INSTALLATION INSTRUCTIONS

R454B refrigerant detection
Kit for Furnace and Condensing Units

Thank you very much for purchasing our product.
Before using your unit, please read this manual carefully and keep it for future reference.
The figure shown in this manual is for reference only and may be slightly different from the actual product.

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1 INTRODUCTION

Read this manual thoroughly before operating or servicing this unit.

2 SAFETY

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.
The three types of advisories are defined as follows:

WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE Indicates a situation that could result in equipment or property-damage only accidents.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before instaling/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. Never perform any switching, disconnecting, or voltage testing without proper electrical ppe and arc flash clothing. Ensure electrical meters and equipment are properly rated for intended voltage.

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- All our company personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non- our company personnel should always follow local regulations.

3 COPYRIGHT

This document and the information in it are the property of our company, and may not be used or reproduced in whole or in part without written permission. our company reserves the right to revise this publication at any time, and to make changes to its content without obligation to notify any person of such revision or change.

4 TRADEMARKS

All trademarks referenced in this document are the trademarks of their respective owners.

5 ABOUT THE DETECTION KIT

In the normal use state, the signal used by the wire controller is transmitted to the gas furnace and the external machine after the KIT plate, and the KIT does not affect the signal transmission between the wire controller and the gas furnace and the external machine in the normal use state.

When acoil has an abnormal situation and the refrigerant sensor detects the refrigerant leakage, KIT forces the gas furnace to open the fan, disconnect the gas heating, and shut down the compressor and other signal operations to achieve the purpose of diluting the refrigerant leakage concentration and avoid the occurrence of open flame or other dangers.

5.1 For The Requirements Of Gas Furnaces

In accordance with the latest UL 60335-2-40 regulations, Acoil and gas furnaces are required to meet specific requirements for operating air volume. According to the following formula, the minimum air volume requirements for the operation of the gas furnace can be calculated for the refrigerant charging amount of different Acoil models. If the operating air volume of the gas stove does not meet the minimum air volume requirement, replace the gas stove with another model.

$$Qmin=60 \times mc / LFL$$

Where:

Qmin is the minimum circulation airflow in m^3h;

Mc is the actual refrigerant charge amount in the system in kg;

LFL is the lower flammability limit in kg/m^3

For example,

the LFL of R454B refrigerant is 0.307 kg/m^3, and the minimum refrigerant charge of Acoil with 3 cooling tons capacity is 5.1kg, so the minimum operating air volume of the gas furnace used with Acoil is 997 m^3/h or 586CFM

⚠ CAUTION

Before installing the unit, the service personnel should carefully check the air meter of the gas furnace to check whether it meets the minimum air volume requirements of Acoil, and the installation is prohibited if it does not meet the requirements.

If the system meets the incorporated circulation airflow requirements, the correspondence of the maximum refrigerant charge with the minimum room area (Amin) is shown in Table down.

Amount of refrigerant charged/kg	Qv/m^3/h	Amount of refrigerant charged/kg	Qv/m^3/h
2.0	203	5.2	527
2.2	223	5.4	547
2.4	243	5.6	568
2.6	264	5.8	588
2.8	284	6.0	608
3.0	304	6.2	628
3.2	324	6.4	649
3.4	345	6.6	669
3.6	365	6.8	689
3.8	385	7.0	709
4.0	405	7.2	730
4.2	426	7.4	750
4.4	446	7.6	770
4.6	466	7.8	791
4.8	486	8.0	811
5.0	507		

5.2 Installing The Kit

1. Turn off all power supplies of gas furnace, external engine and wire controller.

2. Open the upper cover of the KIT electric control box, and fix the KIT electric control box on the front or side of Acoil with self-tapping screws. Pay attention to the sponge in the accessory bag between the electric control box and Acoil, as shown in the figure below.

3. According to the wiring diagram, connect the KIT board and the signal cables of the gas furnace, external engine and wire controller respectively. Note that the connection cables should use 18AWG specifications.

4. Install the top cover of the KIT electric control box.

5. Power on the gas furnace and external engine respectively, and check whether the gas furnace and external engine are running normally and whether the KIT board is faulty.

NOTICE

Installation precautions:

(1) When installing the KIT electric control box, do not use screws more than 10mm long to prevent screws from penetrating the glass fiber cotton;

(2) When installing the KIT electric control box, please check the screw position away from the Acoil pipeline;

(3) When mounted on the side, the electric control box can be aligned with the indicating label arrangement, as shown in the figure;

(4) In the side installation, if the drill is installed, the drilling depth should not exceed 5mm to prevent the glass fiber cotton from being hit.

