This product utilizes **R-454B** *refrigerant*

UNIVERSAL® SERIES

AIR HANDLER SERVICE MANUAL

MODELS:

UAH18*-O

Read this manual carefully before installation and keep it where the operator can easily find it for future reference.

Due to updates and constantly improving performance, the information and instructions within this manual are subject to change without notice.

Version Date: March 20, 2025

Please visit www.mrcool.com/documentation to ensure you have the latest version of this manual.

MRCOOL®

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CONTENTS

1 SAFETY 2
2 SYSTEM OVERVIEW 9
2.1 Model Reference 9
2.2 Dimensional Drawing 9
2.3 Service 10
2.4 Part Names & Functions 11
2.5 Fan Performance 12
2.6 Noise Criterion Curves 22
2.7 Refrigerant System Diagrams 24
2.8 Electrical Wiring Diagrams 25
3 INSTALLATION 34
3.1 Location 34
3.2 Indoor Unit Installation 34
3.3 Downflow & Horizontal Left Install 36
3.4 Vertical Installation 39
3.5 Piping Insulation 41
3.6 Auxiliary Heat 42
3.7 Electrical Wiring 46
4 PRODUCT FEATURES 49
4.1 24V Signal Chart 49
4.2 Safety Features 50
4.3 Advanced Function Setting 58
4.4 Error Diagnosis Without Error Code 61
4.5 Quick Maintenance by Error Code 68
4.6 Troubleshooting by Error Code 70
4.7 Check Procedure 91
5 TEMPERATURE SENSOR RESISTANCE TABLE 92
6 SYSTEM PRESSURE TABLE 94

Safety Precautions

Read Before Using

Incorrect usage may cause serious damage or injury.

The symbols below are used throughout this manual to indicate instructions that should be followed closely or actions that should be avoided to prevent death, injury, and/or property damage.

WARNING	**Indicates the possibility of personal injury or loss of life.**
CAUTION	**Indicates the possibility of property damage or serious consequences.**

WARNINGS FOR PRODUCT INSTALLATION

INSTALLATION MUST BE PERFORMED BY AN AUTHORIZED DEALER OR SPECIALIST. DEFECTIVE INSTALLATION CAN CAUSE WATER LEAKAGE, ELECTRICAL SHOCK, OR FIRE.

******ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED ELECTRICAL TECHNICIAN******

- ***DO NOT*** **install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it could cause fire.**
- ***DO NOT*** **turn on the power until the installation and all work has been completed.**
- ***DO NOT*** **install a unit equipped with an auxiliary electric heater within 3 ft (1 m) of any combustible materials.**

1. Turn off the unit and disconnect the power before performing any installation or repairs. Failure to do so can cause electric shock.
2. Installation must be performed according to the installation instructions. Improper installation could cause water leakage, electrical shock, fire, and could void the warranty. Contact an authorized service technician for repair or maintenance of this unit. This appliance must be installed in accordance with national wiring regulations.
3. Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and/or failure of the unit.
4. Install the unit in a firm location that can support the unit's weight. If the location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.
5. Install the drainage piping according to the instructions in this manual. Improper drainage could cause water damage to your home and/or property.
6. When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.
7. For detailed information of how to install the indoor and outdoor units to their respective supports, please refer to the indoor unit installation and outdoor unit installation sections of this manual.
8. For units with a wireless network function, the USB device access, replacement, and maintenance operations must be carried out by professional staff.
9. Refer to details further in this manual regarding installing the unit to its support.

WARNINGS FOR PRODUCT USE

- ⊘ ***DO NOT*** **insert fingers, rods, or other objects into the air inlet or outlet. This could cause injury, since the fan may be rotating at high speeds.**
- ⊘ ***DO NOT*** **use flammable sprays such as hair spray, lacquer or paint near the unit, as this could cause fire and/or an explosion.**
- ⊘ ***DO NOT*** **operate the unit in places near or around combustible gases. Emitted gas may collect around the unit and cause an explosion.**
- ⊘ ***DO NOT*** **allow children to play with the appliance. Children must be supervised around the unit at all times.**
- ⊘ ***DO NOT*** **operate the unit in a room where it could be exposed to excessive amounts of water, such as a bathroom or laundry room. Exposure to excessive water amounts can cause the electrical components to short circuit.**
- ⊘ ***DO NOT*** **expose your body directly to direct cool airflow from the unit for a prolonged period of time.**

1. If the unit operates abnormally (emits strange noises or a burning smell), immediately turn off the unit and disconnect the power in order to avoid electric shock, fire, and/or injury. Call your local dealer, or MRCOOL® tech support at (270) 366-0457, for further assistance.
2. If the air conditioner is used together with burners or other heating devices, thoroughly ventilate the room in order to avoid an oxygen deficiency.
3. In certain functional environments (such as kitchens and server rooms etc.), the use of specially designed air-conditioning units is highly recommended.
4. This appliance can be used by children (8 years and older) and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge if they have been given instruction concerning the use of the appliance and understand the hazards involved.
5. Improper installation, adjustment, alteration, service, or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer, service agency, or the gas supplier.

ELECTRICAL WARNINGS

******ELECTRICAL WORK MUST BE COMPLETED BY A QUALIFIED ELECTRICAL TECHNICIAN******

- ⊘ ***DO NOT*** **share the power supply with other appliances. The unit must be installed on a dedicated electrical circuit. An improper or insufficient power supply could cause fire and/or electrical shock.**

1. The product must be properly grounded during installation or electrical shock could occur.
2. Appropriate wiring standards, regulations, and the installation manual must be followed for all electrical work.
3. If connecting power to fixed wiring, an all-pole disconnection device must be incorporated in the fixed wiring in accordance with the wiring rules and must meet the following requirements: at least 3 mm of clearances in all poles, a leakage current that may exceed 10 mA, and a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.
4. For all electrical work, fuse the specified cables. Connect cables tightly and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections could overheat, causing fire and/or electrical shock.
5. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
6. All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not properly closed, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
7. Only use the specified wire. If the wire is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified person in order to avoid a hazard.
8. Disconnection must be incorporated in the fixed wiring in accordance with the NEC, CEC, or local codes.

WARNINGS FOR CLEANING & MAINTENANCE

DO NOT **clean the unit with excessive amounts of water.**

DO NOT **clean unit with combustible cleaning agents, as these could cause deformation and/or fire.**

1. Turn off the device and disconnect the power before cleaning. Failure to do this could result in electrical shock.

CAUTION

DO NOT **allow the air conditioner to operate for extended periods of time with the doors or windows open, or in very high humidity.**

DO NOT **operate the air conditioner with wet hands, as this could cause electric shock.**

DO NOT **use device for any other purpose than its intended use.**

DO NOT **climb onto or place objects on top of the outdoor unit.**

1. Make sure that water condensation can drain smoothly and unhindered from the unit.
2. Turn off the unit and disconnect the power if the unit will not be used for an extended period of time.
3. As with any mechanical equipment, contact with sharp metal edges can result in personal injury. Ensure care is taken when handling the unit and any of its accessories by wearing gloves and protective clothing.

NOTE ON FLUORINATED GASES (NOT APPLICABLE FOR R-290 UNITS):

1. This unit contains fluorinated greenhouse gases.
2. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
3. Service, maintenance, and repair of this unit must be performed by a certified technician.
4. Product un-installation and recycling must be performed by a certified technician.
5. When checking the unit for leaks, maintain proper record-keeping of all checks.

FLAMMABLE REFRIGERANT WARNINGS

1. The installation of pipe-work should be kept to a minimum and should be protected from physical damage.
2. Refrigerant pipes should comply with national gas regulations.
3. All mechanical connections and ventilation openings should be kept clear of obstruction.
4. Utilize proper disposal processes based on national regulations.
5. Any person involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
6. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
7. Do not use any means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
8. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
9. Do not allow foreign matter (oil, water, etc.) to enter the piping, and securely seal the opening by pinching, taping, etc.
10. Do not pierce or burn.
11. Refrigerants may not contain an odor.
12. Working procedures that affect safety should only be carried out by competent persons.
13. The unit should be stored in a well-ventilated area where the room size corresponds to the room area as specific for operation, and should be stored so as to prevent potential mechanical damage from occurring.
14. Joints should be tested with detection equipment with a capability of 5 g/year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints should NOT be used in the indoor side of the unit (brazed, welded joint could be used).
15. A leak detection system is installed. The unit must be powered except for service. For units with a refrigerant sensor, the indoor unit will display an error code and emit a buzzing sound, the compressor of the outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code "FHCC". The refrigerant sensor cannot be repaired and can only be replaced by the manufacturer. It should only be replaced with the sensor specified by the manufacturer.
16. Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repairs to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.
17. Work should be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
18. All maintenance staff and others working in the local area should be instructed on the nature of work being carried out. Avoid work in confined spaces.
19. The area should be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed, or intrinsically safe.
20. If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment should be on site and readily available. Have a dry power or CO2 fire extinguisher adjacent to the charging area.
21. No person carrying out work in relation to a refrigerating system which involves exposing any pipe work should use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing, and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs should be displayed.
22. Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

FLAMMABLE REFRIGERANT WARNINGS

23. Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manfacturer's maintenance ad service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks should be applied to installations using flammable refrigerants:
    - the actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
    - the ventilation machinery and outlets are operating adequately and are not obstructed;
    - if an indirect refrigerating circuit is being used, the secondary circuits should be checked for the presence of refrigerant;
    - marking to the equipment continues to be visible and legible, marking and signs that are illegible should be corrected;
    - refrigeration pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
24. Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution should be used.
25. Initial safety checks should include:
    - that capacitors are discharged: this should be done in a safe manner to avoid the possibility of sparking;
    - that there are no live electrical components and wiring are exposed while charging, recovering, or purging the system;
    - that there is continuity of earth bonding.
26. Sealed electrical components should be replaced if damaged.
27. Intrinsically safe components should be replaced if damaged.
28. Check that wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.
29. Under no circumstances should potential sources of ignition be used in the search for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) should not be used.

The following leak detection methods are deemed acceptable for refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and should be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% minimum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine may react with the refrigerant and corrode the copper work. Examples of leak detection fluids are the bubble method, fluorescent method agents, etc. If a leak is suspected, all naked flames should be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant should be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak. See the following instructions of removal of refrigerant.

30. When breaking into the refrigerant circuit to make repairs, or for any other purpose, conventional procedures should be used. However, for flammable refrigerants, it is even more vital to follow best practice. The following procedure should be adhered to:
    - safely remove refrigerant following local and national regulations;
    - evacuate;
    - purge the circuit with inert gas;
    - evacuate;
    - continuously flush or purge with inert gas when using flame to open circuit;
    - open the circuit

FLAMMABLE REFRIGERANT WARNINGS

31. The refrigerant charge should be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For units containing flammable refrigerants, the system should be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. For appliances containing flammable refrigerants, refrigerant purging should be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process should be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system should be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump should not be close to any potential ignition sources, and ventilation should be available.
32. In addition to conventional charging procedures, the following requirements should be followed:
    - Work should be undertaken with appropriate tools only (in case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants).
    - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as shot as possible to minimize the amount of refrigerant contained in them.
    - Cylinders should be kept upright.
    - Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
    - Label the system when charging is complete (if not already).
    - Extreme care should be taken not to overfill the refrigeration system.
    - Prior to recharging the system, it should be pressure tested with oxygen-free nitrogen (OFN). The system should 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.
33. Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is good recommended practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample should be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.
    a. Become familiar with the equipment and its operation.
    b. Isolate the system electrically.
    c. Before attempting the procedure ensure that:
        - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
        - all personal protective equipment is available and being used correctly;
        - the recovery process is supervised at all times by a competent person;
        - recovery equipment and cylinders conform to the appropriate standards

    d. Pump down refrigerant system, if possible.
    e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
    f. Make sure that the cylinder is situated on the scales before recovery takes place.
    g. Start the recovery machine and operate in accordance with instructions.
    h. Do not overfill cylinders (no more than 80% volume liquid charge).
    i. Do not exceed the maximum working pressure of the cylinder, even temporarily.
    j. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and equipment are removed from the site promptly and all isolation valves on the equipment are closed off.
    k. Recovered refrigerant should not be charged into another refrigeration system unless it has been cleaned and checked.
34. Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label should be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

FLAMMABLE REFRIGERANT WARNINGS

35. When removing refrigerant from a system, either for servicing or decommissioning, it is good recommended practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used should be designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs. The recovery equipment should be in good working order with a set of instructions concerning the equipment that is at hand and should be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales should be available and in good working order. Hoses should be complete with leak-free disconnect couplings and in good condition. The recovered refrigerant should be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body should not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it should be carried out safely.
36. An unventilated area where the appliance using flammable refrigerants is installed should be constructed so that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard. If appliances connected via an air duct system to one or more rooms below the ventilation requirements, that room should never contain potential ignition sources. A flame-producing device may be installed in the space if the device is provided with an effective flame arrest. Auxiliary devices which may be a potential ignition source should not be installed in the duct work. Examples of such are hot surfaces with a temperature exceeding 1292°F (700°C) and electric switching devices. Only auxiliary devices (such as a certified heater kit) approved by the manufacturer or declared suitable with the refrigerant should be installed in connecting ductwork. False or drop ceilings may be used as a return air plenum if a refrigerant detection system is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint. Refrigerant sensors for refrigerant detection systems should only be replaced with sensors specified by the manufacturer. A leak detection system is installed. The unit must be powered except for service.
37. Transport of equipment containing flammable refrigerants should comply with transportation regulations.
38. Marking of equipment using signs should comply with local regulations.
39. Disposal of equipment using flammable refrigerants should comply with national regulations.
40. Storage of equipment/appliances should be in accordance with the manufacturer's instructions.
41. Storage of packed (unsold) equipment should be constructed so that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge. The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

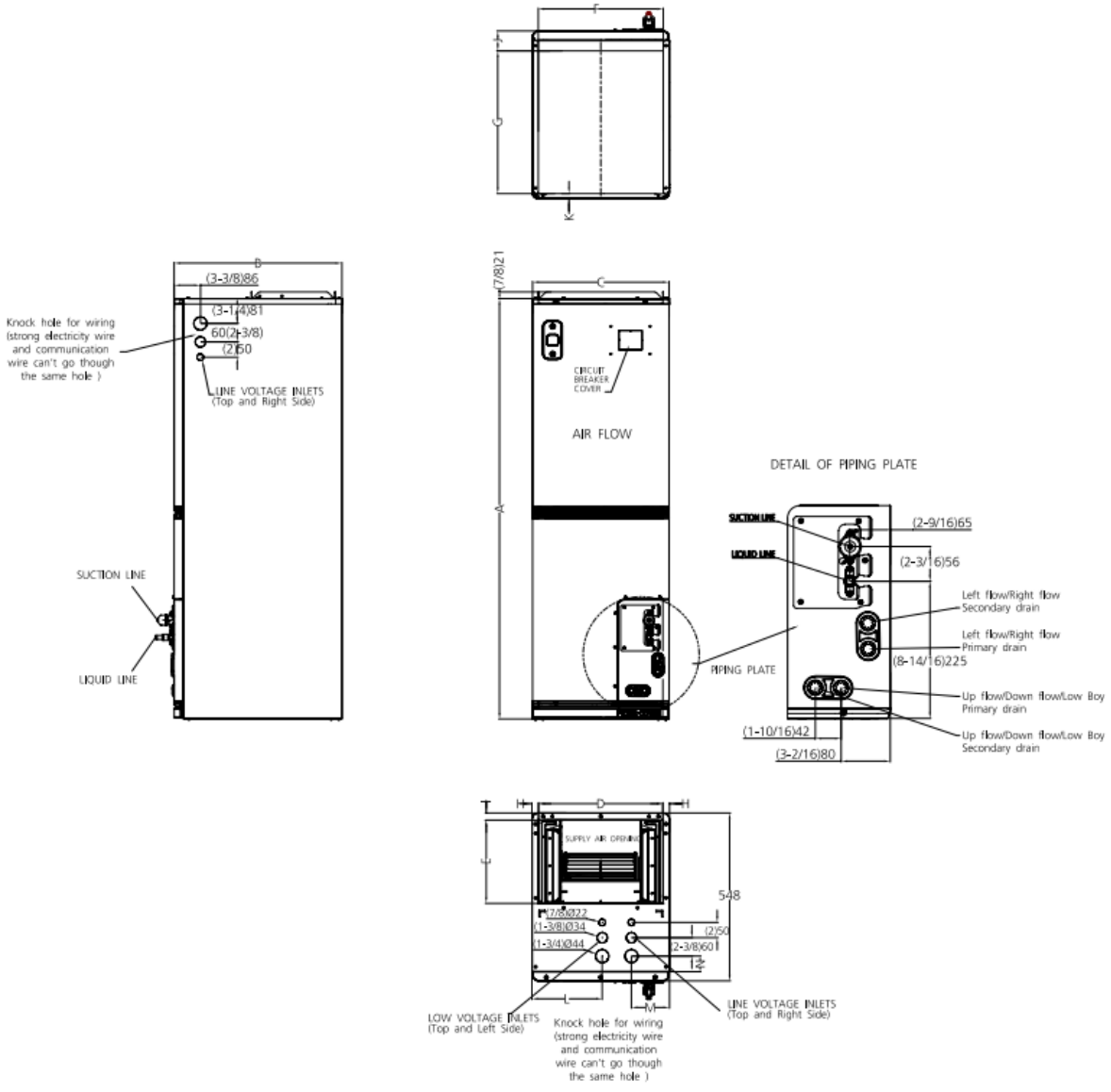
Symbols Displayed on Indoor & Outdoor Unit		
	**WARNING**	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	**CAUTION**	This symbol shows that the operation manual should be read carefully.
	**CAUTION**	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	**CAUTION**	
	**CAUTION**	This symbol shows that information is available such as the operating manual or installation manual.

2.1 Model Reference

Indoor Unit Model	Capacity (Btu/h)	Power Supply
UAH18024-O	24K	1 Phase, 115/208/230V~, 60Hz,
UAH18030-O	30K	
UAH18036-O	36K	
UAH18048-O	48K	
UAH18060-O	60K	

Note: Auxiliary heat cannot be installed when the power supply is 115V.

