on all SV units in the system, before the test run of the outdoor unit. The SV unit test run has to confirm that the required safety measures are properly installed. Even when no safety measures are required, it is necessary to perform this SV unit test run and confirm the result, because the test run of the outdoor unit checks this confirmation for all SV units in the system. See the SV unit installation and operation manual for more information.



### NOTICE

It is very important that all refrigerant piping work is done before the units (outdoor, SV or indoor) are powered. When the units are powered, the expansion valves initialise. This means that the valves close.

If any part of the system had already been powered before, **FIRST** activate setting [2-21] on the outdoor unit to open the expansion valves again THEN power off the unit to conduct the SV unit test run.

## 19.5 About the system test run



### NOTICE

Make sure to carry out the test run after the first installation. Otherwise, the malfunction code **U3** will be displayed on the user interface and normal operation or individual indoor unit test run cannot be carried out.

The procedure below describes the test operation of the complete system. This operation checks and judges following items:

- Check for incorrect wiring (communication check with indoor unit(s)).
- Check of the stop valves opening.
- Judgement of piping length.
- Abnormalities on indoor units cannot be checked for each unit separately. After the test operation is finished, check the indoor units one by one by performing a normal operation using the user interface. Refer to the indoor unit installation manual for more details concerning the individual test run.



### INFORMATION

- It may take 10 minutes to achieve a uniform refrigerant 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 display indication may change. These are not malfunctions.

### 19.5.1 To perform a test run

- 1 Close all front panels to prevent misjudgement.
- 2 Make sure all field settings you want are set; see ["18.1 Making field settings"](#) [▶ 41].
- 3 Turn ON the power to the outdoor unit and the connected indoor unit(s).



### NOTICE

Turn ON the power 6 hours before operation in order to have power running to the crankcase heater and to protect the compressor.

- 4 Make sure the default (idle) situation is existing; see ["18.1.3 To access mode 1 or 2"](#) [▶ 42]. Push BS2 for 5 seconds or more. The unit will start test operation.

**Result:** The test operation is automatically carried out, the outdoor unit display will indicate "E01" and the indication "Test operation" and "Under centralised control" will display on the user interface of the indoor unit(s).

Steps during the automatic system test run procedure:

Step	Description
E01	Control before start up (pressure equalisation)
E02	Cooling start up control
E03	Cooling stable condition
E04	Communication check and stop valve check
E05	Pipe length check
E09	Pump down operation
E10	Unit stop



### INFORMATION

During the test operation, it is not possible to stop the unit operation from a user interface. To abort the operation, press BS3. The unit will stop after ±30 seconds.

- 5 Check the test operation results on the outdoor unit 7-segment display.

Completion	Description
Normal completion	No indication on the 7-segment display (idle).
Abnormal completion	Indication of malfunction code on the 7-segment display.  Refer to <a href="#">"19.5.2 Correcting after abnormal completion of the test run"</a> [▶ 46] to take actions for correcting the abnormality. When the test operation is fully completed, normal operation will be possible after 5 minutes.

## 20 Hand-over to the user

### 19.5.2 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 outdoor unit 7-segment display. In case of a displayed malfunction code, perform correcting actions as explained in the malfunction code table. Carry out the test operation again and confirm that the abnormality is properly corrected.



#### INFORMATION

Refer to the installation manual of the indoor unit for detailed malfunction codes related to indoor units.

### 19.6 To perform a SV/indoor unit connection check

This test run can be performed to confirm if wiring and piping connections between indoor units and SV units are matching.

For the safe operation of the system, it is mandatory to confirm the wiring and piping connections between the indoor units and SV units. This can be done either via a thorough manual check or via the built-in automatic check.

In case group control is implemented over multiple branch ports of the same SV unit, it is not possible to directly use the built-in automatic check. Consult this chapter in the Installer and User Reference guide for extra information.

Below instruction is only related to the built-in check.

#### SV/indoor automatic connection test run

Operation range for the indoor units is 20~27°C and for the outdoor units this is 0~43°C.

- 1 Close all front panels to prevent misjudgement.
- 2 Make sure the test run is fully completed without malfunction code (see "19.5.1 To perform a test run" [45]).
- 3 To start the SV/indoor unit connection check, make field setting [2-20]=2 (see "18.1.7 Mode 2: field settings" [43]). The unit will start the check operation.

**Result:** The check operation is automatically carried out, the outdoor unit display will indicate "E00" and the indication "Centralised control" and "Test run" will display on the indoor unit user interface(s).

Steps during the automatic connection check procedure:

Step	Description
E00	Check ON
E01	Control before start-up (pressure equalisation)
E02	Four-way valve initial control
E03	Precooling/preheating start-up
E04	Precooling/preheating operations
E05	Misconnection assessment operation
E06	Pumpdown
E07	Restart standby
E08	Stop



#### INFORMATION

During the check operation, it is not possible to stop the unit operation from a user interface. To abort the operation, press BS3. The unit will stop after ±30 seconds.