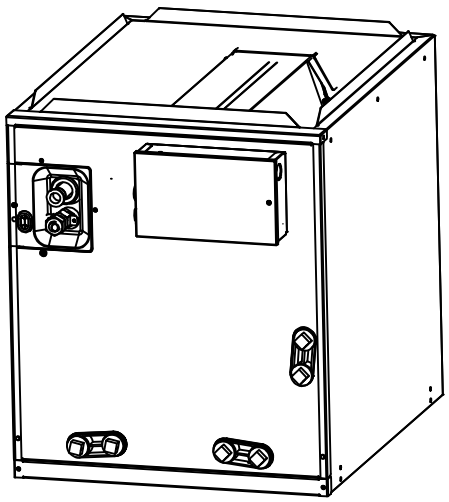


Fig.5-1 Erection view

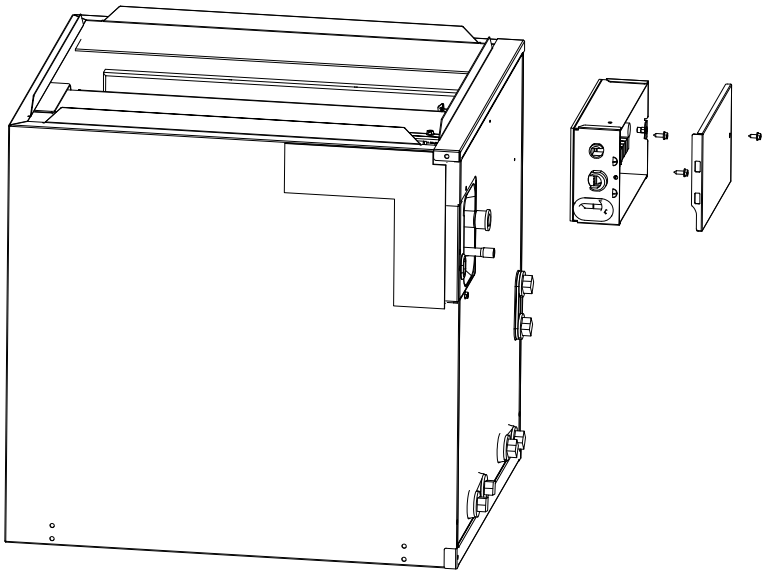


Fig.5-2 Mounting section view

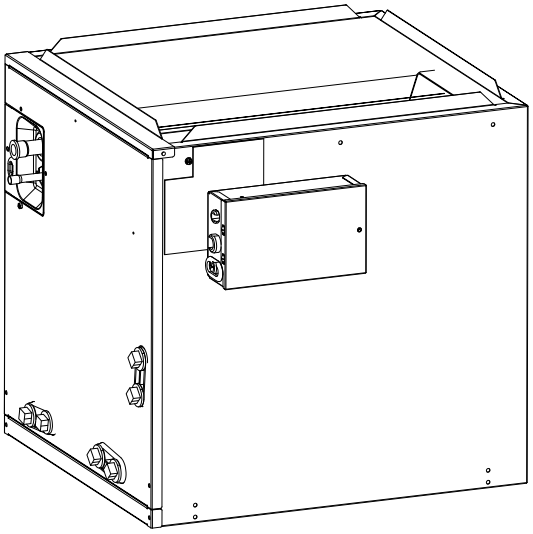


Fig.5-3 Install right view

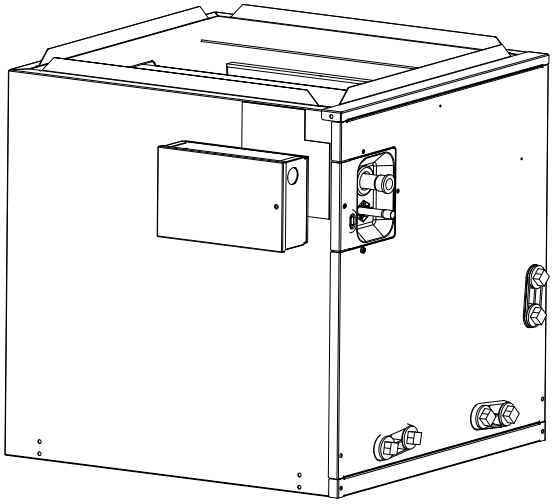


Fig.5-4 Install left view

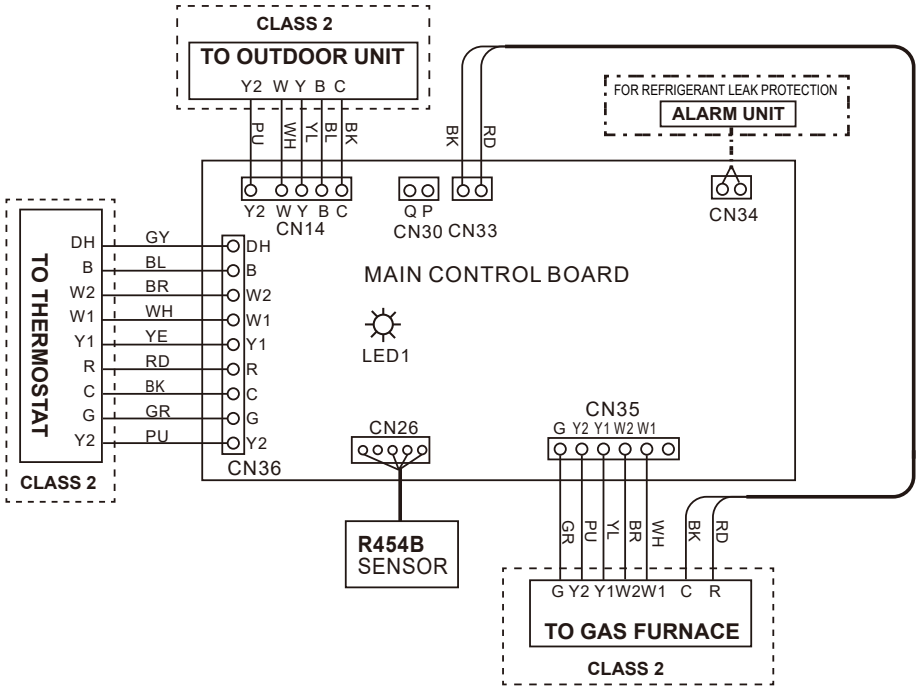
5.3 Function Description Of The Kit Board

When the KIT board detects refrigerant leakage or other operating faults, perform the following operations.

LED1 Number of green flashes	Fault location	Fault cause	Unit response & handling method
1	The refrigerant sensor communication fails.	Fails to communicate with the refrigerant sensor for 30 consecutive seconds or the refrigerant sensor is faulty.	LED1 of the KIT board blinds green once, turns off the cold signal of the external mechanism, shuts down the compressor, forcibly outputs the air supply signal to the gas furnace, turns off the heating signal of the gas furnace, and turns on the highest air gear of the gas furnace. Contact the after-sales personnel of the manufacturer.
2	Refrigerant concentration exceeds the limit alarm value.	The pipe is damaged or the refrigerant leaks.	1, maintain ventilation, cut off the cold signal of the external mechanism, close the compressor to reduce refrigerant circulation, and avoid open flame; 2. Force the output air supply signal, disconnect the heating signal of the gas furnace, and open the highest wind gear of the gas furnace until the refrigerant concentration is reduced to a safe value.