2.2 Dimensional Drawing

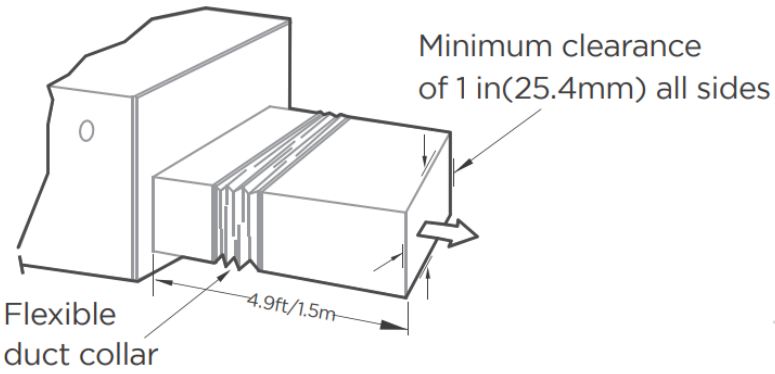


Dimensions	Model	24K		30K/36K		48K/60K	
		inch	mm	inch	mm	inch	mm
A	Model Height	49-3/4	1263	54	1371	56	1421
B	Model Depth	21-1/2	546	21-1/2	546	21-1/2	546
C	Model Width	13	330	16	407	20	508
D	Supply Air Opening Width	13	330	16	407	20	508
E	Supply Air Opening Depth	10-1/4	273	10-1/4	273	10-1/4	273
F	Return Air Opening Width	13	331	16	407	20	509
G	Return Air Opening Depth	18-5/16	465	18-5/16	465	18-5/16	465
H	Supply Air Opening Clearance	7/8	22	7/8	22	7/8	22
I	Supply Air Opening Clearance	15/16	24	15/16	24	15/16	24
J	Return Air Opening Clearance	2-9/16	65	2-9/16	65	2-9/16	65
K	Return Air Opening Back Clearance	5/8	16	5/8	16	5/8	16
L		/	/	9	229	10-13/16	275
M		4-7/16	113	4-7/8	124	5-3/16	131
N		2	51	2	51	1-5/8	41

2.3 Service

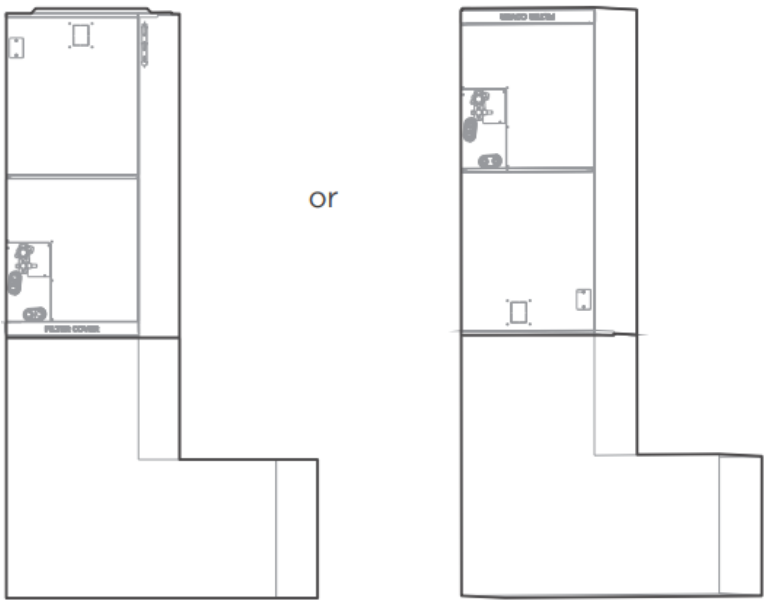
The distance between the mounted indoor unit should meet the specifications illustrated in the following diagram.

Horizontal Installations:

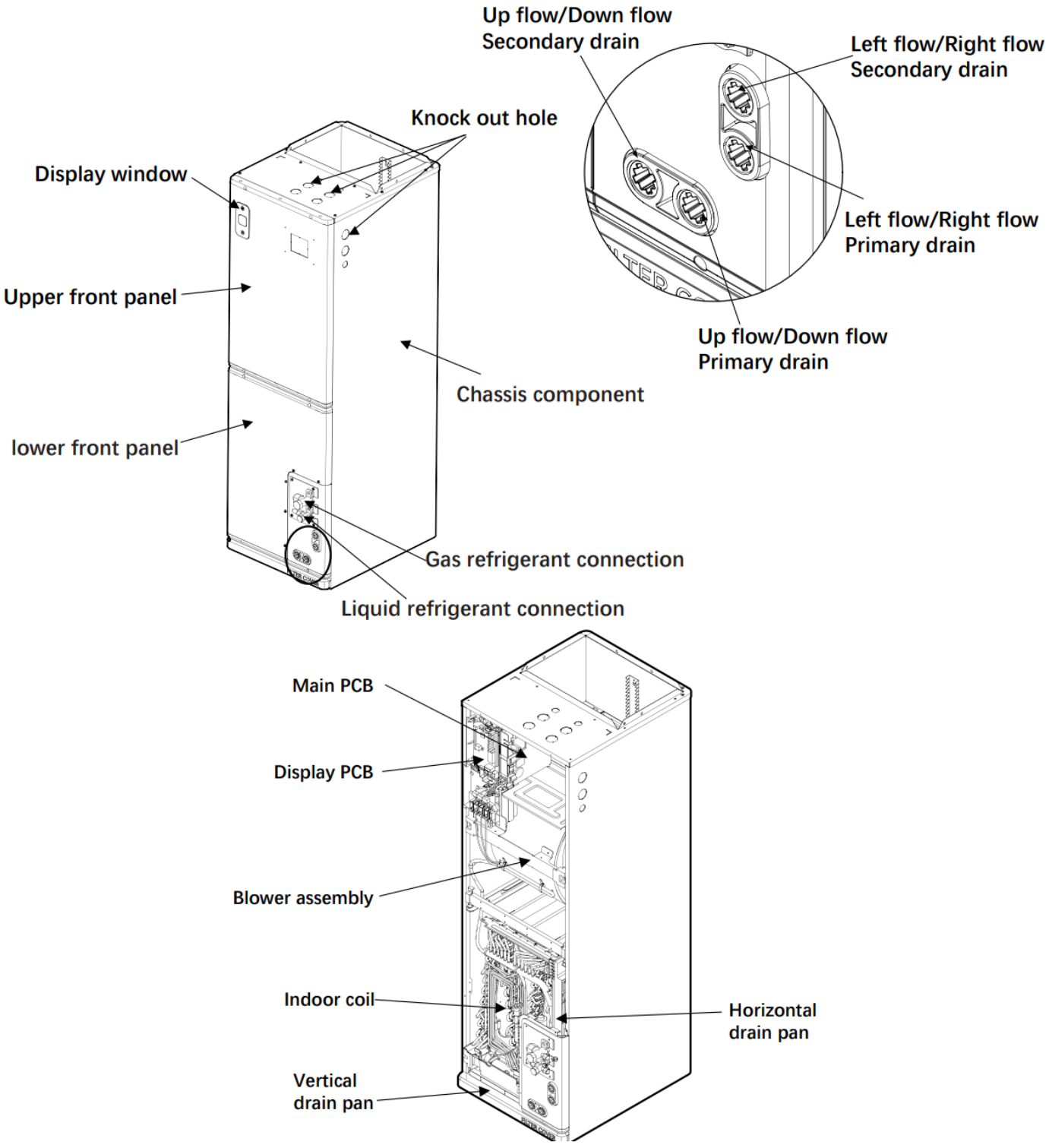


The outlet side pipe length 4.9ft/1.5m.

Vertical Installations:



2.4 Part Names & Functions

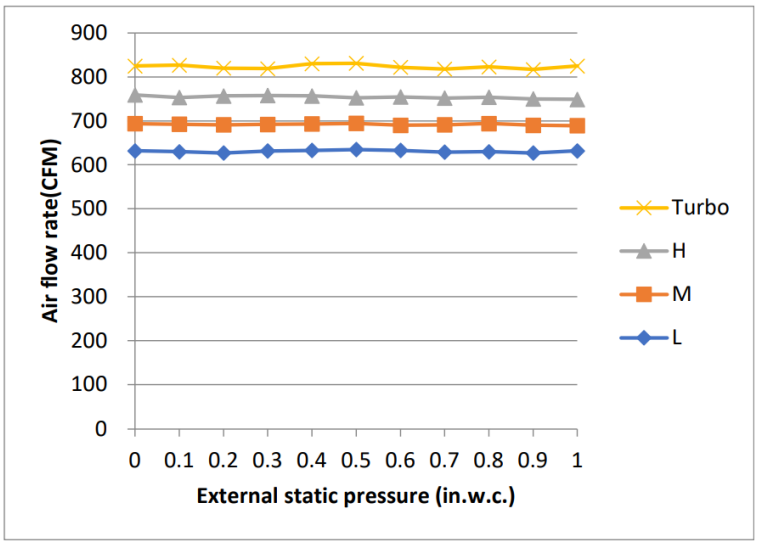


2.5 Fan Performance

NOTE

This system includes a 24V thermostat and no remote control. Some of the error codes and troubleshooting steps require a remote for code reading and parameter adjustment. If you do not have access to a remote, please disregard those error codes and parameter changes.

24K Vertical, Horizontal Right, Horizontal Left:



Use the remote controller:

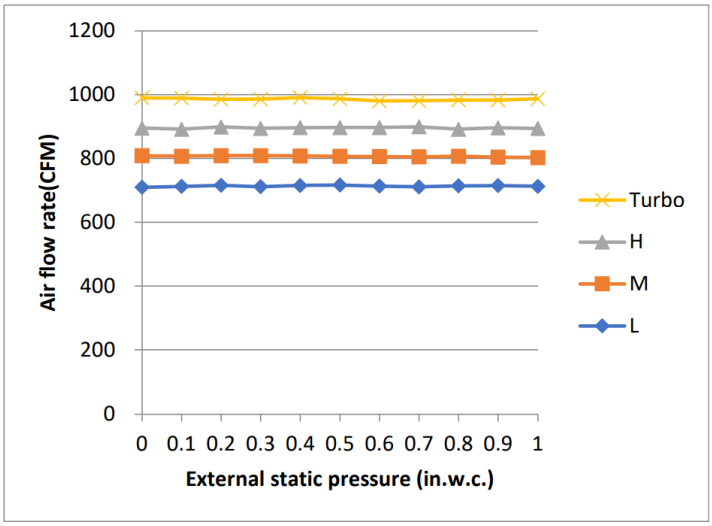
1. The indoor unit needs to be turned off for 5 minutes then powered on (all settings need to be finished within 10 minutes).
2. Push ON/OFF and FAN SPEED together for 7 seconds to enter engineering mode.
3. Choose channel 23 (for cooling) and 25 (for heating) with UP and Down buttons.
4. After choosing channel 23 or 25 push ON/OFF for 2 seconds to select -41,-40,.....,-1,0,1,2,3,....,19,20 (reference the matrix list to identify the relative CFM)
5. Push the OK button to confirm the adjustment value, the display board will display CS (means success for the setting) then disconnect power after 5 seconds.

Cooling	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Turbo	988	804	784	764	744	724	704	684	664	644	624
High	894	739	719	699	679	659	639	619	599	579	559
Medium	806	674	654	634	614	594	574	554	534	514	494
Low	712	609	589	569	549	529	509	489	469	449	429
Cooling	**Default**	**-11**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19 ~ -40**	**+1**
Turbo	988	604	584	564	544	524	504	484	464	453	844
High	894	539	519	499	479	459	439	435	435	435	799
Medium	806	474	454	434	418	418	418	418	418	418	714
Low	712	409	400	400	400	400	400	400	400	400	649

Cooling	Default	+2	+3	+4	+5	+6	+7	+8	+9 ~ +20		
Turbo	988	853	853	853	853	853	853	853	853		
High	894	799	819	835	835	835	835	835	835		
Medium	806	734	754	774	794	814	818	818	818		
Low	712	669	689	709	729	749	769	789	800		

Heating	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11
Turbo	788	768	748	728	708	688	668	648	628	608	588	568
High	753	733	713	693	673	653	633	613	593	573	553	533
Medium	641	621	601	581	651	541	521	501	481	461	441	421
Low	524	504	484	646	444	424	404	400	400	400	400	400
Heating	**Default**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17 ~ -40**	**+1**	**+2**	**+3**	**+4**	**+5**
Turbo	788	548	528	508	488	468	453	808	828	848	853	853
High	753	513	493	473	453	435	435	773	793	813	833	835
Medium	641	418	418	418	418	418	418	661	681	701	721	741
Low	524	400	400	400	400	400	400	544	564	584	604	624
Heating	**Default**	**+6**	**+7**	**+8**	**+9**	**+10**	**+11**	**+12**	**+13**	**+14 ~ +20**		
Turbo	788	853	853	853	853	853	853	853	853	853		
High	753	835	835	835	835	835	835	835	835	835		
Medium	641	761	781	801	818	818	818	818	818	818		
Low	524	644	664	684	704	724	744	764	784	800		

30K Vertical, Horizontal Right, Horizontal Left:



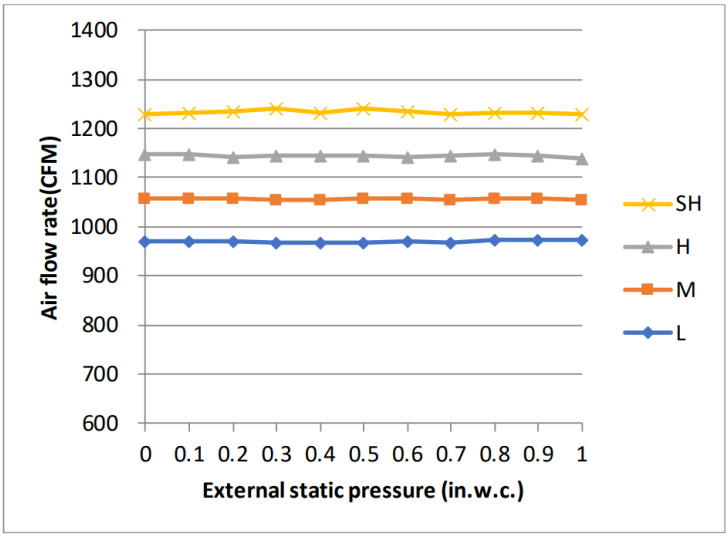
Use the remote controller:

1. The indoor unit needs to be turned off for 5 minutes then powered on (all settings need to be finished within 10 minutes).
2. Push ON/OFF and FAN SPEED together for 7 seconds to enter engineering mode.
3. Choose channel 23 (for cooling) and 25 (for heating) with UP and Down buttons.
4. After choosing channel 23 or 25 push ON/OFF for 2 seconds to select -41,-40,.....,-1,0,1,2,3,....,19,20 (reference the matrix list to identify the relative CFM)
5. Push the OK button to confirm the adjustment value, the display board will display CS (means success for the setting) then disconnect power after 5 seconds.

Cooling	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11
Turbo	988	968	948	928	908	888	868	848	828	808	788	768
High	894	874	854	834	814	794	774	754	734	714	694	674
Medium	806	786	766	746	726	706	686	666	646	626	606	586
Low	712	692	672	652	632	612	592	572	552	532	512	492
Cooling	**Default**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**	**-21**	**-22**
Turbo	988	748	728	708	688	668	648	628	608	588	568	548
High	894	654	634	614	594	574	554	534	514	494	474	454
Medium	806	566	546	526	506	486	466	466	426	418	418	418
Low	712	472	452	432	412	400	400	400	400	400	400	400
Cooling	**Default**	**-23**	**-24**	**-25**	**-26**	**-27~-41**	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**
Turbo	988	528	508	488	468	453	1008	1028	1048	1068	1071	1071
High	894	435	435	435	435	435	914	934	954	974	994	1014
Medium	806	418	418	418	418	418	826	846	866	886	906	926
Low	712	400	400	400	400	400	732	752	772	792	812	832
Cooling	**Default**	**+7**	**+8**	**+9**	**+10**	**+11**	**+12**	**+13**	**+14**	**+15**	**+16**	**+17~+20**
Turbo	988	1071	1071	1071	1071	1071	1071	1071	1071	1071	1071	1071
High	894	1034	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053
Medium	806	946	966	986	1006	1026	1035	1035	1035	1035	1035	1035
Low	712	852	872	892	912	932	952	972	992	1012	1018	1018

Heating	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11
Turbo	988	968	948	928	908	888	868	848	828	808	788	768
High	894	874	854	834	814	794	774	754	734	714	694	674
Medium	806	786	766	746	726	706	686	666	646	626	606	586
Low	712	692	672	652	632	612	592	572	552	532	512	492
Heating	**Default**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**	**-21**	**-22**
Turbo	988	748	728	708	688	668	648	628	608	588	568	548
High	894	654	634	614	594	574	554	534	514	494	474	454
Medium	806	566	546	526	506	486	466	446	426	418	418	418
Low	712	472	452	432	412	400	400	400	400	400	400	400
Heating	**Default**	**-23**	**-24**	**-25**	**-26**	**-27~-41**	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**
Turbo	988	528	508	488	468	453	1008	1028	1048	1068	1071	1071
High	894	435	435	435	435	435	914	934	954	974	994	1014
Medium	806	418	418	418	418	418	826	846	866	886	906	926
Low	712	400	400	400	400	400	732	752	772	792	812	832
Heating	**Default**	**+7**	**+8**	**+9**	**+10**	**+11**	**+12**	**+13**	**+14**	**+15**	**+16**	**+17~+20**
Turbo	988	1071	1071	1071	1071	1071	1071	1071	1071	1071	1071	1071
High	894	1034	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053
Medium	806	946	966	986	1006	1026	1035	1035	1035	1035	1035	1035
Low	712	852	872	892	912	932	952	972	992	1012	1018	1018

36K Vertical, Horizontal Right, Horizontal Left:



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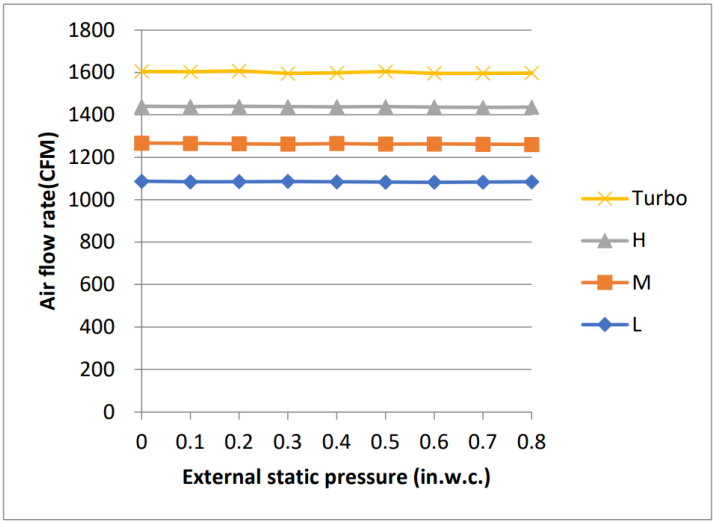
2. Push ON/OFF and FAN SPEED together for 7 seconds to enter engineering mode.
3. Choose channel 23 (for cooling) and 25 (for heating) with UP and Down buttons.
4. After choosing channel 23 or 25 push ON/OFF for 2 seconds to select -41,-40,.....,-1,0,1,2,3,....,19,20 (reference the matrix list to identify the relative CFM)
5. Push the OK button to confirm the adjustment value, the display board will display CS (means success for the setting) then disconnect power after 5 seconds.

