



FULL DC INVERTER SYSTEMS

USER MANUAL

OUTDOOR UNITS SDV5-XXXEA3P

COMMERCIAL AIR CONDITIONERS SDV5

Original instructions

IMPORTANT NOTE:

Read this manual carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

CONTENTS

1 OVERVIEW	
• 1.1 Meaning of Various Labels	01
2 SYSTEM INFORMATION	01
3 USER INTERFACE	01
4 BEFORE OPERATING	01
5 OPERATIONS	
• 5.1 Operating Range	02
• 5.2 Operating System	02
• 5.3 Using the Dry Program	03
6 MAINTENANCE AND REPAIR	
• 6.1 Maintenance after Unit has been Shut Down for a Long Period	03
• 6.2 Maintenance Before Unit is Shut Down for a Long Period	03
• 6.3 About the Refrigerant	04
• 6.4 After-sales Service and Warranty	04
7 TROUBLESHOOTING	
• 7.1 Error Code: Overview	05
• 7.2 Fault Symptom: Non Air Conditioning Issues	07
8 CHANGE INSTALLATION SITE	08
9 DISPOSAL	08

1 OVERVIEW

1.1 Meaning of Various Labels

The precautions and things to note in this document involve very important information. Please read them carefully.

WARNING

A situation that may lead to severe injury or death.

CAUTION

A situation that may lead to mild or moderate injury.

NOTE

A situation that may cause damage to the equipment or loss of property.

INFORMATION

Indicates a useful hint or additional information.

2 SYSTEM INFORMATION

INFORMATION

The equipment must be operated by professionals or trained people, and it is mainly used for commercial purposes such as stores, shopping malls and large office buildings.

This unit can be used for heating/cooling.

NOTE

- Do not use the air conditioning system for other purposes. In order to avoid quality degradation, do not use the unit to cool precision instruments, food, plants, animals or works of art.
- For system maintenance and expansion, please contact professional staff.

3 USER INTERFACE

CAUTION

- Please contact the agent if you need to check and adjust the internal components.
- The figure shown in this manual is for reference only and may be slightly different from the actual product.

This operation manual only provides information on the main functions of this system.

4 BEFORE OPERATING

WARNING

- This unit consists of electrical components and hot parts (danger of electric shock and scald).
- Before you operate this unit, make sure that the installation personnel have installed it properly.
- 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.

CAUTION

- The air outlet must not be directed at any human body as it is not conducive to the person's health to be exposed to long periods of moving cold/hot air.
- If the air conditioner is used together with a device that comes with a burner, make sure the room is fully ventilated to prevent anoxia (oxygen insufficiency).
- Do not operate the air conditioner when applying fumigated insecticide in the room. This may cause chemicals to be deposited inside the unit, and pose a danger to the health of people allergic to chemicals. This unit should only be serviced and maintained by a professional air conditioning service engineer. Incorrect servicing or maintenance can cause electric shock, fire or leakage of water. Contact your dealer for servicing and maintenance.
- A-weighted sound pressure of all the units level are all below 70 dB. This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Cleaning and user maintenance shall not be made by children without supervision.
- The appliance shall be installed in accordance with national wiring regulations.
- This appliance is intended to domestic and used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

This operation manual is suitable for air conditioning systems with standard controls. Before you start the system, please contact the agent for information on the things to note when operating the system. If the installed unit has a custom control system, please ask the agent

for information on the things to note when operating the system. Operating modes of the outdoor unit (depends on the indoor unit):

- Cooling.
- Heatling.
- Mix cooling & heating.

Specialized functions vary with the type of indoor unit. Refer to the installation/user manuals for more information.

- Unit is marked with the following symbols:



This symbol indicates that electrical and electronic products must not be mixed with unsorted household waste. Do not attempt to dismantle the system on your own. All works involved in dismantling the system, handling the refrigerant, oil and other components must be carried out by authorized installation personnel, and the works must be carried out in accordance with the applicable law. The unit must be disposed of and treated at special treatment facilities for reuse, and recycling. By making sure that this product is properly handled and disposed of, you help to minimize the negative impact on the environment and human health. For more information, please contact the installation personnel or local organization.