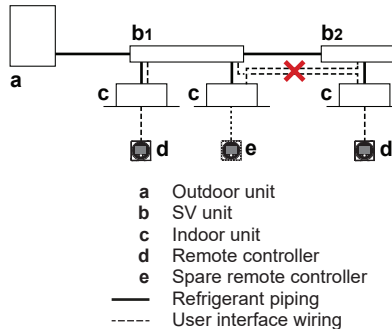
During the check, if the following codes are on 7-segment display, the check will not continue, take actions for correcting.

Code	Description
E-2	Indoor unit is out of temperature range 20~27°C for SV connection check.
E-3	Outdoor unit is out of temperature range 0~43°C for SV connection check.
E-4	Too low pressure was noticed during SV connection check. Restart SV/indoor unit connection check.
E-5	Indicates an indoor unit is not compatible with this function.
E-6	1 Only a single port SV unit (SV1A) is used in the setup. 2 Only a single port or a combined single port in the multi SV unit (SV4~8A) is used in the setup

- 4 Check the results on the outdoor unit 7-segment display.

Completion	Description
Normal completion	"OH" on the 7-segment display.
Abnormal completion	Indication of malfunction code on the 7-segment display.  Refer to "19.5.2 Correcting after abnormal completion of the test run" [46] to take actions for correcting the abnormality. When the check is fully completed, normal operation will be possible after 5 minutes.

In case of miswiring between two different SV units, it is not possible to detect a misconnection during the check.



**Note:** Connection check is not possible in the following cases:

- connection with only air handling units (pair or multi-application).
- connection of air curtain (Biddle).
- connection of air handling unit in heating dedication mode (mix application).

## 20 Hand-over to the user

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

- Make sure that the user has the printed documentation and ask him/her to keep it for future reference. Inform the user that he/she can find the complete documentation at the URL mentioned earlier in this manual.
- Explain to the user how to properly operate the system and what to do in case of problems.
- Show the user what to do for the maintenance of the unit.

## 21 Maintenance and service



### NOTICE

Maintenance **MUST** be done by an authorised installer or service agent.

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



### NOTICE

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

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

### 21.1 Maintenance safety precautions



**DANGER: RISK OF ELECTROCUTION**



**DANGER: RISK OF BURNING/SCALDING**



### WARNING

Prior to start working on systems containing flammable refrigerant, safety checks are necessary to ensure that the risk of ignition is minimised. Therefore, some instructions should be followed.

Please refer to the service manual for more information.



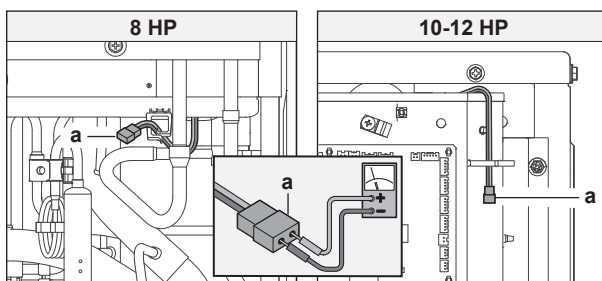
### NOTICE: Risk of electrostatic discharge

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

#### 21.1.1 To prevent electrical hazards

When performing service to inverter equipment:

- 1 Do NOT perform electrical work for 10 minutes after turning off the power supply.
- 2 Measure the voltage between terminals on the terminal block for power supply with a tester and confirm that the power supply is shut off. In addition, measure points as shown in the figure, with a tester and confirm that the voltage of the capacitor in the main circuit is less than 50 V DC. If the voltage measured is still higher than 50 V DC, discharge the capacitors in a safe manner by using a dedicated capacitor discharge pen to avoid possibility of sparking.



a Connector for capacitor voltage check

- 3 Pull out junction connectors X1A, X2A for the fan motors in the outdoor unit before starting service operation on the inverter equipment. Be careful NOT to touch the live parts. (If a fan rotates due to strong wind, it may store electricity in the capacitor or in the main circuit and cause electrical shock.)

- 4 After the service is finished, plug the junction connector back in. Otherwise the malfunction code E7 will be displayed on the user interface or on the outdoor unit 7-segment display and normal operation will NOT be performed.

For details refer to the wiring diagram labelled on the back of the switch box/service cover.

Pay attention to the fan. It is dangerous to inspect the unit while the fan is running. Make sure to turn off the main switch and to remove the fuses from the control circuit located in the outdoor unit.

### 21.2 Checklist for yearly maintenance of the outdoor unit

Check the following at least once a year:

- Heat exchanger

The heat exchanger of the outdoor unit can get blocked up due to dust, dirt, leaves, etc. It is recommended to clean the heat exchanger yearly. A blocked heat exchanger can lead to too low pressure or too high pressure leading to worse performance.

### 21.3 About service mode operation

Refrigerant recovery operation/vacuuming operation is possible by applying setting [2-21]. Refer to "18.1 Making field settings" [p 41] for details how to set mode 2.