Cooling	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12
Turbo	1235	1215	1195	1175	1155	1135	1115	1095	1075	1055	1035	1015	995
High	1147	1127	1107	1087	1067	1047	1027	1007	987	967	947	927	907
Medium	1059	1039	1019	999	979	959	939	919	899	879	859	839	819
Low	971	951	931	911	891	871	851	831	811	791	771	751	731
Cooling	**Default**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**	**-21**	**-22**	**-23**	**-24**
Turbo	1235	975	955	935	915	895	875	855	835	815	795	775	755
High	1147	887	867	847	827	807	787	767	747	727	707	687	667
Medium	1059	799	779	759	739	719	699	679	659	639	619	599	579
Low	971	711	691	671	651	631	611	591	571	551	531	511	491

Cooling	Default	-25	-26	-27	-28	-29	-30	-31	-32	-33	-34	-35	-36
Turbo	1235	735	715	695	675	655	635	615	595	575	555	535	515
High	1147	647	627	607	587	567	547	527	507	487	467	447	435
Medium	1059	559	539	519	499	479	459	439	419	418	418	418	418
Low	971	471	451	431	411	400	400	400	400	400	400	400	400
Cooling	**Default**	**-37**	**-38**	**-39**	**-40~-41**	**+1**	**+2**	**+3**	**+4**	**+4**	**+5**	**+6**	**+7**
Turbo	1235	495	475	455	453	1255	1275	1288	1288	1288	1288	1288	1288
High	1147	435	435	435	435	1167	1187	1207	1227	1247	1267	1271	1271
Medium	1059	418	418	418	418	1079	1099	1119	1139	1159	1179	1199	1191
Low	971	400	400	400	400	991	1011	1031	1051	1071	1091	1111	1085
Cooling	**Default**	**+8**	**+9**	**+10**	**+11**	**+12**	**+13**	**+14~+20**					
Turbo	1235	1288	1288	1288	1288	1288	1288	1288					
High	1147	1271	1271	1271	1271	1271	1271	1271					
Medium	1059	1219	1239	1253	1253	1253	1253	1253					
Low	971	1131	1151	1171	1191	1211	1231	1235					

Heating	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12
Turbo	1235	1215	1195	1175	1155	1135	1115	1095	1075	1055	1035	1015	995
High	1147	1127	1107	1087	1067	1047	1027	1007	987	967	947	927	907
Medium	1059	1039	1019	999	979	959	939	919	899	879	859	839	819
Low	971	951	931	911	891	871	851	831	811	791	771	751	731
Heating	**Default**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**	**-21**	**-22**	**-23**	**-24**
Turbo	1235	975	955	935	915	895	875	855	835	815	795	775	755
High	1147	887	867	847	827	807	787	767	747	727	707	687	667
Medium	1059	799	779	759	739	719	69	679	659	639	619	599	579
Low	971	711	691	671	651	631	611	591	571	551	531	511	491
Heating	**Default**	**-25**	**-26**	**-27**	**-28**	**-29**	**-30**	**-31**	**-32**	**-33**	**-34**	**-35**	**-36**
Turbo	1235	735	715	695	675	655	635	615	595	575	555	535	515
High	1147	647	627	607	587	567	547	527	507	487	467	447	435
Medium	1059	559	539	519	499	479	459	439	419	418	418	418	418
Low	971	471	451	431	411	400	400	400	400	400	400	400	400
Heating	**Default**	**-37**	**-38**	**-39**	**-40~-41**	**+1**	**+2**	**+3**	**+4**	**+4**	**+5**	**+6**	**+7**
Turbo	1235	495	475	455	453	1255	1275	1288	1288	1288	1288	1288	1288
High	1147	435	435	435	435	1167	1187	1207	1227	1247	1267	1271	1271
Medium	1059	418	418	418	418	1079	1099	1119	1139	1159	1179	1199	1191
Low	971	400	400	400	400	991	1011	1031	1051	1071	1091	1111	1085
Heating	**Default**	**+8**	**+9**	**+10**	**+11**	**+12**	**+13**	**+14~+20**					
Turbo	1235	1288	1288	1288	1288	1288	1288	1288					
High	1147	1271	1271	1271	1271	1271	1271	1271					
Medium	1059	1219	1239	1253	1253	1253	1253	1253					
Low	971	1131	1151	1171	1191	1211	1231	1235					

48K Vertical, Horizontal Right, Horizontal Left:



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4. After choosing channel 23 or 25 push ON/OFF for 2 seconds to select -41,-40,.....,-1,0,1,2,3,....,19,20 (reference the matrix list to identify the relative CFM)
5. Push the OK button to confirm the adjustment value, the display board will display CS (means success for the setting) then disconnect power after 5 seconds.

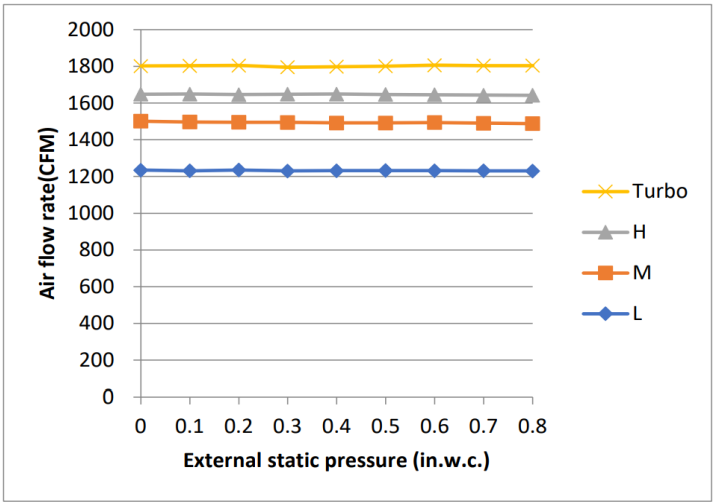
Cooling	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Turbo	1600	1580	1560	1540	1520	1500	1480	1460	1440	1420	1400
High	1441	1421	1401	1381	1361	1341	1321	1301	1281	1261	1241
Medium	1265	1245	1225	1205	1185	1165	1145	1125	1105	1085	1065
Low	1088	1068	1048	1028	1008	988	968	948	928	908	888
Cooling	**Default**	**-11**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**
Turbo	1600	1380	1360	1340	1320	1300	1280	1260	1240	1220	1200
High	1441	1221	1201	1181	1161	1141	1121	1101	1081	1061	1041
Medium	1265	1045	1025	1005	985	965	945	925	905	885	865
Low	1088	868	848	828	808	788	768	748	728	708	694
Cooling	**Default**	**-21**	**-22**	**-23**	**-24**	**-25**	**-26**	**-27**	**-28**	**-29**	**-30**
Turbo	1600	1180	1160	1140	1120	1100	1080	1060	1040	1020	1000
High	1441	1021	1001	981	961	941	921	901	881	961	841
Medium	1265	845	825	805	785	765	745	725	712	712	712
Low	1088	694	694	694	694	694	694	694	694	694	694

Cooling	Default	-31	-32	-33	-34	-35	-36	-37	-38	-39	-40	-41
Turbo	1600	980	960	940	920	900	880	860	840	820	800	780
High	1441	821	801	781	761	741	729	729	729	729	729	
Medium	1265	712	712	712	712	712	712	712	712	712	712	
Low	1088	694	694	694	694	694	694	694	694	694	694	

Cooling	Default	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Turbo	1600	1620	1640	1660	1680	1700	1720	1724	1724	1724	1724
High	1441	1461	1481	1501	1521	1541	1561	1581	1601	1621	1641
Medium	1265	1285	1305	1325	1345	1365	1385	1405	1425	1445	1465
Low	1088	1108	1128	1148	1168	1188	1208	1228	1248	1268	1288
Cooling	**Default**	**+11**	**+12**	**+13**	**+14**	**+15**	**+16**	**+17**	**+18**	**+19**	**+20**
Turbo	1600	1724	1724	1724	1724	1724	1724	1724	1724	1724	1724
High	1441	1661	1681	1701	1706	1706	1706	1706	1706	1706	1706
Medium	1265	1485	1505	1525	1545	1565	1585	1605	1625	1645	1665
Low	1088	1308	1328	1348	1368	1388	1408	1428	1448	1468	1488

Heating	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Turbo	1471	1451	1431	1411	1391	1371	1351	1331	1311	1291	1271
High	1324	1304	1284	1264	1244	1224	1204	1184	1164	1144	1124
Medium	1147	1127	1107	1087	1067	1047	1027	1007	987	967	947
Low	971	951	931	911	891	871	851	831	811	791	771
Heating	**Default**	**-11**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**
Turbo	1471	1251	1231	1211	1191	1171	1151	1131	1111	1091	1071
High	1324	1104	1084	1064	1044	1024	1004	984	964	944	924
Medium	1147	927	907	887	867	847	827	807	787	767	747
Low	971	751	731	711	694	694	694	694	694	694	694
Heating	**Default**	**-21**	**-22**	**-23**	**-24**	**-25**	**-26**	**-27**	**-28**	**-29**	**-30**
Turbo	1471	1051	1031	1011	991	971	951	931	911	891	871
High	1324	904	884	864	844	824	804	784	764	744	729
Medium	1147	727	712	712	712	712	712	712	712	712	712
Low	971	694	694	694	694	694	694	694	694	694	694
Heating	**Default**	**-31**	**-32**	**-33**	**-34**	**-35**	**-36**	**-37**	**-38**	**-39**	**-40~-41**
Turbo	1471	851	831	811	791	771	751	747	747	747	747
High	1324	729	729	729	729	729	729	729	729	729	729
Medium	1147	712	712	712	712	712	712	712	712	712	712
Low	971	694	694	694	694	694	694	694	694	694	694
Heating	**Default**	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**	**+7**	**+8**	**+9**	**+10**
Turbo	1471	1491	1511	1531	1551	1571	1591	1611	1631	1651	1671
High	1324	1344	1364	1384	1404	1424	1444	1464	1484	1504	1524
Medium	1147	1167	1187	1207	1227	1247	1267	1287	1307	1327	1347
Low	971	991	1011	1031	1051	1071	1091	1111	1131	1151	1171
Heating	**Default**	**+11**	**+12**	**+13**	**+14**	**+15**	**+16**	**+17**	**+18**	**+19**	**+20**
Turbo	1471	1691	1711	1724	1724	1724	1724	1724	1724	1724	1724
High	1324	1544	1564	1584	1604	1624	1644	1664	1684	1704	1706
Medium	1147	1367	1387	1407	1427	1447	1467	1487	1507	1527	1547
Low	971	1191	1211	1231	1251	1271	1291	1311	1331	1351	1371

60K Vertical, Horizontal Right, Horizontal Left:



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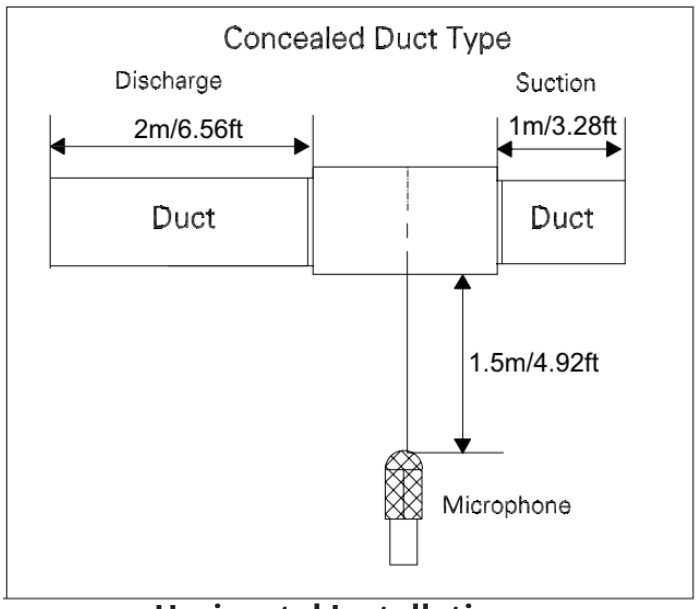
Cooling	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	
Turbo	1800	1780	1760	1740	1720	1700	1680	1660	1640	1620	1600	
High	1647	1627	1607	1587	1567	1547	1527	1507	1487	1467	1447	
Medium	1500	1480	1460	1440	1420	1400	1380	1360	1340	1320	1300	
Low	1235	1215	1195	1175	1155	1135	1115	1095	1075	1055	1035	
Cooling	**Default**	**-11**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**	
Turbo	1800	1580	1560	1540	1520	1500	1480	1460	1440	1420	1400	
High	1647	1427	1407	1387	1367	1347	1327	1307	1287	1267	1247	
Medium	1500	1280	1260	1240	1220	1200	1180	1160	1140	1120	1100	
Low	1235	1015	995	975	955	935	915	895	875	855	835	
Cooling	**Default**	**-21**	**-22**	**-23**	**-24**	**-25**	**-26**	**-27**	**-28**	**-29**	**-30**	
Turbo	1800	1380	1360	1340	1320	1300	1280	1260	1240	1220	1200	
High	1647	1227	1207	1187	1167	1147	1127	1107	1087	1067	1047	
Medium	1500	1080	1060	1040	1020	1000	980	960	940	920	900	
Low	1235	815	795	775	755	735	715	695	694	694	694	
Cooling	**Default**	**-31**	**-32**	**-33**	**-34**	**-35**	**-36**	**-37**	**-38**	**-39**	**-40**	**-41**
Turbo	1800	1180	1160	1140	1120	1100	1080	1060	1040	1020	1000	980
High	1647	1027	1007	987	967	947	927	907	887	867	847	827
Medium	1500	880	860	840	820	800	780	760	740	720	712	
Low	1235	694	694	694	694	694	694	694	694	694	694	

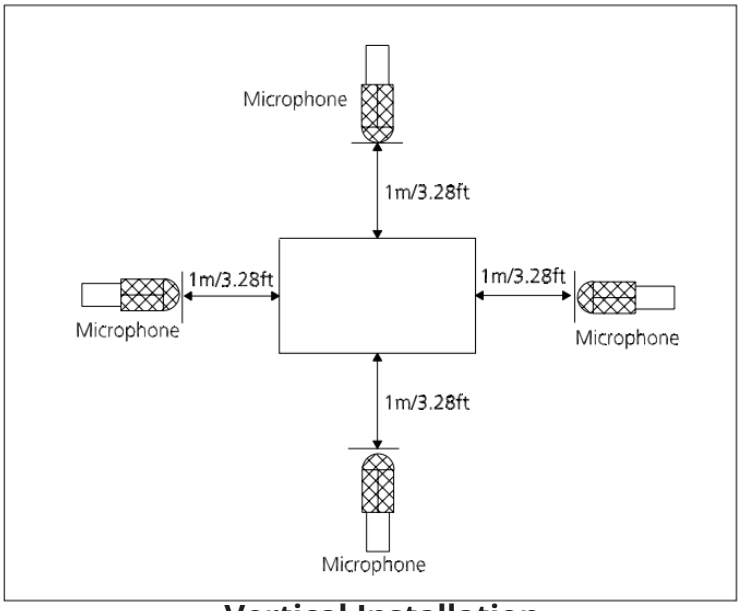
Cooling	Default	+1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Turbo	1800	1820	1840	1860	1880	1900	1920	1940	1960	1980	2000
High	1647	1667	1687	1707	1727	1747	1767	1787	1807	1827	1847
Medium	1500	1520	1540	1560	1580	1600	1620	1640	1660	1680	1700
Low	1235	1255	1275	1295	1315	1335	1355	1375	1395	1415	1435
Cooling	**Default**	**+11**	**+12**	**+13**	**+14**	**+15**	**+16**	**+17**	**+18**	**+19**	**+20**
Turbo	1800	2020	2040	2060	2080	2100	2120	2140	2153	2153	2153
High	1647	1867	1887	1907	1927	1947	1967	1987	2007	2027	2047
Medium	1500	1720	1740	1760	1780	1800	1820	1840	1860	1880	1900
Low	1235	1455	1475	1495	1515	1535	1555	1575	1595	1615	1635