5 OPERATIONS

5.1 Operating Range

	Cooling mode	Heating mode
Outdoor temperature	-5 (-15')~52°C (DB)	-25~19°C (WB)
Indoor temperature	15~24°C (WB)	15~30°C (DB)
Indoor humidity	≤ 80% ²	
Mix cooling & heating mode		
	Main cooling	Main Heating
Outdoor temperature	-5 (-15')~27°C (DB)	-5 (-15')~19°C (WB)
Indoor temperature	Cooling:15~24°C (WB) Heaing:15~30°C (DB)	Cooling:15~24°C (WB) Heaing:15~30°C (DB)
Indoor humidity	≤ 80% ²	

Notes:

1. -15°C cooling is possible only if the single SDB box (one or more) is used in the system. In case the multi SDB box is used (alone or in combination with single SDB box), the minimum allowable cooling temperature is -5°C.
2. Condensation will form on the unit surface and water dripping out of the unit when the indoor humidity is beyond 80%.
3. The operating range is for VRF indoor units. There will be some differences when high temperature (HT) hydro modules are connected to the system.

NOTE

The temperature should below 55°C during transporing. The safety device will be triggered if the temperature or humidity exceeds these conditions, and the air conditioner may not run.

5.2 Operating System

5.2.1 About the system operations

The operating program varies with different combinations of outdoor unit and controller.

To protect this unit, please turn on the main power supply 12 hours before you start to operate this unit.

If there is a power outage while the unit is running, the unit will automatically restart its operation when the power supply resumes.

5.2.2 Cooling and heating operation of inverter central A/C

The indoor units of this air conditioner can be controlled separately. And the indoor units in the same system can operate in cooling and heating modes simultaneously.

However, the indoor units connected to the same port of the mode selection (SDB) box cannot operate in heating and cooling modes simultaneously. Under such cases:

1. If the first turned on indoor unit is operated in cooling mode, indoor units turned on thereafter in the heating mode will display the "E0" (mode conflict).
2. If the first turned on indoor unit is operated in heating mode, indoor units turned on thereafter in the cooling or fan mode will display the "E0" (mode conflict).

5.2.3 About the heating operation

Compared to the cooling operation, the heating operation takes a longer time.

Need to perform the following operations to prevent the heating capacity from dropping or prevent cold air from coming out of the system.

Defrost Operation

In the heating operation, as the outdoor temperature decreases, frost may be formed on the heat exchanger in the outdoor unit, making it more difficult for the heat exchanger to heat up the air. The heating capacity decreases, and a defrosting operation needs to be performed on the system in order for the system to provide sufficient heat to the indoor unit. At this point, the indoor unit will show the defrost operation on the display screen.

The indoor fan motor will automatically stop running so as to prevent cold air from coming out of the indoor unit when the heating operation starts. This process will take some time. This is not a malfunction.

INFORMATION

- When there is a drop in the external temperature, the heating capacity decreases. If this happens, please use another heating equipment and unit at the same time. (Make sure the room is well ventilated if you are using an equipment that produces fire.) Do not place any equipment that may produce a fire where the air outlets of the unit are or below the unit itself.
- Once the unit starts, it takes some time for the room temperature to rise, as the unit uses a hot air circulation system to heat the room.
- If the hot air rises to the ceiling, causing the ground area to become cold, it is recommended that you use a circulating device (to circulate the indoor air). Please contact the agent for details.

5.2.4 Operating system

1. Press the "switch" button on the controller.
Result: The running light turns on and the system starts to run.

2. Repeatedly press the mode selector on the controller to select the required operation mode.

Stop

Press the "switch" button on the controller again.

Result: The running light is now off, and the system stopped running.

NOTE

Once the unit has stopped running, do not disconnect the power immediately. Wait for at least 10 minutes.

Adjust

Refer to the user manual for the controller on how to set the required temperature, fan speed and air flow direction.

5.3 Using the Dry Program

5.3.1 About the system operations

The function in this program uses the minimum temperature drop (minimum indoor cooling) to bring about a drop in humidity in the room.

In the drying process, the system automatically determines the temperature and fan rotation speed (cannot use the user interface to implement the settings).