When vacuuming/recovery mode is used, check very carefully what should be vacuumed/recovered before starting. See installation manual of the indoor unit for more information about vacuuming and recovery.

#### 21.3.1 To use vacuum mode

- 1 When the unit is at standstill, set the unit in [2-21]=1.

**Result:** When confirmed, the indoor and outdoor unit expansion valves will fully open. At that moment the 7-segment display indication=E7 and the user interface of all indoor units indicate TEST (test operation) and (external control) and the operation will be prohibited.

- 2 Evacuate the system with a vacuum pump.
- 3 Press BS3 to stop vacuuming mode.

#### 21.3.2 To recover refrigerant

This should be done with a refrigerant recovery unit. Follow the same procedure as for vacuuming method.



**DANGER: RISK OF EXPLOSION**

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

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



### NOTICE

Make sure to NOT recover any oil while recovering refrigerant. **Example:** By using an oil separator.

#### 21.3.3 Before the maintenance and service of a system with SV unit

Before starting the maintenance and service, field setting "[2-45]" [p 43] must be applied on the outdoor unit. For more information, see "18.1.7 Mode 2: field settings" [p 43].



## 22 Troubleshooting

If field setting "[2-45]" [▶ 43] is applied, the shut-off valves of the SV unit will close. The compressor, outdoor fan and indoor unit will stop operating and the 7-segment display will show code "E3".

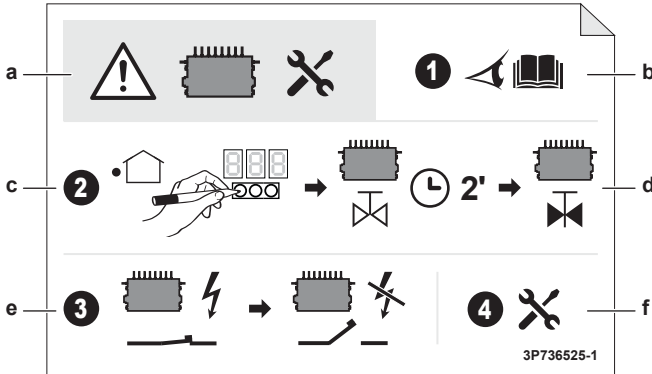
To confirm the full closure of the shut-off valves, "oH" will be shown on the 7-segment display of the outdoor unit.

The system power supply must be turned off for maintenance.

### 21.4 SV unit maintenance and service label

#### WARNING

Never power off the unit for maintenance and service before the shut-off valves are closed.



- a Caution for maintenance and servicing of SV unit
- b Consult the installation manual or service manual
- c Apply the field setting on the outdoor unit
- d Wait for two minutes to allow the system to close the valves
- e Turn off the system power
- f Perform maintenance and servicing on the SV unit

## 22 Troubleshooting



#### CAUTION

See "2 Specific installer safety instructions" [▶ 5] to make sure troubleshooting complies with all safety regulations.

### 22.1 Solving problems based on error codes

In case of a displayed malfunction code, perform correcting actions as explained in the malfunction code table.

After correcting the abnormality, press BS3 to reset the malfunction code and retry operation.

The malfunction code which is displayed on the outdoor unit will indicate a main malfunction code and a sub code. The sub code indicates more detailed information about the malfunction code. The malfunction code will be displayed intermittent.

#### Example:

Code	Example
Main code	E3
Sub code	-01

With an interval of 1 second, the display will switch between main code and sub code.



#### INFORMATION

See the service manual for:

- The complete list of error codes
- A more detailed troubleshooting guideline for each error

#### 22.1.1 Error codes: Overview

Main code	Sub code	Cause	Solution	SVEO <sup>(a)</sup>	SVS <sup>(b)</sup>
R0	-11	The R32 sensor in one of the indoor units has detected a refrigerant leak <sup>(c)</sup>	Possible R32 leak. The SV unit will close the shut-off valves of the branch pipe port to which the corresponding indoor unit is connected. Indoor units on this branch pipe port will be out of operation until the leak is repaired. In case the indoor unit is directly connected to the outdoor unit, the compressor will shut down and the unit will stop operating. Also all shut-off valves for all ports in all SV units in the system will be closed. Refer to service manual for more information.		✓
	-20	The R32 sensor in one of the SV unit has detected a refrigerant leak	Possible R32 leak. The SV unit will close all of its shut-off valves and triggers the ventilation system of the SV unit. The system goes in locked status. Service is needed to repair the leak and activate the system. Refer to the service manual for more information.		✓
	IC	Safety system error (leak detection) <sup>(c)</sup>	An error related to the safety system occurred. Refer to the service manual for more information.		