Heating	Default	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
Turbo	1682	1662	1642	1622	1602	1582	1562	1542	1522	1502	1482
High	1582	1562	1542	1522	1502	1482	1462	1442	1422	1402	1382
Medium	1359	1339	1319	1299	1279	1259	1239	1219	1199	1179	1159
Low	1047	1027	1007	987	967	947	927	907	887	867	847
Heating	**Default**	**-11**	**-12**	**-13**	**-14**	**-15**	**-16**	**-17**	**-18**	**-19**	**-20**
Turbo	1682	1462	1442	1422	1402	1382	1362	1342	1322	1302	1282
High	1582	1362	1342	1322	1302	1282	1262	1242	1222	1202	1182
Medium	1359	1139	1119	1099	1079	1059	1039	1019	999	979	959
Low	1047	827	807	787	767	747	727	707	694	694	694
Heating	**Default**	**-21**	**-22**	**-23**	**-24**	**-25**	**-26**	**-27**	**-28**	**-29**	**-30**
Turbo	1682	1262	1242	1222	1202	1182	1162	1142	1122	1102	1082
High	1582	1162	1142	1122	1102	1082	1062	1042	1022	1002	982
Medium	1359	939	919	899	879	859	839	819	799	779	759
Low	1047	694	694	694	694	694	694	694	694	694	694
Heating	**Default**	**-31**	**-32**	**-33**	**-34**	**-35**	**-36**	**-37**	**-38**	**-39**	**-40~-41**
Turbo	1682	1062	1042	1022	1002	982	962	942	922	902	882
High	1582	962	942	922	902	882	862	842	822	802	782
Medium	1359	739	719	712	712	712	712	712	712	712	712
Low	1047	694	694	694	694	694	694	694	694	694	694
Heating	**Default**	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**	**+7**	**+8**	**+9**	**+10**
Turbo	1682	1702	1722	1742	1762	1782	1802	1822	1842	1862	1882
High	1582	1602	1622	1642	1662	1682	1702	1722	1742	1762	1782
Medium	1359	1379	1399	1419	1439	1459	1479	1499	1519	1539	1559
Low	1047	1067	1087	1107	1127	1147	1167	1187	1207	1227	1247
Heating	**Default**	**+11**	**+12**	**+13**	**+14**	**+15**	**+16**	**+17**	**+18**	**+19**	**+20**
Turbo	1682	1902	1922	1942	1962	1982	2002	2022	2042	2062	2082
High	1582	1802	1822	1842	1862	1882	1902	1922	1942	1962	1982
Medium	1359	1579	1599	1619	1639	1659	1679	1699	1719	1739	1759
Low	1047	1267	1287	1307	1327	1347	1367	1387	1407	1427	1447

2.6 Noise Criterion Curves



Horizontal Installation

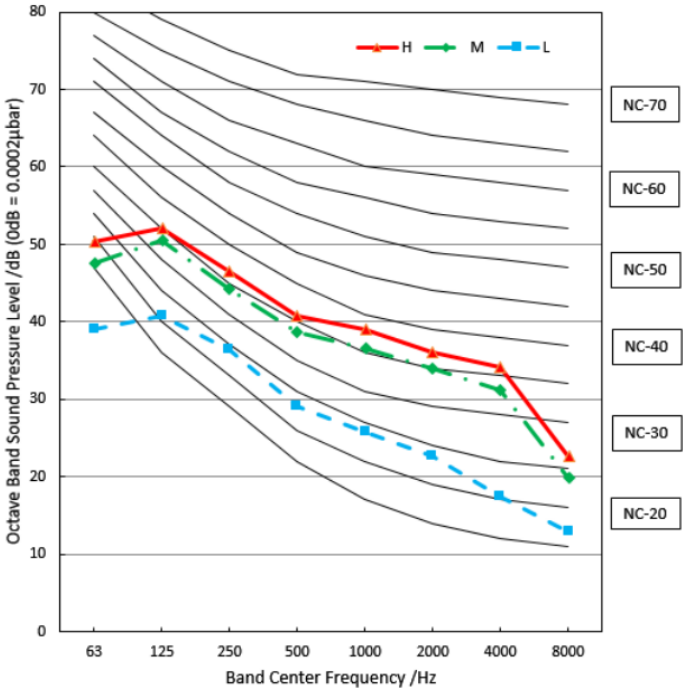


Vertical Installation (H=0.5x (height of unit+1))

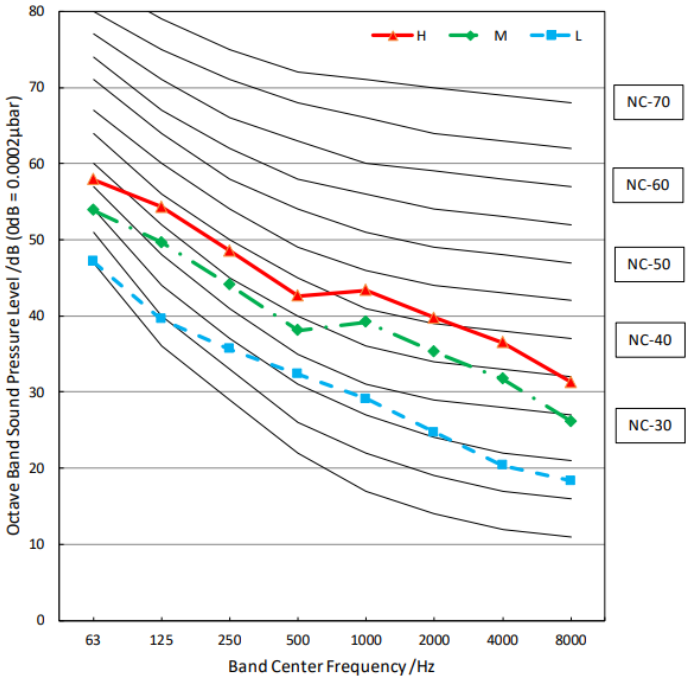
Notes:

- Sound is measures at 4.92ft/1.5m (horizontal installation) /3.28ft/1m (vertical installation) away from the center of the unit.
- Data is valid at free field condition.
- Reference acoustic pressure OdB=20μPa
- Sound level will vary depending on a range of factors such as the construction (acoustic absorption coefficient) of the room in which the equipment is installed.
- The operating conditions are assumed to be standard.

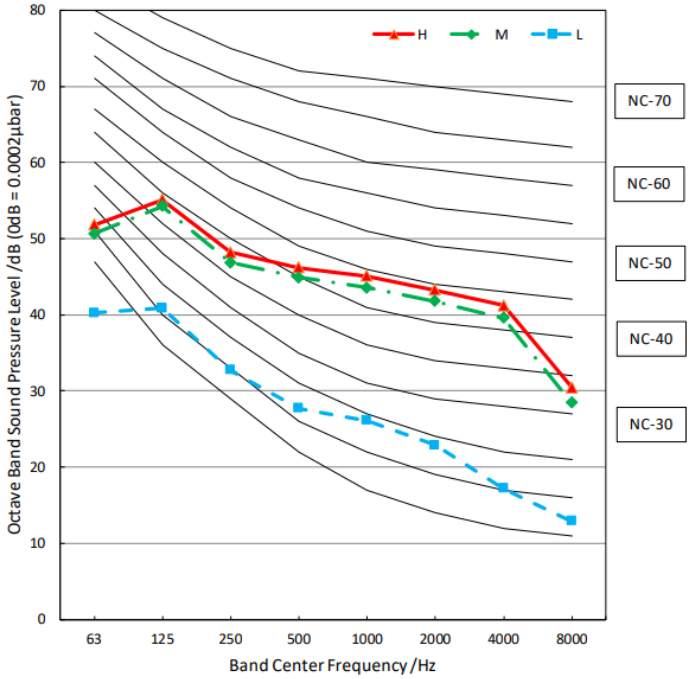
24k


H
M
L
NC-70
NC-60
NC-50
NC-40
NC-30
NC-20
Octave Band Sound Pressure Level /dB (0dB = 0.0002μbar)
Band Center Frequency /Hz
0
10
20
30
40
50
60
70
80
63
125
250
500
1000
2000
4000
8000

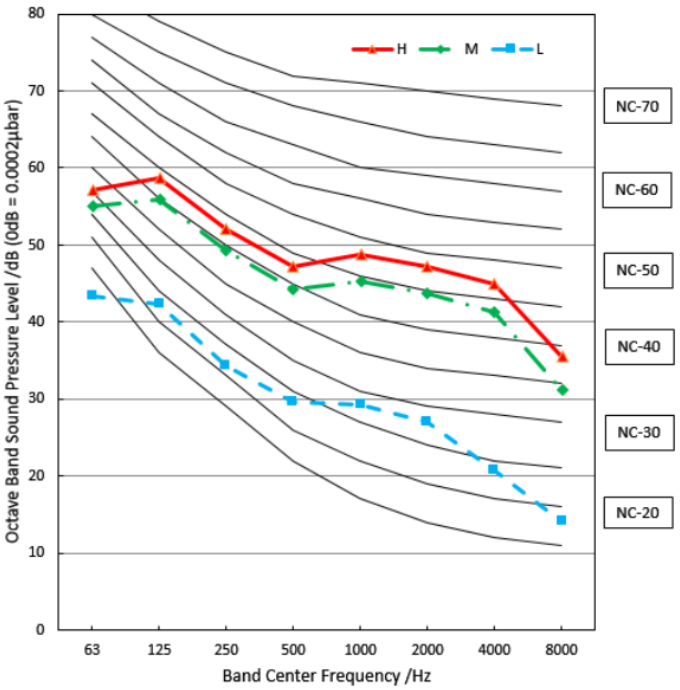
30k


H
M
L
NC-70
NC-60
NC-50
NC-40
NC-30
Octave Band Sound Pressure Level /dB (0dB = 0.0002μbar)
Band Center Frequency /Hz
0
10
20
30
40
50
60
70
80
63
125
250
500
1000
2000
4000
8000

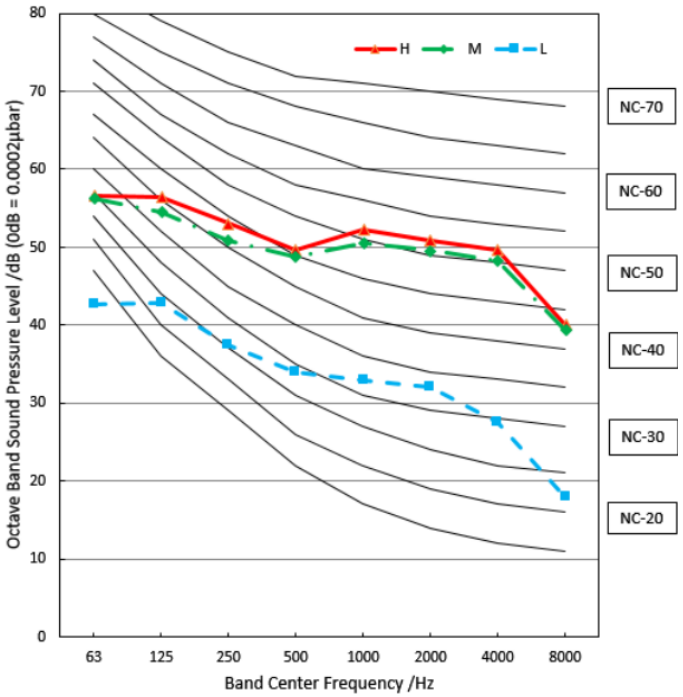
36k


H
M
L
NC-70
NC-60
NC-50
NC-40
NC-30
Octave Band Sound Pressure Level /dB (0dB = 0.0002μbar)
Band Center Frequency /Hz
0
10
20
30
40
50
60
70
80
63
125
250
500
1000
2000
4000
8000

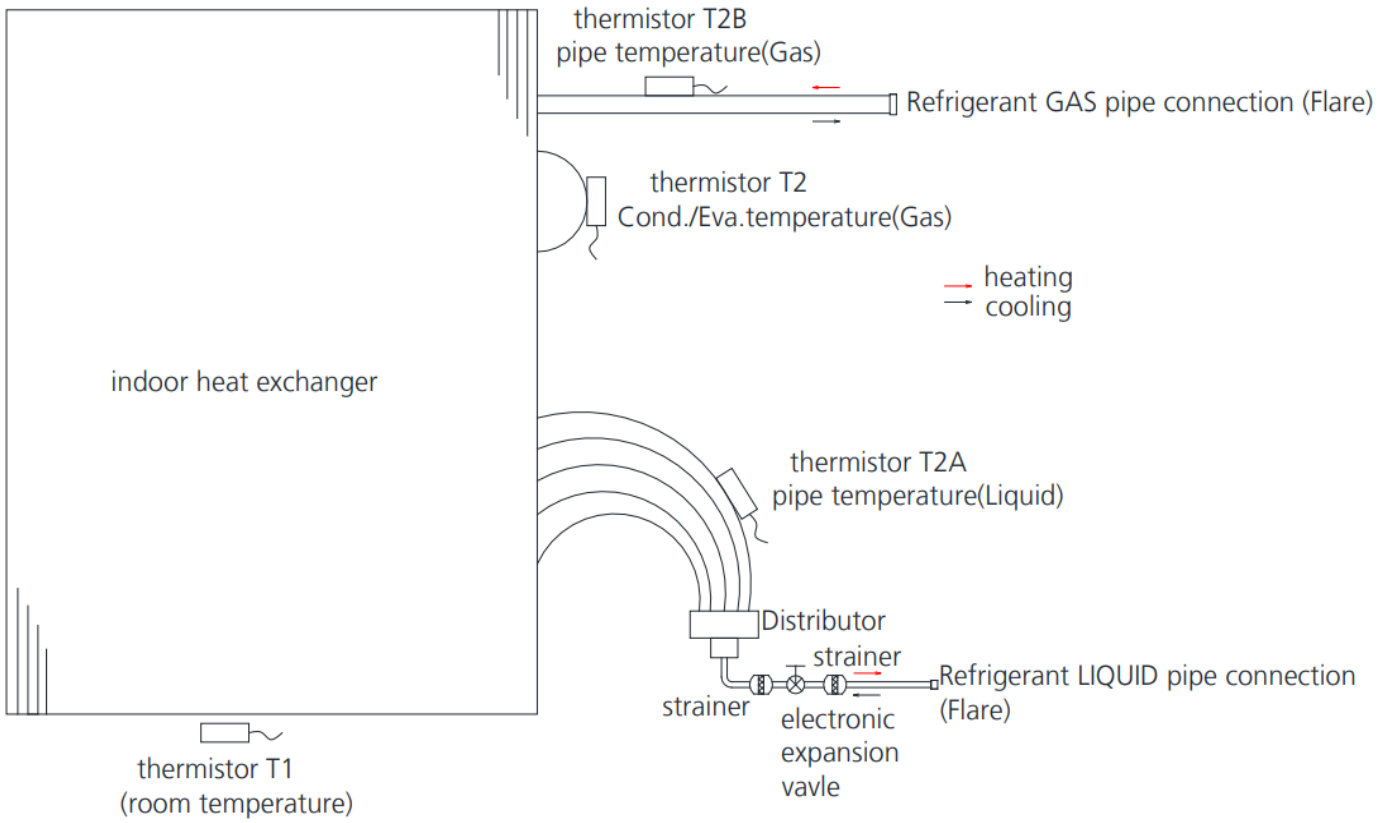
48k



60k



2.7 Refrigerant System Diagram



2.8 Electrical Wiring Diagrams

Electrical Characteristics:

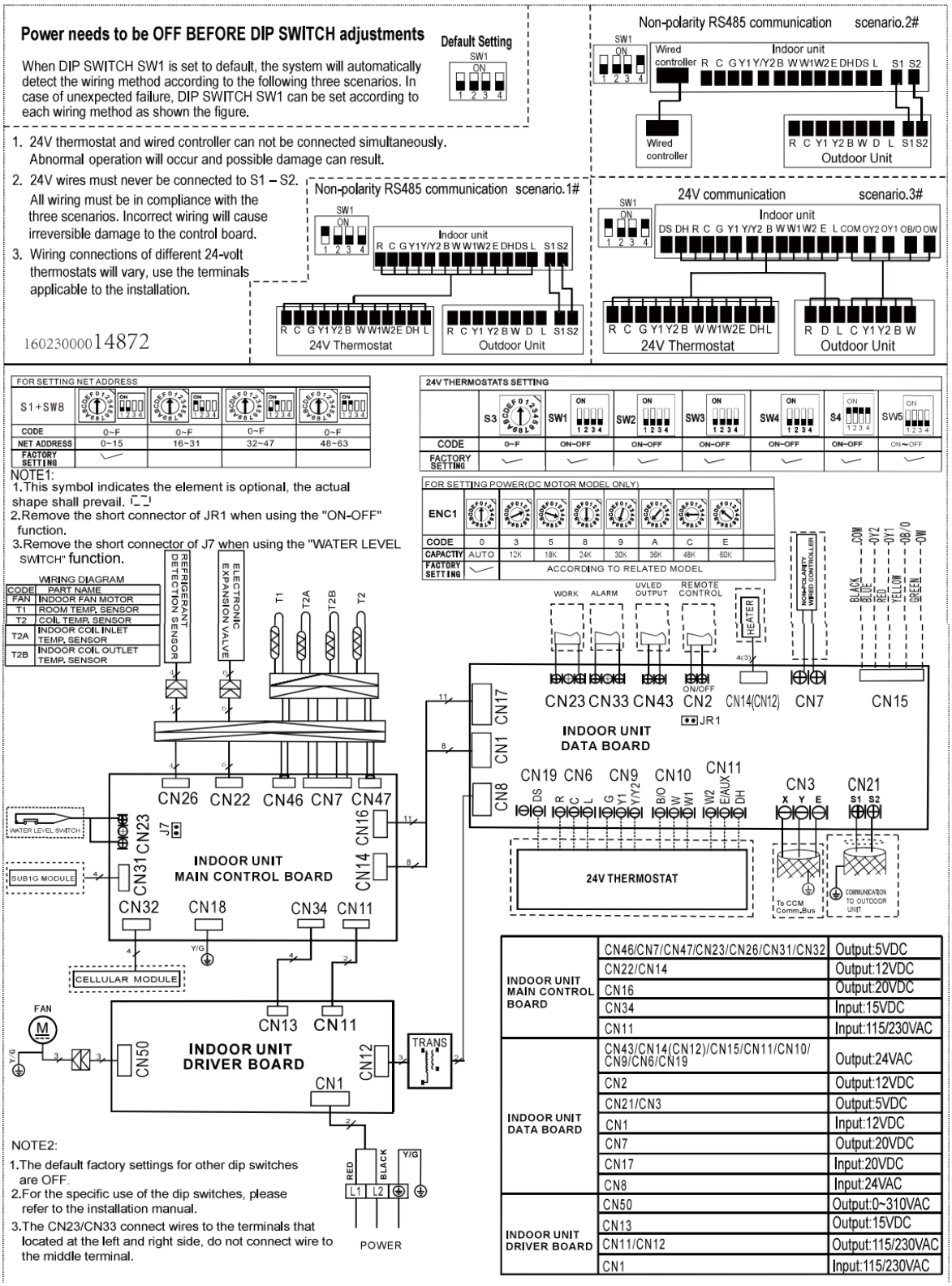
IDU Model			24K	30K	36K	48K	60K
Power	Phase		1				
	Frequency and Volt		115/208/230V,60Hz				
MCA (Minimum Circuit Ampacity)	115V	A	8.0	10.0	10.0	17.5	17.5
	208/230V	A	5.5	6.0	6.0	11.0	11.0
MOP (Rating of Overcurrent Protective Device)	115V	A	15.0	15.0	15.0	20.0	20.0
	208/230V	A				15.0	15.0