5.3.2 Using the dry program

Start

1. Press the switch button on the controller.
Result: The running light turns on and the system starts to run.

2. Repeatedly press the mode selector on the controller.

3. Press the button to adjust the air flow direction (this function is not available for all indoor units).

Stop

4. Press the switch button on the user interface again.
Result: The running light is now off, and the system stopped running.

WARNING

Do not touch the air outlet or the horizontal blade when operating in the fan swing mode. Your fingers may be caught in the unit or the unit may be damaged.

6 MAINTENANCE AND REPAIR

NOTE

- Do not check or repair the unit on your own. Please get relevant professionals to conduct any check or repairs.

Do not use substances like gasoline, diluent, and chemical dust cloth to wipe the operations panel of the controller. This may remove the surface layer of the controller. If the unit is dirty, immerse a cloth in diluted and neutral detergent, squeeze it dry, and then use it to clean the panel. Finally, wipe it with a dry cloth.

WARNING

- When the fuse melts, do not use any unspecified fuse or other wire to replace the original fuse. The use of electrical wires or copper wires may cause the unit to malfunction or cause a fire.
- Do not insert fingers, sticks, or other items into the air inlet or outlet. Do not remove the fan mesh cover. When the fan rotates at a high speed, it may cause bodily injury.
- It is very dangerous to check the unit when the fan is rotating. Make sure you turn off the main switch before any maintenance work begins.
- Do check the supporting and base structure of the unit for any damages after a long period of use. The unit may drop and cause personal injury if there is any damage.

6.1 Maintenance after Unit has been Shut Down for a Long Period

For example, in early summer or winter.

- Check and remove all objects that may clog the air inlets and outlets of the indoor and outdoor units.
- Clean the air filter and external shell of the unit. Please contact the installation or maintenance personnel. The installation/operation manual of the indoor unit includes maintenance tips and cleaning procedures. Make sure that the clean air filter is installed in its original position.
- Turn on the main power supply 12 hours before this unit is operated in order to ensure that the unit runs smoothly. The user interface is displayed once the power is turned on.

6.2 Maintenance Before Unit is Shut Down for a Long Period

For example, at the end of winter and summer.

- Run the indoor unit in the fan mode for about half a day to dry the internal parts of the unit.
- Turn off the power supply.

- Clean the air filter and external shell of the unit. Please contact the installation or maintenance personnel to clean the air filter and external shell of the indoor unit. The installation/operation manual of the specialized indoor unit includes maintenance tips and cleaning procedures. Make sure that the clean air filter is installed in its original position.

6.3 About the Refrigerant

This product contains fluorinated greenhouse gases as stipulated in the Kyoto Protocol. Do not discharge the gas into the atmosphere.

Refrigerant Type: R410A

GWP Value: 2088

Based on the applicable law, the refrigerant must be checked regularly for leakages. Please contact the installation personnel for more information.

WARNING

- The refrigerant in the air conditioner is relatively safer, and usually does not leak. If the refrigerant leaks, and comes in contact with burning objects in the room, it will produce harmful gases.
- Shut down any flammable heating device, ventilate the room and contact the agent of the unit immediately.
- Do not use the air conditioner again until the maintenance personnel has confirmed that the refrigerant leakage has been sufficiently resolved.

6.4 After-sales Service and Warranty

6.4.1 Warranty period

This product contains the warranty card that was completed by the agent during installation. The customer must check the completed warranty card and keep it properly.

If you need to repair the air conditioner during the warranty period, please contact the agent and provide the warranty card.

6.4.2 Recommended maintenance and inspection

As the use of the unit for many years will eventually lead to a dust layer, the performance of the unit will degenerate to a certain extent. As professional skills are needed to dismantle and clean the unit, and for the optimal maintenance effects of this unit, please contact your agent for more details.

When you request the agent for assistance, please remember to state:

- Complete model name of the air conditioner.
- Date of installation.
- Details on the fault symptoms or errors, and any defects.

WARNING

- Do not attempt to modify, dismantle, remove, reinstall or repair this unit, as the improper dismantling or installation may result in electric shock or fire. Please contact the agent.
- If the refrigerant accidentally leaks, make sure that there is no fire around the unit. The refrigerant itself is completely safe, non-toxic and non-flammable, but it will produce toxic gases when it accidentally leaks and comes in contact with flammable substances generated by existing heaters, and burning devices in the room. You must get a qualified maintenance personnel to verify that the point of leakage has been repaired or rectified before you restore the operations of the unit.