Main code	Sub code	Cause	Solution	SVEO <sup>(a)</sup>	SVS <sup>(b)</sup>
CH	-01	R32 sensor malfunction in one of the indoor units <sup>(c)</sup>	Check connection on PCB or actuator. The system will continue operating, but the indoor unit in scope will stop operating. Refer to the service manual for more information.		✓
	-02	R32 sensor end of lifetime in one of the indoor units <sup>(c)</sup>	One of the sensors is at the end of lifetime and must be replaced. Refer to the service manual for more information.		
	-05	R32 sensor end of lifetime<6 months in one of the indoor units <sup>(c)</sup>	One of the sensors is almost at the end of lifetime and must be replaced. Refer to the service manual for more information.		
	-10	Waiting for indoor unit R32 sensor replacement input <sup>(c)</sup>	Refer to the service manual for more information.		
	-20	Waiting for SV unit replacement input	Refer to the service manual for more information.		
	-21	R32 sensor malfunction in one of the SV units	Check connection on PCB or actuator. The system will continue operation, but SV unit in scope will stop operating. Refer to the service manual for more information.		✓
	-22	R32 sensor end of lifetime less than 6 months in one of the SV units	One of the sensors is at the end of lifetime (for CH-22: almost) and must be replaced.		
	-23	R32 sensor end of lifetime in one of the SV units	Refer to the service manual for more information.		
EA	-27	SV unit damper malfunction	Check damper motor of the SV unit(s). Possibly the damper cannot rotate or rotation is not detected. Refer to the service manual for more information.		✓
E2	-01	Earth leakage detector activated	Restart the unit. If the problem reoccurs, contact your dealer.		
	-05	Earth leakage detector malfunction (open circuit) - A1P (X101A)	Check connection on PCB or actuator.		
E3	-01	High pressure switch was activated (S1PH) – main PCB (X2A)	Check stop valve situation or abnormalities in (field) piping or airflow over air cooled coil.		
	-02	<ul style="list-style-type: none"> <li>▪ Refrigerant overcharge</li> <li>▪ Stop valve closed</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check refrigerant amount+recharge unit.</li> <li>▪ Open stop valves</li> </ul>		
	-13	Stop valve closed (liquid)	Open liquid stop valve.		
	-18	<ul style="list-style-type: none"> <li>▪ Refrigerant overcharge</li> <li>▪ Stop valve closed</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check refrigerant amount+recharge unit.</li> <li>▪ Open stop valves.</li> </ul>		
E4	-01	Low pressure malfunction: <ul style="list-style-type: none"> <li>▪ Stop valve closed</li> <li>▪ Refrigerant shortage</li> <li>▪ Indoor unit malfunction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Open stop valves.</li> <li>▪ Check refrigerant amount+recharge unit.</li> <li>▪ Check the user interface's display or interconnection wiring between the outdoor unit and the indoor unit.</li> </ul>		
E9	-01	Electronic expansion valve malfunction (heat exchanger) (Y1E) – main PCB (X21A)	Check connection on PCB or actuator.		
	-04	Electronic expansion valve malfunction (inverter cooling) (Y3E) – main PCB (X23A)	Check connection on PCB or actuator.		
	-25	Electronic expansion valve malfunction (liquid injection) (Y4E) – main PCB (X25A)	Check connection on PCB or actuator.		
	-29	Electronic expansion valve malfunction (subcool heat exchanger) (Y2E) – main PCB (X26A)	Check connection on PCB or actuator.		
F3	-01	Discharge temperature too high (R21T) – main PCB (X33A): <ul style="list-style-type: none"> <li>▪ Stop valve closed</li> <li>▪ Refrigerant shortage</li> </ul>	<ul style="list-style-type: none"> <li>▪ Open stop valves.</li> <li>▪ Check refrigerant amount+recharge unit.</li> </ul>		
	-20	Compressor casing temperature too high (R8T) – main PCB (X33A): <ul style="list-style-type: none"> <li>▪ Stop valve closed</li> <li>▪ Refrigerant shortage</li> </ul>	<ul style="list-style-type: none"> <li>▪ Open stop valves.</li> <li>▪ Check refrigerant amount+recharge unit.</li> </ul>		
H9	-01	Ambient temperature sensor malfunction (R1T) – main PCB (X18A)	Check connection on PCB or actuator.		