Electrical Wiring Diagrams:

Capacity (Btu/h)	IDU Wiring Diagram
24K	16023000014872
30K	
36K	
48K	
60K	

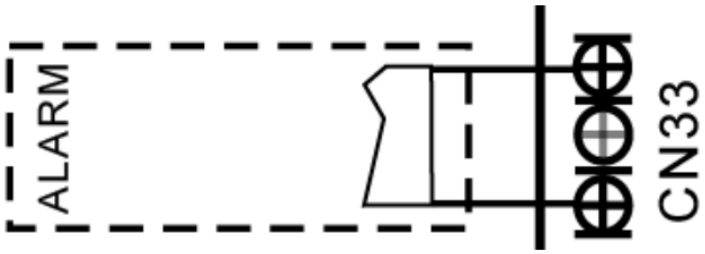
Abbreviation	Paraphrase
Y/G	Yellow-Green Conductor
FAN1	Indoor ECM Motor
To CCM Comm.Bus	Central Controller
T1	Indoor Room Temperature Sensor
T2	Indoor Coil Temperature Sensor
T2A	Indoor Coil Inlet Temperature Sensor
T2B	Indoor Coil Outlet Temperature Sensor

Indoor Unit Wiring Diagram: 16023000014872



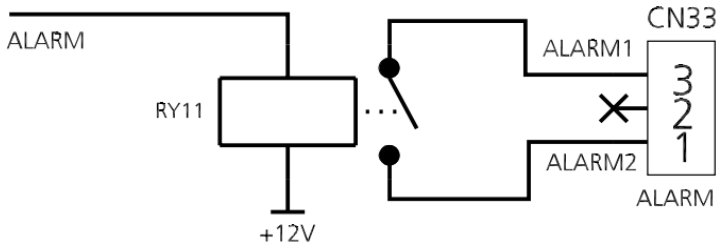
INDOOR UNIT MAIN CONTROL BOARD	CN46/CN7/CN47/CN23/CN26/CN31/CN32	Output:5VDC
	CN22/CN14	Output:12VDC
	CN16	Output:20VDC
	CN34	Input:15VDC
	CN11	Input:115/230VAC
INDOOR UNIT DATA BOARD	CN43/CN14(CN12)/CN15/CN11/CN10/ CN9/CN6/CN19	Output:24VAC
	CN2	Output:12VDC
	CN21/CN3	Output:5VDC
	CN1	Input:12VDC
	CN7	Output:20VDC
	CN17	Input:20VDC
	CN8	Input:24VAC
INDOOR UNIT DRIVER BOARD	CN50	Output:0~310VAC
	CN13	Output:15VDC
	CN11/CN12	Output:115/230VAC
	CN1	Input:115/230VAC

Micro-Switches:

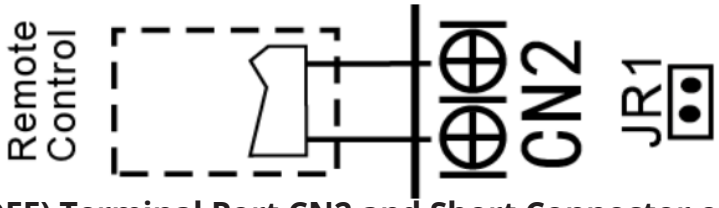


For ALARM Terminal Port CN33:

1. Use the terminal port to connect ALARM. (The terminal does not send power and must be supplied separately).
2. Design voltage can support higher voltage but it is highly recommended to use less than 24v with a current of less than 0.5A.
3. When a issue occurs the relay will close and the ALARM stops the system.

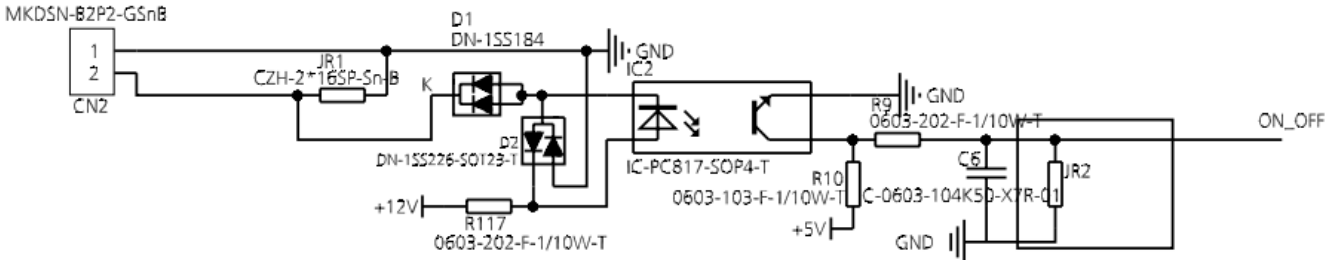


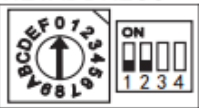
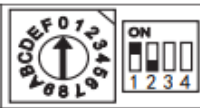
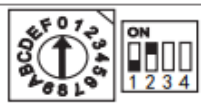
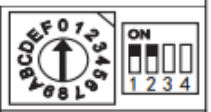
JDQ-SS-112V/5A-O-T85-P35-B-02



For Remote Control (ON-OFF) Terminal Port CN2 and Short Connector of JR1:

1. Remove the short connector of JR1 when you use ON-OFF function.
2. When the remote switch is off (OPEN); the unit will be off.
3. When the remote switch in on (CLOSE); the unit will be on.
4. When the switch is triggered the unit will respond to the demand within 2 seconds.
5. When the remote switch is on, you can use the remote controller/wired controller to select the mode desired, when the remote switch is off the unit will not respond to a demand from the remote/wire controller.
6. The voltage of the power is 12VDC with a design max. current of 5mA.



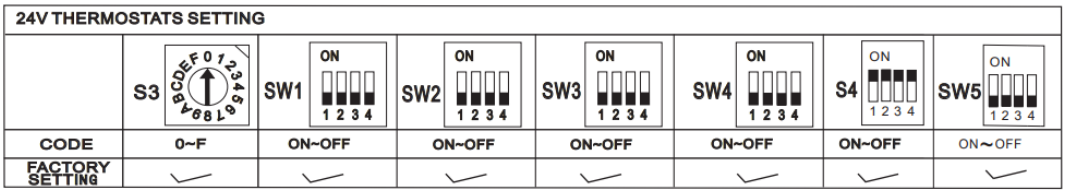
FOR SETTING NETADDRESS				
S1+SW8				
CODE	0~F	0~F	0~F	0~F
NETADDRESS	0~15	16~31	32~47	48~63
FACTORY SETTING	✓			

Micro-switch S1 and dial-switch SW8 are for address settings when you want to control this unit by a central controller.
Range: 00-63
Network address: the address silkscreen is NET address, which is composed of a 16-bit address rotary code S1 plus a two-digit DIP switch SW8 {Set during engineering installation, no network function needs to be set].
When SW8 is 00 (The dialing code is not connected), the network address value is the value of S1.
When SW8 is 10 (Corresponding to the switch of the hardware connected to the 10K resistor), the network address value is S1 plus 16.
Determined by dial code SW8 1-10K, 2-5.1K.
When SW8 is 01 (Corresponding to the dial code of the 5.1K resistor connected to the hardware is turned on), the network address value is the value of S1 plus 32.
When SW8 is 11 (All dialing codes are on), the network address value is the value of S1 plus 48.

Dial Code Selection	Net Address
	S1+48
	S1+32
	S1+16
	S1

FOR SETTING POWER(DC MOTOR MODEL ONLY)									
ENC1									
CODE	0	3	5	8	9	A	C	E	
CAPACTIY	AUTO	12K	18K	24K	30K	36K	48K	60K	
FACTORY SETTING	✓	ACCORDING TO RELATED MODEL							

Dial-Switch ENC1: The indoor PCB is universally designed for whole series units from 12K to 60K. This ENC1 setting will tell the main program what size the unit is.
Range: AUTO, 12K, 18K, ...60K.
Note: AUTO means the indoor unit is equipped with different outdoor units, which can automatically identify the capacity of the outdoor unit either single or multi zone and match the indoor units parameters.



Function DIP Switch Settings:
The 24V Thermostat Mode Needs to Refer to the Following Steps:

No.	Dial Code	Function	ON	OFF(Default)	Note
Control Scenario		**24V Tstat, S1+S2**			
1	SW1-2	Anti-cold blow protection option	No	[Default] Yes	
2	SW1-3	Single cooling/ heating and cooling options	Cooling	[Default] Cooling & Heating	
3	SW2-1	Compressor Running (demand working with heat pump+electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W1
4	SW2-4	Compressor	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited. The system makes judgments according to the following rules: 1. The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature =2°C. 2. The compressor cannot be operated when the outdoor temperature is lower than S3 DIP switch temperature.	[Default] The operation of the heat pump is limited by the outdoor temperature and the operation of auxiliary heat is not limited. The system makes judgments based on the following rules: 1. The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch. 2. The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2°C.	SW2-4 and S3 need to be working together
5	Rotary Switch S3	Sets the outdoor temperature limitation (for auxiliary heating or compressor)	Table A		
6	SW3-1	Maximum continuous runtime allowed before the system automatically stages up capacity to satisfy set point. This adds 1-5°F to the user set point in the calculated control point to increase capacity and satisfy user set point.	30 Minutes	[Default] 90 minutes	

No.	Dial Code	Function	ON	OFF(Default)	Note
Control Scenario		24V Tstat, S1+S2			
7	SW3-2	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor
8	SW3-3	Compressor running (demand working with heat pump+electric heat)	Compressor slower speed	[Default] Faster Compressor	Only affects compressor and W2
9	SW3-4	Fan speed of cooling mode when 24V thermostat is applied for	Turbo	High	
10	SW4-1 SW4-2 SW4-3	Electric heat nominal CFM adjustment	Available settings are 000/001/010/011. Each digit corresponds to an individual switch position. For example [SW4-1 OFF, SW4-2 ON, SW4-3 OFF]=010		
11	S4-4	Default ON	[Default] For single stage supplemental heat, W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently	
12	S4-2	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	
13	SW5-3	L or Alarm relay selection	L output 24V or alarm relay close only when refrigerant sensor fault or R454B refrigerant leakage is detected	[Default] L output 24V or alarm relay close when any fault is detected	
14	SW5-4	R output selection	R stop output 24v When refrigerant sensor fault or R454B refrigerant leakage is detected	[Default] R keep output 24V even when refrigerant sensor fault or R454B refrigerant leakage is detected	

No.	Dial Code	Function	ON	OFF(Default)	Note
Control Scenario		Wired Controller			
1	SW1-2	Anti-cold blow protection option	No	[Default] Yes	
2	SW1-3	Single cooling/ heating and cooling options	Cooling	[Default] Cooling & Heating	
3	SW2-1	Temperature differential to activate first stage auxiliary heat (the GAP of T1 and Ts), Wire controller demand with heat pump+electric heat working together	26°F (1°C)	[Default] 4°F (2°C)	
4	SW2-2	Electric heat on delay	Yes	[Default] No	
5	SW2-3	Electric auxiliary heating delay to start time	30 minutes	[Default] No	
6	SW2-4	Compressor	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited. The system makes judgments according to the following rules: 1. The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +2°C. 2. The compressor cannot be operated when the outdoor temperature is lower than S3 DIP switch temperature.	[Default] Only one heat pump or auxiliary heat can be operated. The system makes judgments according to the following rules: 1. When the outdoor temperature is lower than the S3 DIP switch temperature, the compressor is not allowed to be operated but auxiliary heat is allowed. 2. When the outdoor temperature is ≥S3 DIP switch temperature +2°C the compressor can be operated but auxiliary heat cannot be operated.	SW2-4 and S3 need to be working together
7	Rotary Switch S3	Sets the outdoor temperature limitation (for auxiliary heating or compressor)	Table A		
8	SW3-3	Temperature differential to activate second stage auxiliary heating (the GAP of T1 and Ts) Wire controller demand with heat pump+electric heat working together	4°F (2°C)	[Default] 6°F (3°C)	

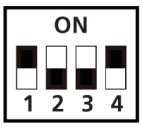
No.	Dial Code	Function	ON	OFF(Default)	Note
Control Scenario		**Wired Controller**			
9	SW4-1 SW4-2 SW4-3	Electric heat nominal CFM adjustment	Available settings are 000/001/010/011. Each digit corresponds to an individual switch position. For example [SW4-1 OFF, SW4-2 ON, SW4-3 OFF]=010		
10	SW4-4	Temperature differential to activate third stage auxiliary heating (the GAP of T1 and Ts) Wire controller demand with heat pump+electric heat working together	6°F (3°C)	[Default] 8°F (4°C)	Only valid for product which has three stage auxiliary heating
11	SW5-3	L or Alarm relay selection	L output 24V or alarm relay close only when refrigerant sensor fault or R454B refrigerant leakage is detected	[Default] R keep output 24v even when refrigerant sensor fault or R454B refrigerant leakage is detected	
12	SW5-4	R output selection	R stop output when refrigerant sensor fault or R454B refrigerant leakage is detected	[Default] R keep output 24v even when refrigerant sensor fault or R454B refrigerant leakage is detected	
Control Scenario		**Full 24V**			
1	SW1-2	Anti-cold blow protection option	No	[Default] Yes	
2	SW1-3	Single cooling/ heating and cooling options	Cooling	[Default] Cooling & Heating	
3	SW3-4	Fan speed of cooling mode when 24V thermostat is applied for	Turbo	High	
4	SW4-1 SW4-2 SW4-3	Electric heat nominal CFM adjustment	Available settings are 000/001/010/011. Each digit corresponds to an individual switch position. For example [SW4-1 OFF, SW4-2 ON, SW4-3 OFF]=010		
5	S4-4	Default ON	[Default] For single stage supplemental heat, W1 and W2 are connected	For dual stage supplemental heat, W1 and W2 are controlled independently.	
6	S4-2	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through thermostat	
7	SW5-3	L or Alarm relay selection	L output 24V or alarm relay close only when refrigerant sensor fault or R454B refrigerant leakage is detected	[Default] L output 24V or alarm relay close when any fault is detected	
8	SW5-4	R output selection	R stop output 24V when refrigerant sensor fault or R454B refrigerant leakage is detected	[Default] R keep output 24V even when refrigerant sensor fault or R454B refrigerant leakage is detected	

Table A:

S3	S3 (°F)	S3 (°C)	S3	S3 (°F)	S3 (°C)
0	OFF	OFF	8	10	-12
1	-22	-30	9	18	-8
2	-18	-28	A	25	-4
3	-15	-26	B	32	0
4	-11	-24	C	36	2
5	-8	-22	D	39	4
6	-4	-20	E	43	6
7	3	-16	F	46	8

SW4-1	000 is default
SW4-2	000/001/010/011/100/101/110/111 , Internal machines with different abilities, electric heating and PSC classification for use
SW4-3	

Function Combination Table of SW1-1 and SW1-4:

SW1	Control Type	IDU and ODU Connection	Note
	Wired Controller / 24V Thermostat	(S1+S2) / 24V Connection	Auto Discovery
	Wired Controller	S1+S2	Scenario 2
	24V Thermostat	S1+S2	Scenario 1
	24V Thermostat	24V Thermostat	Scenario 3

3.1 Location

DO NOT install the unit in the following locations:

- DO NOT install the indoor unit in a moist environment. Excessive moisture can corrode the equipment, electrical components, and cause electrical shorts.
- Areas with strong electromagnetic waves.
- Coastal areas with high salt content in the air.
- Areas with oil drilling or fracking.
- Areas that store flammable materials or gas.
- Areas where there may be detergent or other corrosive gases in the air such as bathroom or laundry rooms.
- Areas where the air inlet and outlet may be obstructed.
- Areas with flammable materials and vapors.

The unit must be installed in a location that meets the following requirements:

☑ Securely install the indoor unit on a structure that can support its weight. If the structure is too weak, the unit may fall and cause personal injury, unit and property damage, or death.

☑ Enough room for installation and maintenance.

☑ Enough room for the connecting pipe and drainpipe.

☑ Place air handler so that heating elements are at least 18in(460mm) above the floor for a garage installation. Failure to follow these instructions can result in death, explosion, or fire.

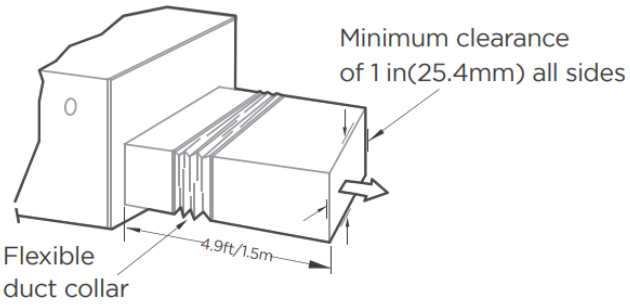
☑ The structure that the equipment is suspended from must support the weight of the indoor unit.

3.2 Indoor Unit Installation

Service Space for the Indoor Unit:

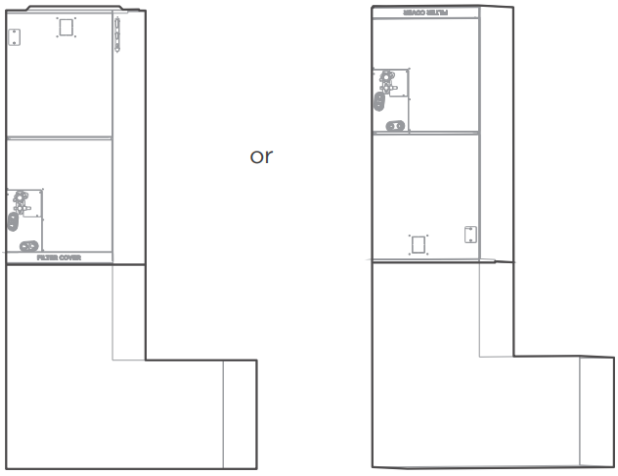
Horizontal Installation:

Plenum Clearances:



The outlet side pipe length 4.9ft/1.5m.