3	The refrigerant sensor is faulty.	The refrigerant leakage sensor determines the fault by itself, such as the sensor's own communication error, and the detection concentration exceeds the limit value.	Turn off the cold signal of the external mechanism, shut down the compressor, force out the air supply signal of the gas furnace, turn off the heating signal of the gas furnace, open the highest air gear of the gas furnace, and replace the new refrigerant detection sensor.
4	Life reminder.	The refrigerant sensor expires.	Turn off the cold signal of the external mechanism, shut down the compressor, force out the air supply signal of the gas furnace, turn off the heating signal of the gas furnace, open the highest air gear of the gas furnace, and replace the new refrigerant detection sensor.

SCHEMATIC DIAGRAM

CAUTION:
DISCONNECT ALL POWER BEFORE SERVICING OR INSTALLING THIS UNIT.



LED1 STATUS	CONTENT
STEADY ON	NORMAL OPERATION
OFF	POWER SUPPLY FAILURE
1 FLASH/CYCLE	**R454B** SENSOR COMMUNICATION ERROR
2 FLASH/CYCLE	REFRIGERANT LEAK PROTECTION
3 FLASH/CYCLE	**R454B** SENSOR ERROR
4 FLASH/CYCLE	**R454B** SENSOR OVER SERVICE LIFE

- - - - - OPTIONAL
- - - - - - FIELD INSTALLED

YL	YELLOW	BL	BLUE
PU	PURPLE	GY	GRAY
GR	GREEN	RD	RED
BR	BROWN	BK	BLACK
WH	WHITE		

NOTES:
1: Use copper wire (75 ℃ min) only between disconnect switch and unit.
2: To be wired in accordance with **NEC** and local codes.
3: If any of the original wire, as supplied, must be replaced. Use the same or equivalent type wire.
4: Connect R to R, G to G, Y to Y, etc. See instruction for details.
5: If some signal lines of **CN36** are not used, please wrap them up separately with **CAP**.
6: **CN33** is the power input position and the rated input voltage is **24 VAC**.
7: The rated operating condition of **ALARM** is **24 VAC/1A** or **30 VDC/1A** or **250 VAC/1A**, please refer to the manual for wiring methods.

Factory code	Date	Revision
16000110023692	Mar. 20th, 2024	C

16123000004053 V.C