## 22 Troubleshooting

Main code	Sub code	Cause	Solution	SVEO <sup>(a)</sup>	SVS <sup>(b)</sup>
J3	-16	Discharge temperature sensor malfunction (R21T): open circuit – main PCB (X33A)	Check connection on PCB or actuator.		
	-17	Discharge temperature sensor malfunction (R21T): short circuit - main PCB (X33A)	Check connection on PCB or actuator.		
	-47	Compressor casing temperature sensor malfunction (R8T): open circuit - main PCB (X33A)	Check connection on PCB or actuator.		
	-48	Compressor casing temperature sensor malfunction (R8T): short circuit - main PCB (X33A)	Check connection on PCB or actuator.		
J5	-18	Suction temperature sensor (R3T) – main PCB (X30A)	Check connections on PCB or actuator.		
J6	-01	Heat exchanger deicer temperature sensor (R7T) – main PCB (X30A)	Check connection on PCB or actuator		
J7	-06	Subcool heat exchanger – liquid - temperature sensor (R5T) - main PCB (X30A)	Check connection on PCB or actuator.		
J8	-01	Heat exchanger – liquid -temperature sensor (R4T ) - main PCB (X30A)	Check connection on PCB or actuator.		
J9	-01	Subcool heat exchanger – gas - temperature sensor (R6T) – main PCB (X30A)	Check connection on PCB or actuator.		
J8	-06	High pressure sensor malfunction (S1NPH): open circuit - main PCB (X32A)	Check connection on PCB or actuator.		
	-07	High pressure sensor malfunction (S1NPH): short circuit - main PCB (X32A)	Check connection on PCB or actuator.		
J9	-06	Low pressure sensor malfunction (S1NPL): open circuit - main PCB (X31A)	Check connection on PCB or actuator.		
	-07	Low pressure sensor malfunction (S1NPL): short circuit - main PCB (X31A)	Check connection on PCB or actuator.		
L9	-14	Transmission outdoor unit - inverter: INV1 transmission trouble - main PCB (X20A, X28A, X40A)	Check connection.		
	-19	Transmission outdoor unit - inverter: FAN1 transmission trouble - main PCB (X20A, X28A, X40A)	Check connection.		
	-24	Transmission outdoor unit - inverter: FAN2 transmission trouble - main PCB (X20A, X28A, X40A)	Check connection.		
P1	-01	INV1 unbalanced power supply voltage	Check if power supply is within range.		
U1	-01	Reversed power supply phase malfunction	Correct phase order.		
	-04	Reversed power supply phase malfunction	Correct phase order.		
U2	-01	INV1 voltage power shortage	Check if power supply is within range.		
	-02	INV1 power phase loss	Check if power supply is within range.		
U3	-03	Malfunction code: system test run not yet executed (system operation not possible)	Execute system test run.		
	-04	An error occurred during the test run	Re-execute the test run.		
	-05, -06	Test run aborted	Re-execute the test run.		
	-07, -08	Test run aborted due to communication issues	Check the communication wires and re-execute the test run.		
	-12	Commissioning of SV unit safety system is not completed	Complete commissioning of SV unit safety system. Refer to SV unit manual for more information.	✓	
U4	-03	Indoor unit communication error	Check user interface connection.		
U7	-03, -04	Malfunction code: faulty wiring to Q1/Q2	Check Q1/Q2wiring.		
	-11	Too many indoor units are connected to F1/F2 line	Check indoor unit amount and total capacity connected.		
U9	-01	Warning because there is an error on another unit (indoor/SV unit)	Check if other indoor units/SV units have a malfunction and confirm if indoor unit mix is allowed.		

Main code	Sub code	Cause	Solution	SVEO <sup>(a)</sup>	SVS <sup>(b)</sup>
UR	-03	Connection malfunction over indoor units or type mismatch	Check if other indoor units have a malfunction and confirm if indoor unit mix is allowed.		
	-18	Connection malfunction over indoor units or type mismatch	Check if other indoor units have a malfunction and confirm if indoor unit mix is allowed.		
	-20	Wrong outdoor unit connected	Disconnect the outdoor unit.		
	-29	There is a direct indoor unit connection, but the field setting [2-54] is not set to '1'.	Set field setting [2-54]=1		
	-52	SV unit refrigerant type abnormality	Check SV unit refrigerant type		
	-53	SV unit DIP switch abnormality	Check the DIP switches of the SV unit.	✓	
UF	-01	Mismatch between wiring path and piping path during test run	Mistake detected during SV unit and indoor unit connection check (see "19.6 To perform a SV/indoor unit connection check" [▶46]). Confirm wiring between indoors and SV units.  Refer to SV unit manual for correct way of wiring.	✓	
	-18				
UH	-01	Auto address malfunction (inconsistency)	Check if interconnected unit amount matches with powered unit amount (by monitor mode) or wait until initialisation is finished.		
UJ	-40	Maintenance warning (ventilation fan)	SV unit ventilation needs maintenance check. Refer to the SV unit manual for more information.		

In case other error codes appear, contact your dealer.


<sup>(a)</sup> The SVEO terminal provides an electrical contact that closes in case the indicated error occurs.

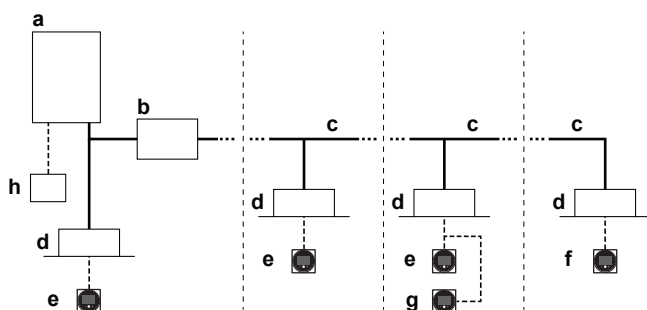
<sup>(b)</sup> The SVS terminal provides an electrical contact that closes in case the indicated error occurs.