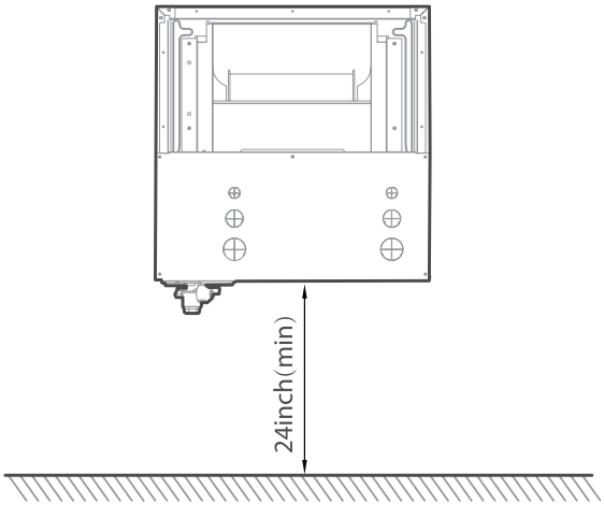
Vertical Installation:



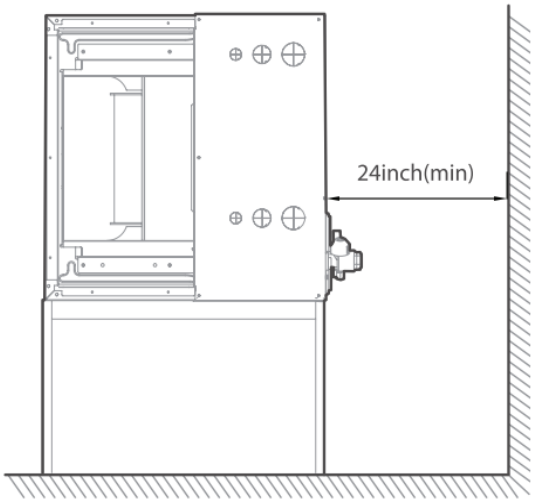
When installed vertical (upflow or downflow) the lower end of the air outlet needs to be connected to the L-Shaped air duct and fastened by screws.

Spacing:

Vertical Installation:



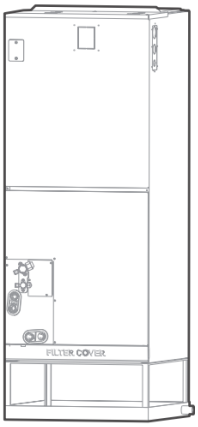
Horizontal Installation:



Installation of the Main Body:

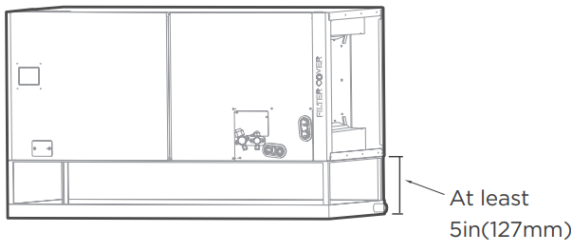
The units can be installed in a vertical (downflow and upflow) and horizontal (right or left) configuration.

Vertical Installation:



Vertical up

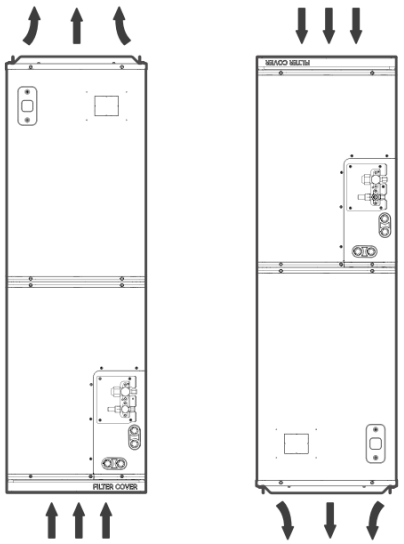
Horizontal Installation:



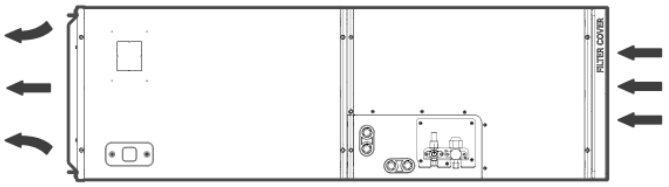
Horizontal

Note:

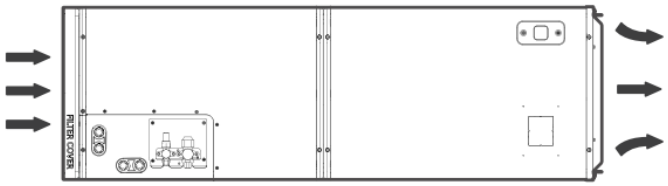
- *For horizontal installation, a secondary drain pan (not supplied) must be installed.*
- *In horizontal installs the air handler requires a 5° tilt on the drain pipe side.*



Up flow Down flow



Left flow

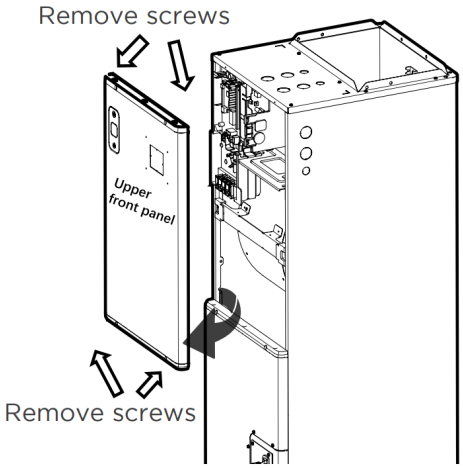


Note: Vertical up and horizontal left installations do not need the evaporator coil positioned changed.

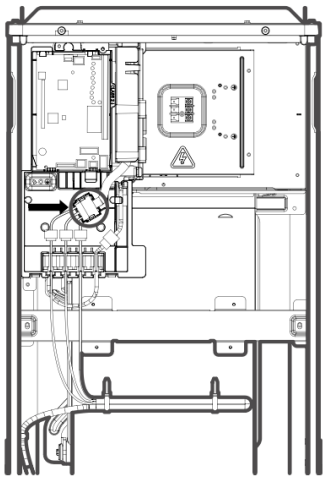
3.3 Downflow & Horizontal Left Install

Follow the following steps to perform vertical down and horizontal left installations:

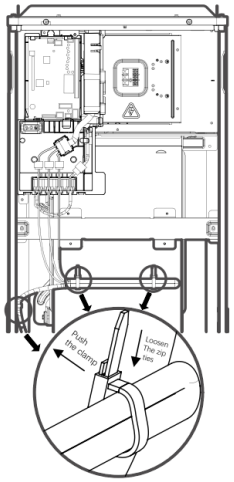
1. Remove the four screws and open the upper front panel.



2. Disconnect the connector.

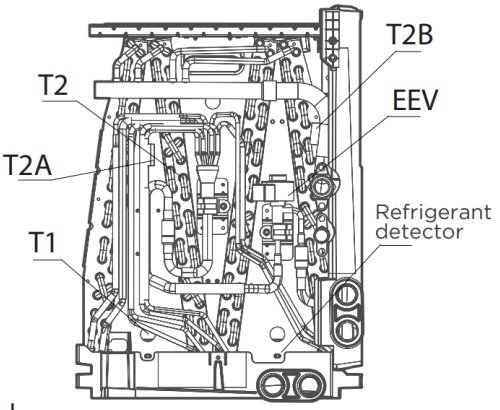


3. Loosen three zip ties (reusable zip ties).

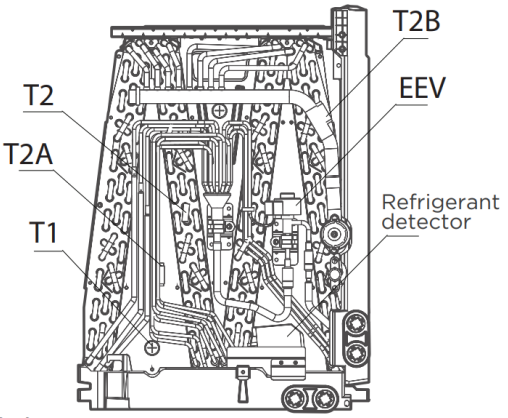


4. Indication of the position of each temperature sensor of the evaporator coil, confirm your model below.

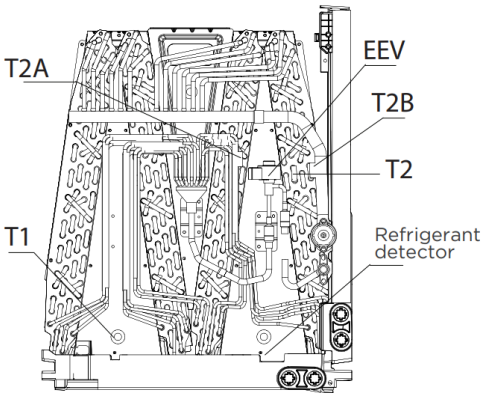
24K model



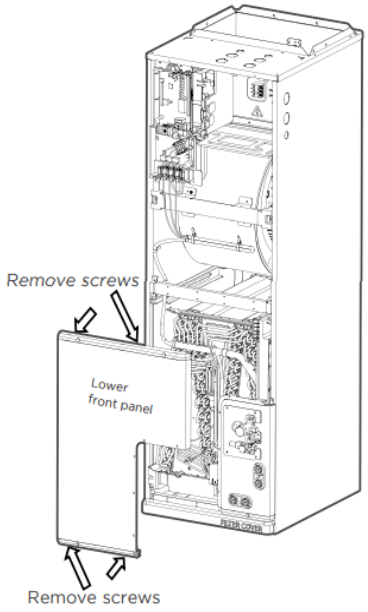
30-36K model



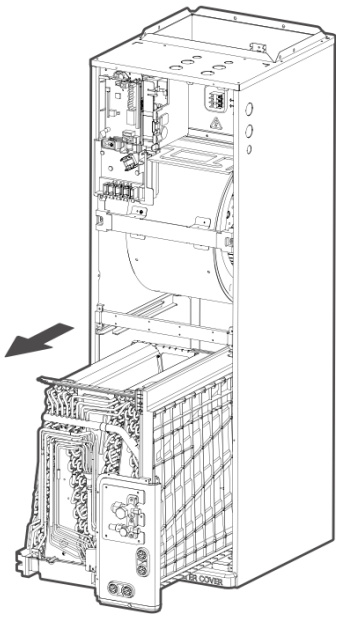
48-60K model



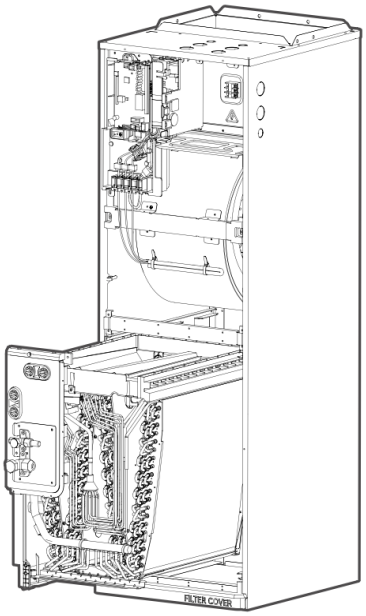
5. Remove the four screws and open the lower front panel.



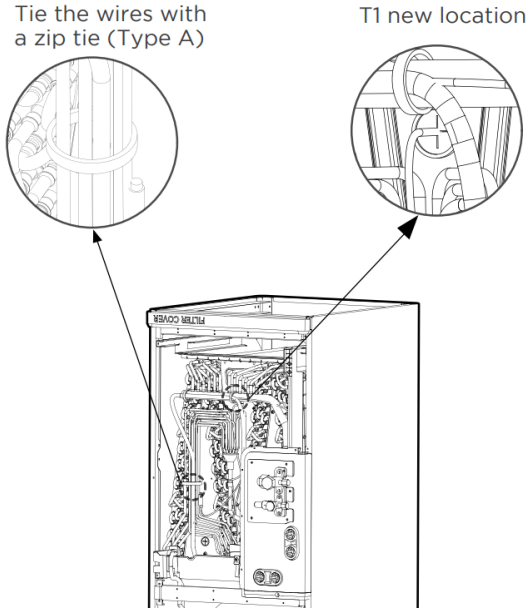
6. Take out the evaporator, drain pan and rotate 180° (when your equipment needs to be vertical down configuration).

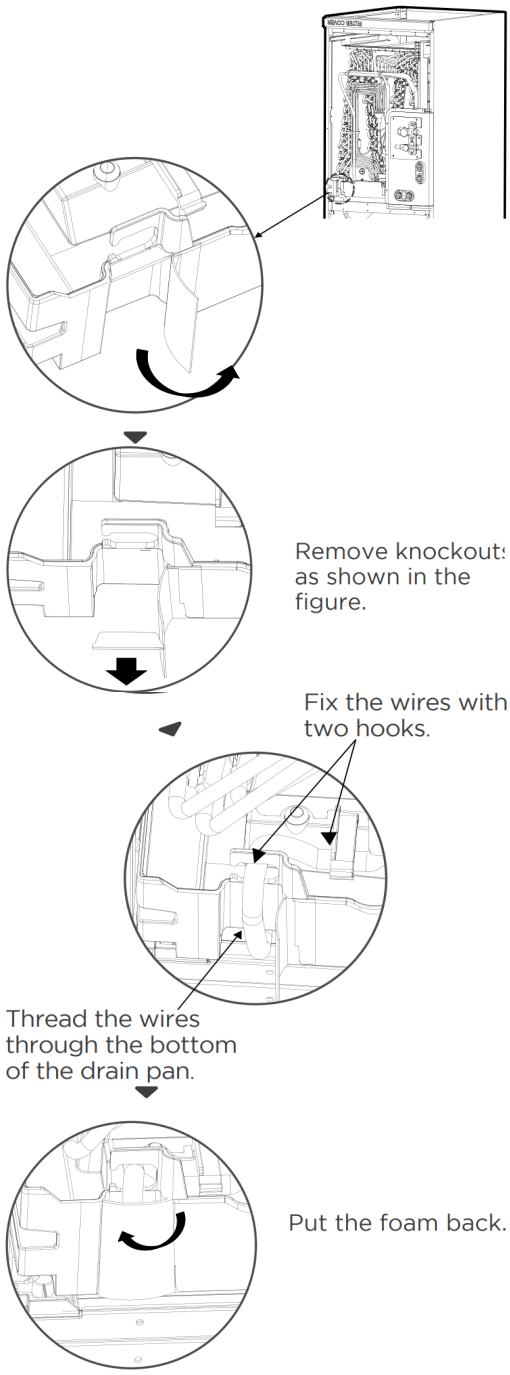


7. Reinstall the evaporator and drain pan.



8. Relocate the wires in the coil module.

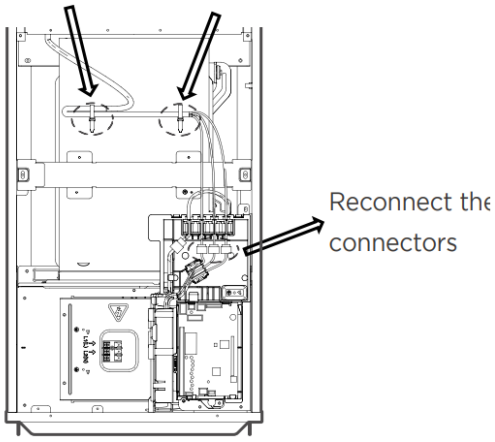




Note: The wire body needs to pass through the wire groove from the drain pan and be stuck on the hook of the drain pan.

9. Relocate the wires in the fan module.

Fix the wires with the zip ties of fan housing.



10. Connect the wire according to the wiring diagram.

11. Reassemble the upper and lower front panel.

! CAUTION

- Insulate all piping to prevent condensation, which could lead to water damage.
- The drainpipe is used to drain water away from the unit. If the drainpipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction.
- In HEAT mode, the outdoor unit will discharge water. Ensure that the drain hose is placed in an appropriate area to avoid water damage and icy conditions on walkways.
- DO NOT pull the drainpipe forcefully. This could disconnect it.

Note: If installed above a finished living space, a secondary drain pan (as required by many building codes), must be installed under the entire unit and its condensate drain line must be routed to a location such that the user will see the condensate discharge.

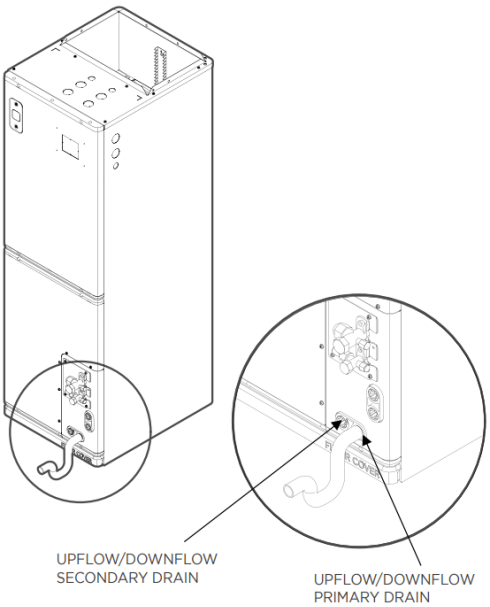
Note on purchasing pipes: Installation requires pvc pipe or other suitable material per local and national codes, which can be obtained at your local hardware store or dealer.

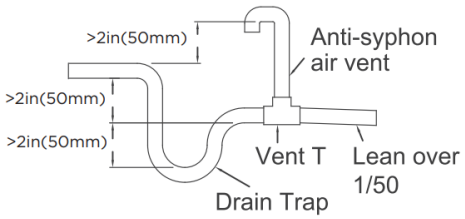
Warning

- After removal of the drain pan plugs, check the drain holes to verify that the drain opening is fully open and free of any debris. Also check to make sure that there no debris have fallen into the drain pan during installation that may plug up the drain opening. Seal around the exiting drain pipe, liquid, and suction lines to prevent infiltration of humid air.
- On units of this type, where the blower "draws" rather than "blows" air through the coil, traps must be installed in the condensate drain lines (primary and auxiliary, if used). Traps prevent the blower from drawing air through the drain lines into the air supply.