6.4.3 Shorter maintenance and replacement cycle

In the following situations, the "maintenance cycle" and "replacement cycle" may be shortened.

The unit is used in the following situations:

- Temperature and humidity fluctuations are outside the normal ranges.
- Large power fluctuations (voltage, frequency, waveform distortion etc.) (must not use the unit if the power fluctuations exceed the allowed range).
- Frequent collisions and vibrations.
- The air may contain dust, salt, harmful gas or oil such as sulphite and hydrogen sulphide.
- Frequent on and off of unit or operating time is too long (in places where the air conditioning is on for 24 hours a day).

7 TROUBLESHOOTING

The warranty does not cover the damage caused by dismantling or cleaning of the internal components by unauthorized agents.

WARNING

- When any unusual situations arises (burning odour, etc.), stop the unit immediately and turn off the power.
- As a result of a certain situation, the unit has caused damage, an electric shock, or a fire. Please contact the agent.

The system maintenance must be carried out by a qualified maintenance personnel:

Error	Measures
If a safety device, such as a fuse, circuit breaker or a leakage circuit breaker is triggered frequently or the ON/OFF switch is not working properly.	Turn off the main power switch.
The operating switch is not functioning normally.	Turn off the power supply.
If the unit number is displayed on the user interface, and the operating indicator is flickering, and an error code is shown on the screen as well.	Notify the installation personnel and report the error code.

Other than the above-mentioned situations, and where the fault is not obvious, if the system continues to malfunction, carry out the following steps to investigate.

Error	Measures
If the system does not run at all.	<p>Check if there is a power failure. Wait for the power supply to be restored. If a power failure occurs when the unit is still running, the system will restart automatically once the power is restored.</p> <p>Check if the fuse is broken or if the circuit breaker is working. If necessary, replace the fuse or reset the circuit breaker.</p>
If the system works fine in the fan-only operating mode but stop running once it enters the heating or cooling operation modes.	<p>Check if the air inlets or outlets of the outdoor or indoor units are blocked by any obstacles. Remove the obstacles, and maintain good ventilation in the room.</p>
The system is running but there is insufficient cooling or heating.	<p>Check if the air inlets or outlets of the outdoor or indoor units are blocked by any obstacles.</p> <p>Remove the obstacles, and maintain good ventilation in the room.</p> <p>Check if the filter is blocked (please refer to the "Maintenance" section in the manual of the indoor unit).</p> <p>Check the temperature settings.</p> <p>Check the fan speed settings on the user interface.</p> <p>Check if the doors and windows are open. Close the doors and windows to shut out wind from the external environment.</p> <p>Check if there are too many people in the room when the cooling mode is in operation. Check if the heat source of the room is too high.</p> <p>Check if there is direct sunlight into the room. Use curtains or blinds.</p> <p>Check that the angle of air flow is appropriate.</p>

7.1 Error Code: Overview

If an error code appears on the unit user, please contact the installation personnel and inform them of the error code, device model, and serial number (you can find the information on the nameplate of this unit).

Displayed Content	Error or protection definition	Remarks
E0	Communication error between outdoor units	Only displayed on the slave unit with the error
E2	Communication error between SDB box and master unit	Only displayed on the the master unit
E4	T3/T4 temperature sensor error	Displayed on the unit with the error
E5	Abnormal power supply voltage	Displayed on the unit with the error
E7	Discharge temperature sensor error (T7C1)	Displayed on the unit with the error
E8	Outdoor unit address error	Displayed on the unit with the error
E9	EEPROM mismatch of compressor	Displayed on the unit with the error
F1	DC bus voltage error	Displayed on the unit with the error
F3	T6B temperature sensor error	Displayed on the unit with the error