<sup>(c)</sup> The error code is only shown on the user interface of the indoor unit where the error occurs.

## 22.2 Refrigerant leak detection system

### Normal operation

During normal operation, the alarm only and supervisor remote controller have no functionality. The screen of the remote controller in alarm only and supervisor mode will be off. Operation of the remote controller can be checked by pushing the  button to open the installer menu.



- a Heat pump outdoor unit
- b SV unit
- c Refrigerant piping
- d VRV direct expansion (DX) indoor unit
- e Remote controller in normal mode
- f Remote controller in alarm only mode
- g Remote controller in supervisor mode (mandatory in some situations)
- h Centralised controller (optional)

**Note:** During start-up of the system, the mode of the remote control can be verified from the screen.

### Leak detection operation

- 1 If the R32 sensor in the indoor unit detects a refrigerant leak:
  - The user will be warned by both audible and visible signals of the remote controller of the leaking indoor unit (and the supervisor remote controller, if applicable).
  - At the same time the SV unit will close the shut-off valves of the corresponding branch pipe in order to reduce the amount of refrigerant in the indoor system.
  - After the operation, the indoor units of the port where the leak was detected will be out of operation and display an error. The rest of the system will continue operation.
- 2 If the R32 sensor in the indoor unit without a SV unit (directly connected to the outdoor unit) detects a refrigerant leak:
  - All shut off valves in SV units connected to other indoor units will be closed, the compressor will be shut down and the system cannot operate anymore.
- 3 If the R32 sensor in the SV unit detects a refrigerant leak:
  - The SV unit will close all of its shut-off valves and triggers the ventilation system (if equipped) of the SV unit to evacuate the leaking refrigerant.
  - After the operation, the system will go in locked state and the remote controllers will display an error. Service is needed to repair the leak and activate the system. Refer to the service manual for more information.

Feedback of the remote controller after leak detection operation will depend on its mode.

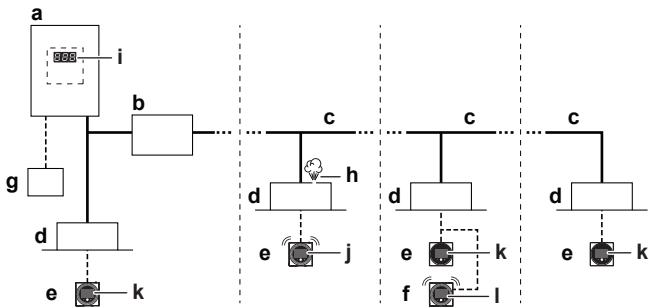


#### WARNING

The unit is equipped with a refrigerant leak detection system for safety.

To be effective, the unit **MUST** be electrically powered at all times after installation, except for maintenance.

## 23 Disposal



- a Heat pump outdoor unit
- b SV unit
- c Refrigerant piping
- d VRV direct expansion (DX) indoor unit
- e Remote controller in normal mode and alarm only mode
- f Remote controller in supervisor mode (mandatory in some situations)
- g Centralised controller (optional)
- h Refrigerant leak
- i Outdoor unit error code on 7-segment display
- j Error code 'A0-11' and audible alarm and red warning signal is generated from this remote controller.
- k Error code 'U9-01' is displayed on this remote controller. No alarm or warning lights.
- l Error code 'A0-11' and audible alarm and red warning signal is generated from this **supervisor** remote controller. The unit **address** is displayed on this remote controller.

**Note:** It is possible to stop the leak detection alarm from the remote controller and from the app. To stop the alarm from the remote controller, press for 3 seconds.

**Note:** Leak detection will trigger SVS output. For more information, see "17.5 To connect the external outputs" [p 40].

**Note:** An optional output PCB for the indoor unit can be added to provide output for external device. The output PCB will trigger in case a leak is detected. For exact model name see option list of the indoor unit. For more information about this option, refer to the installation manual of the optional output PCB

**Note:** Some centralised controllers can also be used as supervisor remote controller. For further details on installation, please refer to the installation manual of the centralised controllers.



### NOTICE

The R32 refrigerant leakage sensor is a semiconductor detector which may incorrectly detect substances other than R32 refrigerant. Avoid using chemical substances (e.g. organic solvents, hair spray, paint) in high concentrations, in the close proximity of the indoor unit because this may cause misdetection by the R32 refrigerant leakage sensor.

## 23 Disposal



### NOTICE

Do NOT try to dismantle the system yourself: dismantling of the system, treatment of the refrigerant, oil and other parts MUST comply with applicable legislation. Units MUST be treated at a specialised treatment facility for reuse, recycling and recovery.

## 24 Technical data

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

### 24.1 Service space: Outdoor unit

When mounting units side by side, the piping route must be to the front or downwards. In this case the piping route to the side is not possible.