3.4 Vertical Installation

- These units operate with a negative pressure at the drain connections and a drain trap is required. The trap needs to be installed as close to the unit as possible. Make sure that the top of the trap is below the connection to the drain pan to allow complete drainage of the pan.





Note: Horizontal runs must also have an anti-siphon air vent (standpipe) install ahead of the horizontal run to eliminate air trapping.
Note on drain pipe installation:

- *The figure shows how to trap or plug all drains during vertical discharge.*
- *The figure shows how to trap or plug all drains during right-hand discharge.*
- *The seal plugs are supplied as accessories and should be screwed tightly only by hand.*
- *Incorrect installation could cause water to flow back into the unit and flood.*

CAUTION

The drainpipe outlet should be at least 2in (5cm) above the ground. If it touches the ground, the unit may become blocked and malfunction.

2.4 Refrigerant Pipe Installation

Recommended Copper Pipe Thickness:

Pipe Diameter (inch(mm))	Thickness (inch/mm)
Ø3/8 (Ø9.52)	0.028/0.7
Ø3/4 (Ø19)	0.031/0.8

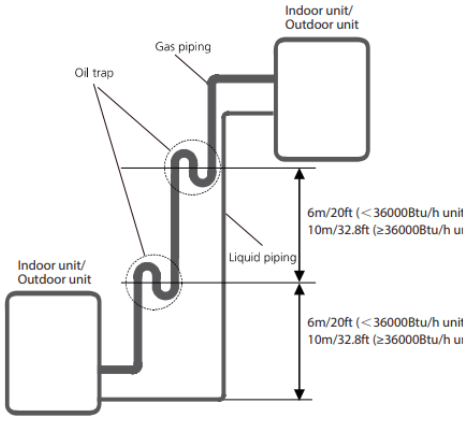
Maximum Length and Drop Height:

Ensure that the length of the refrigerant pipe, the number of bends, and the drop height between the indoor and outdoor units meet the requirements shown in the following table.

Capacity (kBtu/h)	Max. Length (ft/m)	Max. Elevation (ft/m)
24~30	164/50	82/25
36~60	246/75	98.4/30

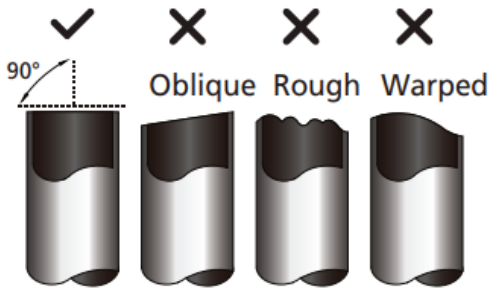
CAUTION

1. The capacity test is based on the standard length and maximum permissive length is based on the system reliability.
2. Oil traps.
   - If oil flows back into the outdoor unit's compressor, this might cause liquid compression or deterioration of oil return. Oil traps in the rising gas piping can prevent this.
   - An oil trap should be installed every 20ft (6m) of vertical suction line riser (<36kBtu/h unit).
   - An oil trap should be installed every 32.8ft (10m) of vertical suction line riser (≥36kBtu/h unit).

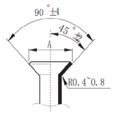


Procedure of Connecting Pipes:

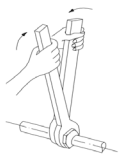
1. Choose the pipe size according to the specification table.
2. Confirm the cross way of the pipes.
3. Measure the necessary pipe length.
4. Cut the selected pipe with a pipe cutter.
   - Make the section flat and smooth.



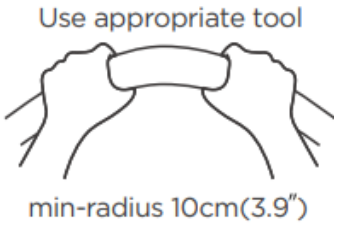
5. Insulate the copper pipe.
   - Before test operation the joint parts should not be heat insulated.
6. Flare the pipe
   - Insert a flare nut into the pipe before flaring the pipe.
   - According to the following table to flare the pipe.

Pipe Diameter (inch(mm))	Flare dimension A (inch/mm)		Flare Shape
	Min	Max	
Ø3/8 (Ø9.52)	0.52/13.2	0.53/13.5	
Ø3/4 (Ø19)	0.91/23.2	0.93/23.7	

   - After flaring the pipe the opening part must be sealed by the end cover with adhesive tape to avoid introducing impurities into the pipe.
7. Drill holes if the pipes need to pass through a wall.
8. According to the field condition you may have to bend piping accordingly to pass through the wall smoothly.
9. Bind and wrap the wire together with the insulated pipe if necessary.
10. Set the wall conduit.
11. Locate the pipe and fix it by the supporter.
    - For horizontal refrigerant pipe, the distance between the supports should not exceed 3.3ft (1m).
    - For vertical refrigerant pipe the distance between supporters should not exceed 4.9ft (1.5m).
12. Connect the pipe to the indoor unit and outdoor unit by using two crescent wrenches.
    - Be sure to use two crescent wrenches and proper torque to fasten the nut, too much torque will damage the bell mouthing and too little of torque can cause a leak. Refer to the following table for different pipe connections.

Pipe Diameter (inch(mm))	Torque	Sketch Map
	N.m. (lb. ft.)	
Ø3/8 (Ø9.52)	32~39 (23.6~28.8)	
Ø3/4 (Ø19)	67~101 (49.4~74.5)	

Note: Minimum bend radius
Carefully bend the tubing in the middle according to the diagram below.
DO NOT bend the tubing more than 90° or more 3 times.



3.5 Piping Insulation

Insulation of Refrigerant Pipe:

1. **Operational Procedure of Refrigerant Pipe Insulation:**

Cut the suitable pipe > insulation (except joint section) > flare the piping > piping layout and connection > vacuum drying > insulate joints.

2. **Purpose of Refrigerant Pipe Insulation:**

- During operation the temperature of the gas pipe and liquid pipe will be very hot/cold. Therefore insulation is necessary as without it will decrease performance and can cause the compressor to burnout.
- The gas pipe temperature is low during cooling operation, if lacking insulation it will condensate.
- The gas pipe temperature is high (generally 122°F-212°F (50°C-100°C)) in heating operating. If lacking insulation it can result in burns.

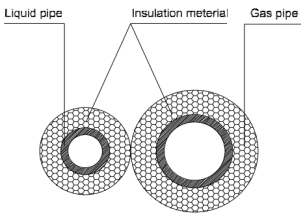
3. **Insulation Material Selection for Refrigerant Pipes:**

- Insulation should withstand 248°F (120°C)
- Choose insulation materials according to local codes.

Humidity<80%RH	Humidity≥80%Rh
10mm/0.39in.	15mm/0.59in.

4. **Highlights of Insulation Construction:**

- The gas pipe and liquid pipe needs to be insulated separately. (If the gas and liquid pipe were insulated together it will decrease the performance of the system).



- The insulation material at jointing pipes shall be 1.96in (5cm)~3.93in (10cm) longer than the gap of the insulation material.
- Insulation material at the joint needs to be inserted into the gap of the insulation material.
- Insulation material at the joint needs to be banded to the gap and liquid pipe tightly.
- The linking part should by glued together.
- Make sure not to bind the insulation material tightly, it can extrude air out of the material causing it to age faster.

Insulation of drain line:

1. **Operational Procedure of Refrigerant Pipe Insulation:**

Cut the suitable pipe > insulation (except joint section) > Piping layout and connection > drainage test > insulate joints.

2. **Purpose of Drainage Pipe Insulation:**

The temperature of the condensate drainage water is low. If there is insufficient insulation it will sweat and leak causing damage to structures.

3. **Insulation Material Selection for Drainage Pipe:**

- The insulation material should be flame retardant material and the flame retardant of the material should be selected according to the local codes.
- Thickness of the insulation is usually above 0.39in (10mm).
- Use specific glue to paste the seam of insulation material and then bind with adhesive tape. The width of the tape shall be no less than 1.97in (5cm). Make sure it is firm to avoid sweating.

4. **Installation and Highlight of Insulation Construction:**

- A single piece of pipe should be insulated before connecting to another pipe, the joint should be insulated after the drainage test.
- There should be no insulation gap between the insulation material.

3.6 Auxiliary Heat

Note:
Installation must be performed by a licensed contractor. Please make necessary precaution when performing the installation operation.

Preparations for Installation:
Before installation, please confirm the electric auxiliary heat module and supplied accessories are complete and free of any damage. Do not attempt to install if there is damage present.

Accessories:

Name	Quantity
Manual	2
Foam Gasket	1
Screws	7
Silicone Breaker Cover	1
Electric Auxiliary Heating Diagram	1
Circuit Breaker Label	1

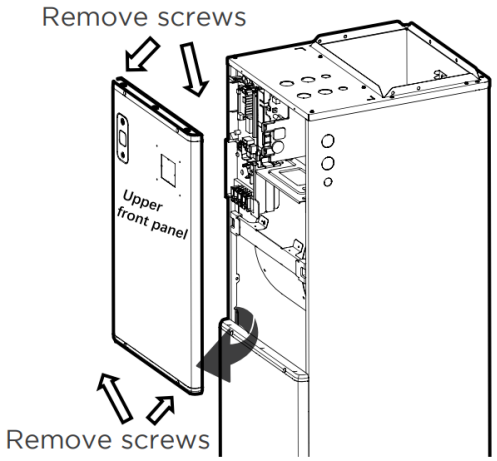
Model size selection:

For installations requiring supplemental heating, the optional electric heat module is available in sizes from 5kW to 20kW to accommodate appropriate sizing given to the specific heat load and electrical requirements of each installation. Please refer to the following table below for selections of available sizes of each model to avoid improper matching.

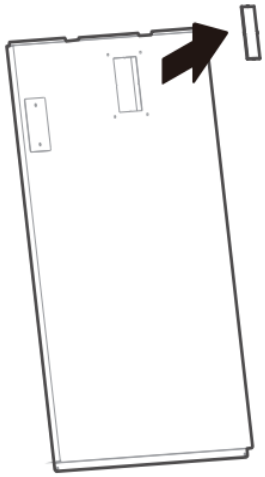
Indoor Unit Model (Btu/h)	5kW	8kW	10kW	15kW	20kW
24K	√	√	√	√	x
30K	√	√	√	√	x
36K	√	√	√	√	√
48K	x	√	√	√	√
60K	x	x	√	√	√

Auxiliary Heat Installation and Wiring:

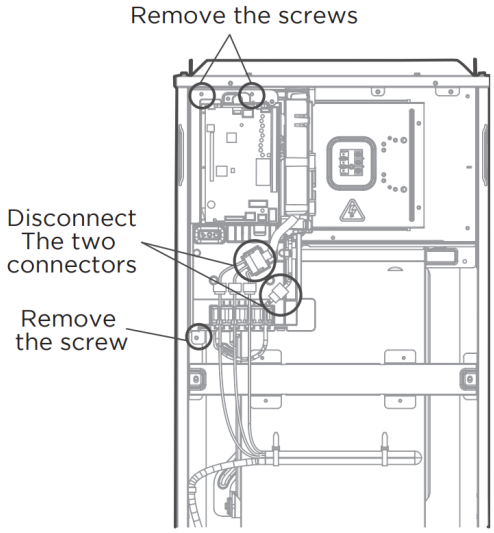
1. Open the upper cover.



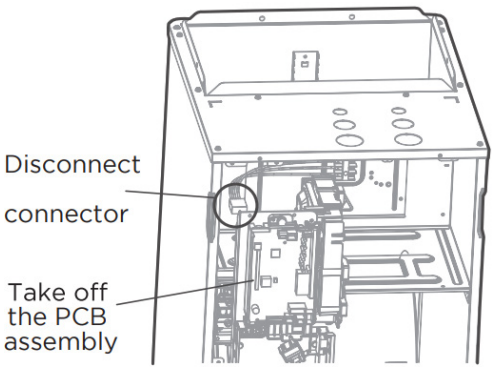
2. Use tools to remove the knock-out holes of the upper cover.



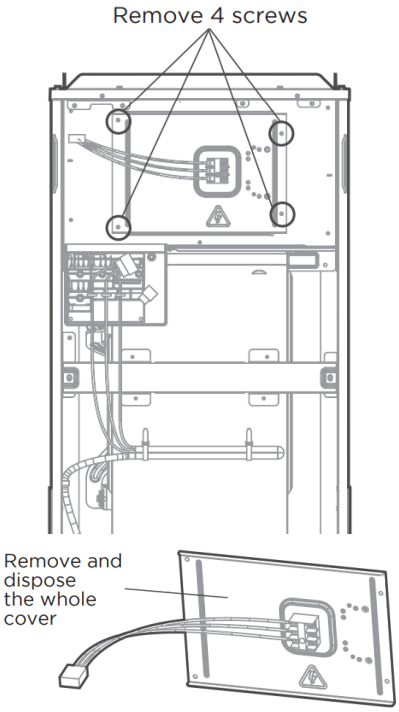
3.



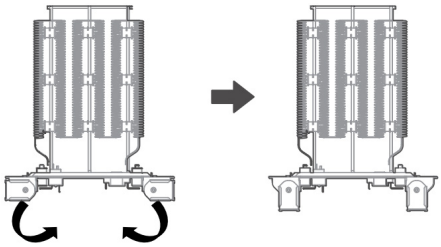
4.



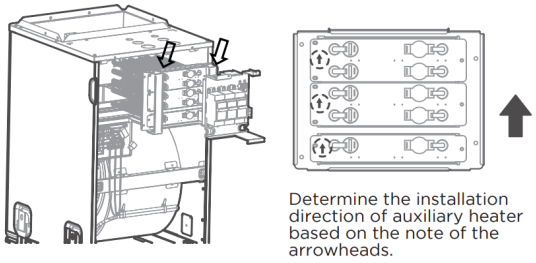
5.



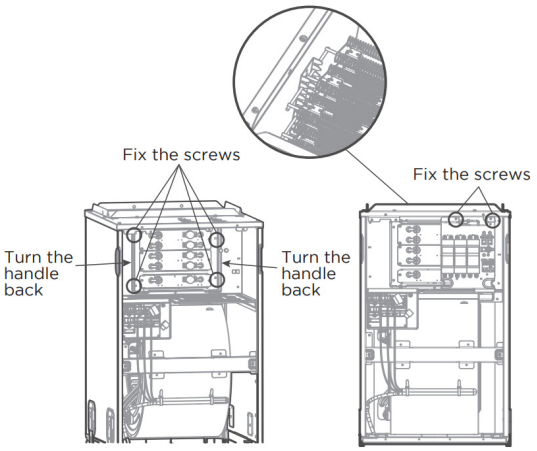
6. Turn the handles in the auxiliary heater.



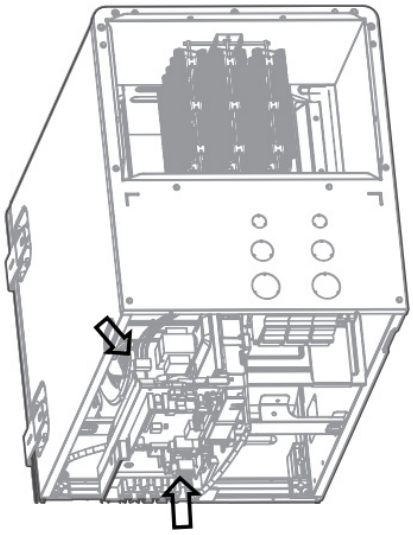
7. Hold the two handles together and push the auxiliary heater horizontally into the AHU.



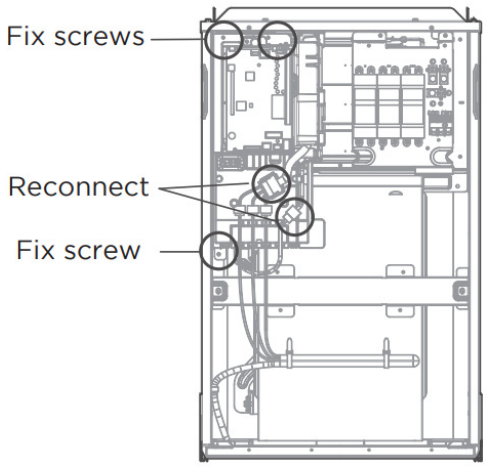
8. Turn the handles back and fix the screws.



9. Connect the connector from auxiliary heater onto the board assembly according to the wiring diagram.

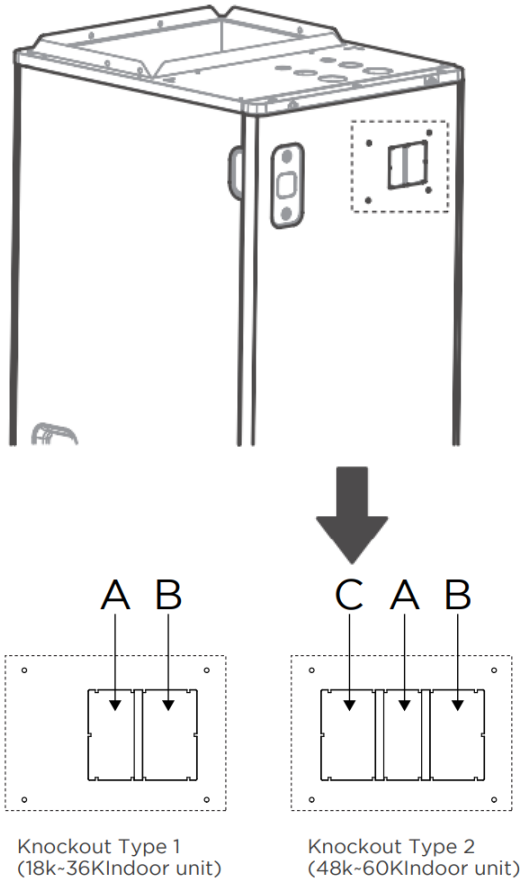


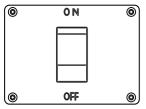
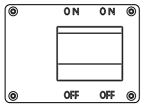
10. Install the PCB back and reconect the connector. Fix 3 screws.



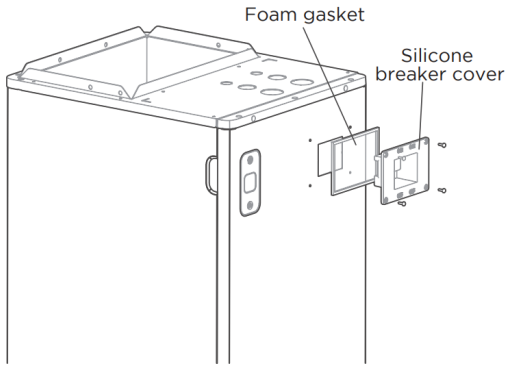
11. Wire according to the wiring diagram. Apply the wiring diagram on the inside cover after wiring is completed for future reference and maintenance.