Displayed Content	Error or protection definition	Remarks
F5	T6A temperature sensor error	Displayed on the unit with the error
zF6	Electronic expansion valve connection error	Displayed on the unit with the error
F9	T5 temperature sensor error	Displayed on the unit with the error
FA	T8 temperature sensor error	Displayed on the unit with the error
Fb	T9 temperature sensor error	Displayed on the unit with the error
Fc	TL temperature sensor error	Displayed on the unit with the error
Fd	T7 temperature sensor error	Displayed on the unit with the error
H0	Communication error between main board and compressor drive board	Displayed on the unit with the error
H2	Qty. of outdoor unit decreases error	Only displayed on the the master unit
H3	Qty. of outdoor unit increases error	Only displayed on the the master unit
H4	Compressor inverter module protection	Displayed on the unit with the error
H5	Low pressure protection lock out (P2 3X in 60 minutes)	Displayed on the unit with the error
H6	Compressor discharge temperature protection (P4 3X in 100 minutes)	Displayed on the unit with the error
H7	Qty. of indoor units mismatching	Only displayed on the the master unit
H8	High pressure sensor error	Displayed on the unit with the error
xH9	DC fan module protection (P9 10X in 120 minutes)	Displayed on the unit with the error
Hb	Low pressure sensor error	Displayed on the unit with the error
yHd	Slave unit malfunction(y=1,2 ,1Hd stands for slave unit 1 error)	Only displayed on the the master unit
C7	Compressor inverter module temperature protection (PL 3X in 100 minutes)	Displayed on the unit with the error
P1	High pressure protection	Displayed on the unit with the error
P2	Low pressure protection	Displayed on the unit with the error
P31	Primary current protection	Displayed on the unit with the error
P32	Secondary current protection	Displayed on the unit with the error
P4	Discharge temperature protection or discharge temperature switch protection	Displayed on the unit with the error
U0	In the event of S10=ON, a forced test operation is set. However, a test operation is not performed for 30 minutes after power-on	Displayed on the unit with the error
xP9	DC fan module protection	Displayed on the unit with the error
PL	Compressor inverter module temperature protection	Displayed on the unit with the error
PP	Compressor discharge insufficient superheat protection	Displayed on the unit with the error
A0	Emergency stop	Displayed on the unit with the error
A1w	Refrigerant leakage protection	Displayed on the unit with the error
CA2	The system is connected to VRF DX AHU control box only	Displayed on the unit with the error
CA3	The system is connected only to the HT hydro module	Displayed on the unit with the error
CA4	The system is only connected to VRF DX AHU control box + HT hydro module	Displayed on the unit with the error
CA5	The system is simultaneously connected to VRF indoor + VRF DX AHU control box + HT hydro module	Displayed on the unit with the error
Cb1	VRF indoor is beyond the connection range	Displayed on the unit with the error
Cb2	VRF DX AHU control box is beyond the connection range	Displayed on the unit with the error
Cb3	The HT hydro module is beyond the connection range	Displayed on the unit with the error
Cb4	The Qty. of IDUs connected to the system is beyond the connection range	Displayed on the unit with the error
L0	Inverter compressor module error	
L1	DC bus low voltage protection	
L2	DC bus high voltage protection	
L3	Reserved	
L4	MCE error	
L5	Zero speed protection	
L6	Motor parameter error	
L7	Phase sequence error	
L8	Compressor frequency hopping error	
LA	PED software verification failed	

Note:

'x' is a placeholder for the fan address, with 1 representing fan A and 2 representing fan B.

'y' is a placeholder for the address (1 or 2) of the slave unit with the error.

'z' is a number for the electronic expansion valve, with 1 representing electronic expansion valve A and 3 representing electronic expansion valve C.

'w' is a placeholder for the protection mode of refrigerant leakage, with 1 representing the system should force to shutdown after the protection, 2 representing the system should force to shutdown after the protection in 12 hours and 3 representing the system should force to shutdown after the protection in 24 hours.

7.2 Fault Symptom: Non Air Conditioning Issues

The following fault symptoms are not caused by the air conditioning:

7.2.1 Fault symptom: System cannot run

Air conditioner does not start immediately after pressing the switch button on the controller. If the operating indicator lights up, the system is working normally. In order to prevent overloading of the compressor motor, restart the air conditioner 12 minutes after the switch button is pressed to prevent it from shutting down immediately after it is on. The same start-up delay occurs after the mode selector is pressed.