#### Single unit | Single row of units

→ See "figure 1" [p 2] on the inside of the front cover of this manual.

- A, B, C, D Obstacles (walls/baffle plates)
- E Obstacle (roof)
- a, b, c, d, e Minimum service space between the unit and obstacles A, B, C, D and E
- e<sub>a</sub> Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle B
- e<sub>b</sub> Maximum distance between the unit and the edge of obstacle E, in the direction of obstacle D
- H<sub>u</sub> Height of the unit
- H<sub>B</sub>, H<sub>D</sub> Height of obstacles B and D
- 1 Seal the bottom of the installation frame to prevent discharged air from flowing back to the suction side through the bottom of the unit.
- 2 Maximum two units can be installed.
- Not allowed

**Note:** For better serviceability, use a distance  $\geq 250$  mm for all dimensions marked with 'a'.

#### Multiple rows of units

→ See "figure 2" [p 2] on the inside of the front cover of this manual.

**Note:** For better serviceability, use a side by side distance  $\geq 250$  mm (instead of  $\geq 100$  mm as shown on the figures above).

#### Stacked units (max. 2 levels)

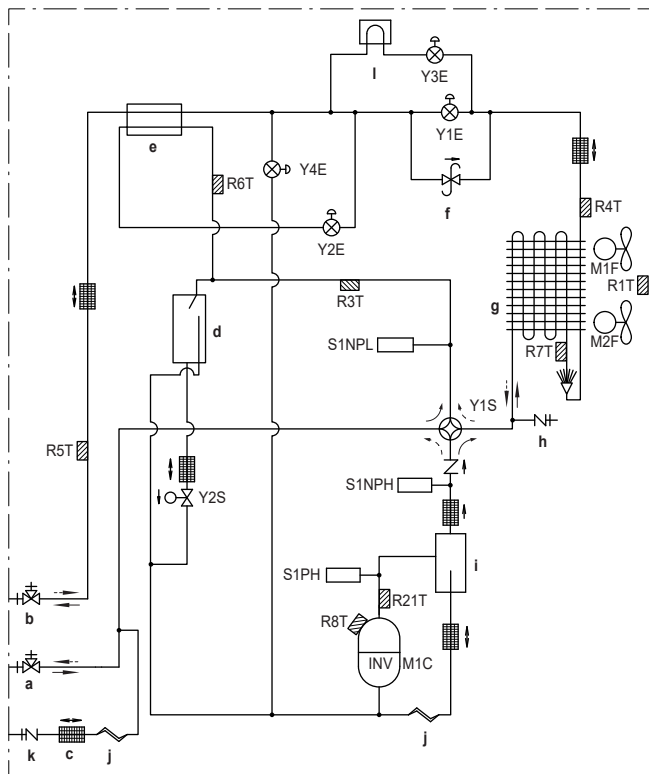
→ See "figure 3" [p 2] on the inside of the front cover of this manual.

- A1=>A2 (A1) If there is danger of drainage dripping and freezing between the upper and lower units...
- (A2) Then install a **roof** between the upper and lower units. Install the upper unit high enough above the lower unit to prevent ice buildup at the upper unit's bottom plate.
- B1=>B2 (B1) If there is no danger of drainage dripping and freezing between the upper and lower units...
- (B2) Then it is not required to install a roof, but **seal the gap** between the upper and lower units to prevent discharged air from flowing back to the suction side through the bottom of the unit.

**Note:** For better serviceability, use a side by side distance  $\geq 250$  mm (instead of  $\geq 100$  mm as shown on the figures above).