7.2.2 Fault symptom: Fan speed is not consistent with the setting

Even if the fan speed regulation button is pressed, the fan speed does not change. During heating, when the indoor temperature reaches the set temperature, the outdoor unit will shut down, and the indoor unit switches to the quiet fan speed mode. This is to prevent cold air from blowing directly at the room user. The fan speed will not change even when another indoor unit is in heating operation, if the button is pressed.

7.2.3 Fault symptom: Fan direction is not consistent with the setting

The air direction is not consistent with the user interface display. The air direction does not swing. This is because the unit is controlled by the centralized controller.

7.2.4 Fault symptom: White smoke from a certain unit (indoor unit)

During cooling when the humidity is high. If the interior pollution of the indoor unit is severe, the indoor temperature distribution will be uneven. Need to clean the interior of the indoor unit. Ask the agent for detailed information on how to clean the unit. This operation must be carried out by qualified maintenance personnel.

Surface immediately after cooling has stopped and when the indoor humidity is relatively low. This is due to the steam produced by the warm refrigerant gas on its return path to the indoor unit.

7.2.5 Fault symptom: White smoke from a certain unit (indoor unit, outdoor unit)

After the defrosting operation, switch the system to the heating mode. The moisture produced by the defrosting operation will become steam to be discharged out of the system.

7.2.6 Fault symptom: Noise from air conditioner (indoor unit)

A "zeen" sound is heard the moment the system is powered on. This noise is produced by the electronic expansion valves inside the indoor unit as they begin to work. The sound volume will be reduced in about 1 minute.

A soft and continuous "shah" sound can be heard when the system is in a cooling mode or has stopped running. This noise can be heard when the drainage pump is running (optional accessory).

A loud creaking "pishi-pishi" sound can be heard once the system stops after it has heated up the room. The expansion and contraction of plastic parts caused by temperature changes will also make this noise.

Once the indoor unit stops, a soft "sah" or "choro-choro" sound can be heard. This noise can be heard when another indoor unit is still running. Must maintain a small amount of refrigerant flow in order to prevent oil and refrigerant residues in the system.

7.2.7 Fault symptom: Noise from air conditioner (indoor unit, outdoor unit)

A soft, continuous hissing sound can be heard when the system is in cooling or defrosting operation. This is the sound of the refrigerant gas flowing in the indoor and outdoor units.

A hissing sound is heard the moment the system starts or stops operation or after the defrosting operation has been completed. This is the noise produced when the refrigerant flow is stopped or changed.

7.2.8 Fault symptom: Noise from air conditioner (outdoor unit)

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

7.2.9 Fault symptom: Dust and dirt in the unit

When using the unit for the first time. This is because there is dust inside the unit.

7.2.10 Fault symptom: Strange odour from unit

This unit will absorb the odours of rooms, furniture, cigarettes and others, and then disperse the odours again.

Small animals stray into the unit, which can also cause odors.

7.2.11 Fault symptom: ODU fan does not run

In the course of operation. Control speed of fan motor to optimize the product operations.

7.2.12 Fault symptom: Hot air is felt when the indoor unit stops

IF different types of indoor units operating in the same system. When another unit is running, part of the refrigerant will still flow through this unit.

8 CHANGE INSTALLATION SITE

Please contact the agent to dismantle and reinstall all the units. You need specialized skills and technology to move the units.

9 DISPOSAL

This unit uses hydrogen fluorocarbons. Please contact the agent when you want to dispose this unit. Based on the requirements of the law, the collection, transportation and disposal of refrigerants must be in accordance with the regulations governing the collection and destruction of hydrofluorocarbons.

NOTE CONCERNING PROTECTION OF ENVIRONMENT



This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

INFORMATION CONCERNING USED REFRIGERANT MEDIUM

This unit is containing fluorinated gases included in the Kyoto protocol. The maintenance and the liquidation must be carried out by qualified personnel.

Type of refrigerant: R410A

The composition of the cooling medium R410A: (50% HFC-32, 50% HFC-125)

The quantity of the refrigerant: please see the unit label.

The value GWP: 2088 (1 kg R410A = 2,088 t CO₂ eq)

GWP = Global Warming Potential

In case of quality problem or other please contact your local supplier or authorized service center.

Emergency number: 112

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