## 24.2 Piping diagram: Outdoor unit

Piping diagram: 8 HP



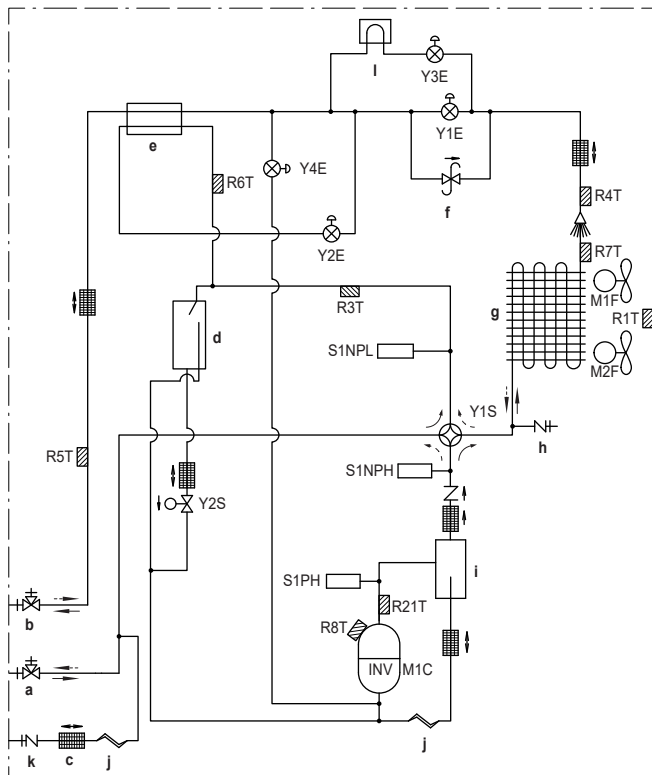
**Legend:**

- a Stop valve (gas)
- b Stop valve (liquid)
- c Filter (6×)
- d Accumulator
- e Subcool tube heat exchanger
- f Pressure regulating valve
- g Heat exchanger
- h Service port
- i Oil separator
- j Capillary tube (2×)
- k Charge port
- l Heat sink
- M1C Compressor
- M1F-M2F Fan motor
- R1T Thermistor (air)
- R3T Thermistor (suction accumulator)
- R4T Thermistor (heat exchanger, liquid)
- R5T Thermistor (liquid)
- R6T Thermistor (subcool heat exchanger, gas)
- R7T Thermistor (de-icer)
- R8T Thermistor (M1C body)
- R21T Thermistor (M1C discharge pipe)
- S1NPH High pressure sensor
- S1NPL Low pressure sensor
- S1PH High pressure switch
- Y1E Electronic expansion valve (main)
- Y2E Electronic expansion valve (subcool heat exchanger)
- Y3E Electronic expansion valve (inverter cooling)
- Y4E Electronic expansion valve (liquid injection)
- Y1S Solenoid valve (4-way valve)
- Y2S Solenoid valve (accumulator oil return)
- Cooling
- ↔ Heating

## 24.3 Wiring diagram: Outdoor unit

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

Piping diagram: 10+12 HP



**Notes:**

- 1 Symbols (see below).
- 2 Refer to the installation or service manual on how to use the BS1~BS3 push buttons and DS1~DS2 switches.
- 3 Do not operate the unit by short-circuiting protection device S1PH.
- 4 Refer to the installation manual for indoor-outdoor transmission F1-F2 wiring.
- 5 When using the central control system, connect outdoor-outdoor transmission F1-F2.
- 6 The capacity of the contact is 220~240 VAC – 0.5 A. (Rush current needs 3 A or less)
- 7 Use dry contact for micro-current (1 mA or less 12VDC).

**Symbols:**

- X1M Main terminal
- Earth wiring
- 15 Wire number 15
- Field wire
- ▬▬▬ Field cable
- \*\*/12.2 Connection \*\* continues on page 12 column 2
- ① Several wiring possibilities
- ▭ Option
- ▭ Not mounted in switch box
- ▭ Wiring depending on model
- ▭ PCB

**Colours:**

- BLK Black
- BLU Blue
- BRN Brown

## 24 Technical data

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GRN	Green
ORG	Orange
RED	Red
WHT	White
YLW	Yellow

### Legend for wiring diagram:

A1P	Printed circuit board (main)
A2P	Printed circuit board (noise filter)
A3P	Printed circuit board (inverter)
A4P	Printed circuit board (fan 1)
A5P	Printed circuit board (fan 2)
A6P	Printed circuit board (cool/heat selector)
BS* (A1P)	Push button switch
DS* (A1P)	DIP switch
E1HC	Crankcase heater
F1U (A1P)	Fuse (T 10 A / 250 V)
F1U, F2U	Fuse (T 1 A / 250 V)
F3U	Field fuse (field supply)
HAP (A1P)	Light-emitting diode (service monitor is green)
K*R (A*P)	Relay on PCB
L1R	Reactor
M1C	Motor (compressor)
M1F, M2F	Motor (upper and lower fan)
Q1DI	Earth leakage circuit breaker (field supply)
R1T	Thermistor (air)
R3T	Thermistor (suction accumulator)
R4T	Thermistor (heat exchanger liquid)
R5T	Thermistor (liquid)
R6T	Thermistor (subcool heat exchanger gas)
R7T	Thermistor (de-icer)
R8T	Thermistor (M1C body)
R21T	Thermistor (M1C discharge pipe)
S1NPH	High pressure sensor
S1NPL	Low pressure sensor
S1PH	High pressure switch
S1S	Air control switch (optional)
S2S	Cool/heat switch (optional)
SEG* (A1P)	7-segment display
SFB	Mechanical ventilation error input (field supply)
T1A	Current sensor
X*A	Connector
X*M	Terminal strip
Y1E	Electronic expansion valve (heat exchanger)
Y2E	Electronic expansion valve (subcool heat exchanger)
Y3E	Electronic expansion valve (inverter cooling)
Y4E	Electronic expansion valve (liquid injection)
Y1S	Solenoid valve (4-way valve)
Y2S	Solenoid valve (accumulator oil return)
Y3S	Error operation output (SVEO)(field supply)
Y4S	Leak sensor output (SVS)(field supply)
Z*C	Noise filter (ferrite core)





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