12. Install the front panel and remove the knockout basing the different heater model.



Model	Knockout Which Needs to be Removed	Silicone Breaker Cover
5kw	A	Cover 1 
8kw		
10kw		
15kw	A+B	Cover 2 
20kw		

13. Fix foam gasket and install the silicone breaker cover with screws.



14. After installing the electric auxiliary heat module, apply the circuit breaker label near the silicone breaker cover that was just applied.

! CAUTION

POWER OFF BEFORE SERVICE.

Confirmation of Indoor Unit:

Note:

- The electric auxiliary heating wiring diagram is packed with the accessories.
- If the branch circuit wire length exceeds 100 ft, consult local code to determine maximum wire length.
- Use 2% voltage drop.

After the Electric Heating Wiring is Connected, Please Confirm Before Powering On:

- Check all wiring and ensure secure connections of all wiring.
- Ensure that the wire size is properly selected per local codes.

Specifications	Number of Circuit Breakers	Number of Relays	Number of Power Cord Groups	Number of Power Cord Grounding Screws
5kW	1	1	2	2
8kW	1	1	2	2
10kW	1	2	2	2
15kW	2	3	3	3
20kW	2	4	3	3

Use copper wire only to connect unit. If other than uncoated (non-plated) 75°C copper wire (solid wire for 10 AWG and smaller, stranded wire for larger than 10 AWG) is used consult applicable tables of the National Electric Code (ANSI/NFPA 70).

Note:

- The specification may be different between different models, please refer to the indoor unit's nameplate.

Auxiliary Heater Electrical Data:

Heater Part No.	Heater Kw	Internal Circuit Protection	Heater Amps	MCA (1)	MOP (1)	Heater Amps	MCA (2)	MOP (2)
UHK05	5	Ckt Bkr	18.0/20.0	23.0/27.0	25.0/30.0	/	/	/
UHK08	8	Ckt Bkr	28.8/32.0	37.0/42.0	40.0/45.5	/	/	/
UHK10	10	Ckt Bkr	36.0/40.0	46.0/53.0	50.0/60.0	/	/	/
UHK15	15	Ckt Bkr	18.0/20.0	23.0/27.0	25.0/30.0	36.0/40.0	46.0/53.0	50.0/60.0
UHK20	20	Ckt Bkr	36.0/40	46.0/53.0	50.0/60.0	36.0/40.0	46.0/53.0	50.0/60.0

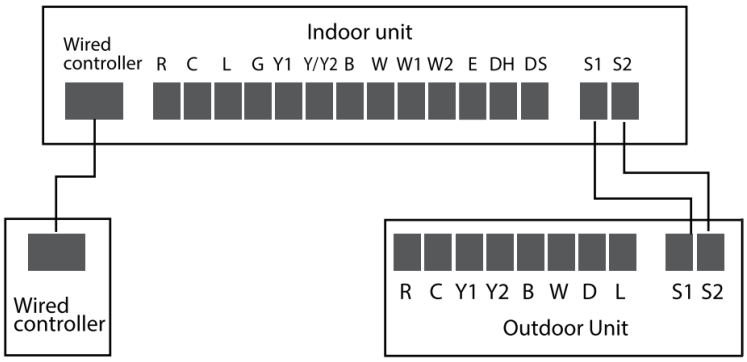
3.7 Electrical Wiring

Highlights of Electrical Wiring:

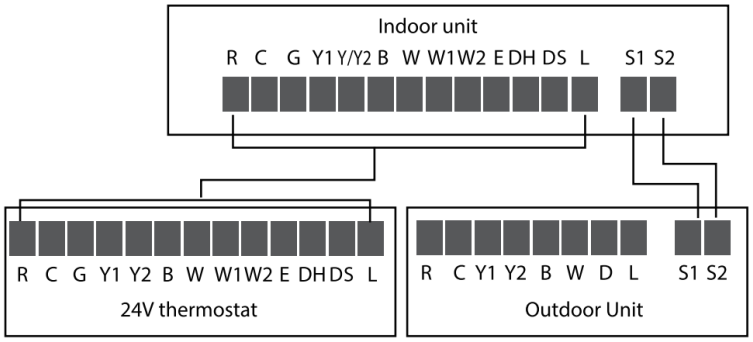
- All field wiring construction should be finished by a qualified electrician.
- Air conditioning equipment should be grounded according to the local electrical regulations.
- A current leakage protection switch should be installed.
- DO NOT connect the power wire to the terminal of the signal wire.
- When the power wire is parallel with the signal wire put the wires in their own conduit and gap them by 11.8in (300mm).
- According to the table in the indoor wiring make sure the selected wiring is not smaller than shown in the table.
- Select different colors for different wire according to relevant regulations.
- DO NOT use metal conduit in a place with acid or alkali corrosion. Switch to a plastic wire tube to replace it.
- DO NOT have a joint in the conduit, if one is required place into a connection box.
- The wiring with different voltage should not be in the same conduit.
- Ensure that the color of the wires of the outdoor terminal number and indoor correspond.

Specific Wiring Method:

Connection Method A:
Full Communication

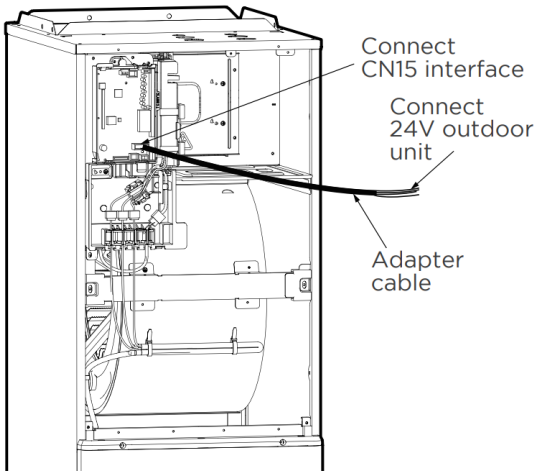


Connection Method B:
To use a 24V Thermostat

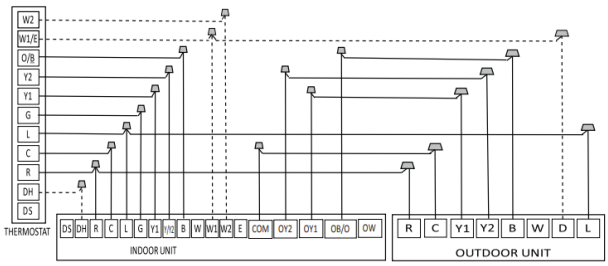


When using a 24V thermostat, please refer to the non-communicating wiring diagrams that follow:

Connection Method C:
The following wiring diagrams are suitable for the AHU and ODU with 24V thermostat.
Non-Communication scheme wiring reference.



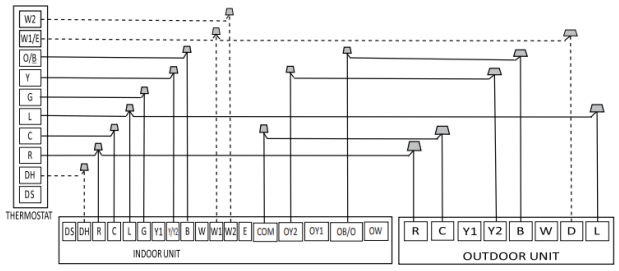
- Wiring for 4H and 2C thermostat



S4-2 Default on, DH function off. Turn switch off to activate DH function.

S4-4 Default on, W1 and W2 shorted for single stage Aux heat operation. Turn off to separate stages.

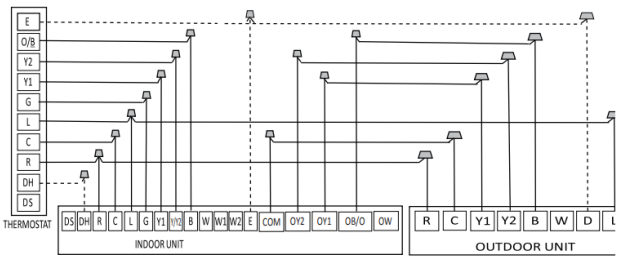
- Wiring for 3H and 1C thermostat



S4-2 Default on, DH function off. Turn switch off to activate DH function.

S4-4 Default on, W1 and W2 shorted for single stage Aux heat operation. Turn off to separate stages.

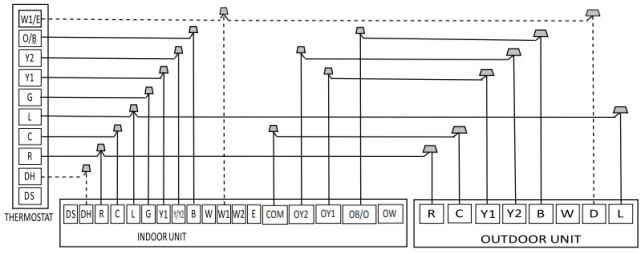
- Wiring for 3H and 2C thermostat



S4-2 Default on, DH function off. Turn switch off to activate DH function.

Emergency heating control two groups of electric heating at the same time

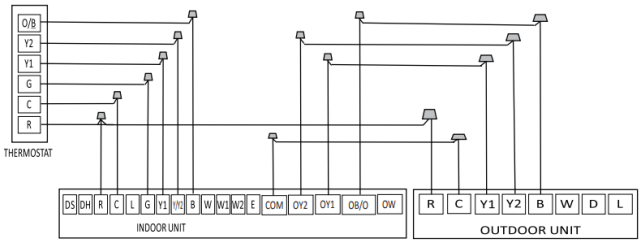
- Wiring for 3H and 2C thermostat



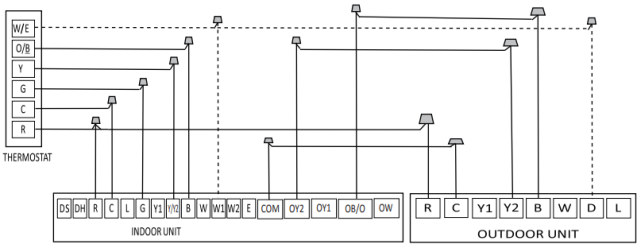
S4-2 Default on, DH function off. Turn switch off to activate DH function.

S4-4 Default on, W1 and W2 shorted for single stage Aux heat operation. Turn off to separate stages.

- Wiring for 2H and 2C thermostat

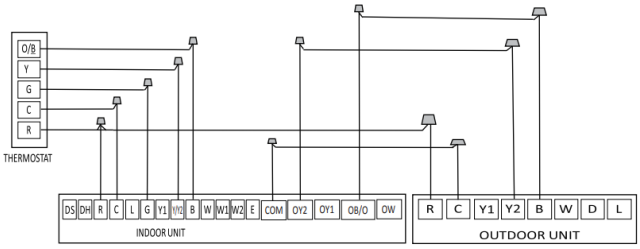


- Wiring for 2H and 1C thermostat

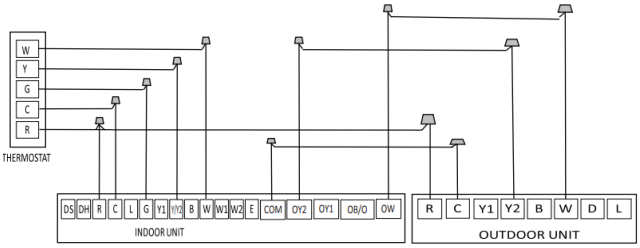


S4-4 Default on, W1 and W2 shorted for single stage Aux heat operation. Turn off to separate stages.

- Wiring for 1H and 1C thermostat



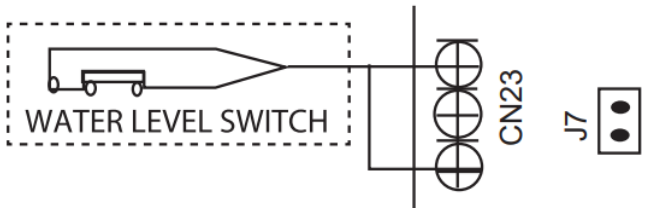
- Wiring for 1H and 1C thermostat



Optional Function Wiring:

Condensate Overflow Switch:

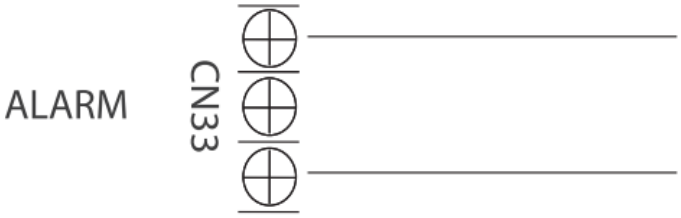
The unit will accommodate a remote condensate overflow switch. To enable, remove jumper J7 and connect he installer provided condensate overflow device to CN23 per below. When an overflow condition is present the device should open connection signaling the unit to turn off the system.



Fault Warning:

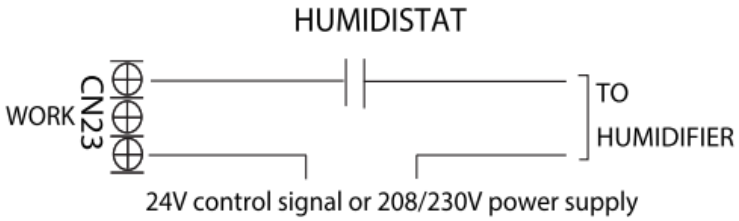
Alarm output:

An alarm output (CN33) can be utilized if actions are required when a fault is present. This is a passive outlet port so you will need to input a voltage signal. The relay is normally-open for normal operation and closed when a fault is active.



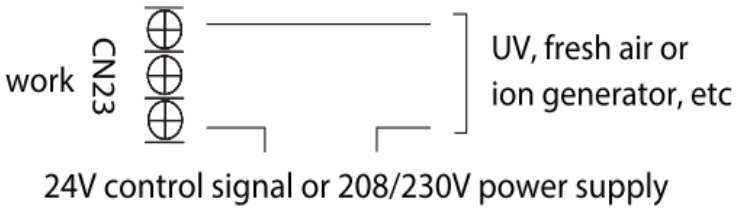
Humidifier Control:

To connect a humidifier, utilize the passive signal "WORK" output (CN23) port as well as the G and C wires on the controller and wire the humidistat and humidifier per the wiring diagram below. When the fan is running the CN23 relay will be closed which will allow power to the humidifier when the humidistat is below humidity set-point. If the thermostat or zone controller has a HUM interface, connect the humidifier directly to the HUM and C ports.



UV, Fresh air, or Negative Ion Wiring:

The WORK port is linked with the fan. When the fan is running the relay is closed; if an active 24V signal is required it can be directly connected to the G and C ports.



Control Logic:

Indoor Unit Connector:

Connector	Purpose
R	24V Power Connection
C	Common
G	Fan Control
Y1	Low Cooling
Y/Y2	High Cooling
B	Heating Reversing Valve
W	Heating Control
W1	Stage 1 Electric Heating
W2	Stage 2 Electric Heating
E/AUX	Emergency Heating
DH/BK	Dehumidification/Zoning Control
DS	Reserved Signal
L	System Fault Signal

KEY1 Instructions (Wired Controller Only):

- Press KEY1 to enter the forced automatic mode, press KEY1 again to enter the forced cooling mode (LED displays FC), and press KEY1 again to shut down.
- Long press KEY1 under forced cooling mode (LED displays FC) for 5 seconds to enter forced cooling mode.

4.1 24V Signal Chart

Mode	Priority	G	Y1	Y/Y2	B	W	W1	W2	E/AUX	DH	Fan Speed	Display
OFF	/	0	0	0	0	0	0	0	0	*	OFF	00
FAN	7	1	0	0	*	0	0	0	0	*	Low	01
Cooling Stage 1	6	*	1	0	0	0	0	0	0	1	Mid	02
Cooling Stage 2		*	*	1	0	0	0	0	0	1	High	03
Dehumidification 1		*	1	0	0	0	0	0	0	0	Low	04
Dehumidification 2		*	*	1	0	0	0	0	0	0	Low	05
Heat Pump Stage 1	5	*	1	0	1	0	0	A	0	1	Mid	06
Heat Pump Stage 2		*	*	1	1	0	0	A	0	1	High	07
Heat Pump Stage 2		*	*	*	*	1	0	A	0	1	High	
Electric Auxiliary Heat Module 1	3	*	0	0	*	0	1	A	0	*	Turbo	08
Electric Auxiliary Heat Module 2		*	0	0	*	0	0	1	0	*	Turbo	
Electric Auxiliary Heat Module 1 & 2		*	0	0	*	0	1	1	0	*	Turbo	09
Heat Pump Stage 1 + Electric Auxiliary Heat Module 1	1	*	1	0	1	0	1	0	0	1	Turbo	10
Heat Pump Stage 1 + Electric Auxiliary Heat Module 2		*	*	0	1	0	0	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1		*	*	1	1	0	1	0	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1		*	*	*	*	1	1	0	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 2		*	*	1	1	0	0	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 2		*	*	*	*	1	0	1	0	1	Turbo	
Heat Pump Stage 1 + Electric Auxiliary Heat Module 1 & 2		*	1	0	1	0	1	1	0	1	Turbo	11
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1 & 2		*	*	1	1	0	1	1	0	1	Turbo	
Heat Pump Stage 2 + Electric Auxiliary Heat Module 1 & 2		*	*	*	*	1	1	1	0	1	Turbo	
Emergency Heat	1	*	*	*	*	*	*	*	1	*	Turbo	12
Heating Zone Control	2	*	1	0	1	0	*	*	0	0	Low	13
Heating Zone Control		*	*	1	1	0	*	*	0	0	Low	
Heating Zone Control		*	*	*	*	1	*	*	0	0	Low	

Note:
1: 24V signal
0: No 24V signal
*: 1 or 0
The AHU will turn off if the 24V input cannot meet the table.

4.2 Safety Features

Indoor Fan Delay Operation:

- When the unit starts the indoor fan will operate after a period of time.
- If the unit is in heating mode the indoor fan is regulated by the anti-cold wind function.

Sensor Redundancy and Automatic Shutoff:

- If one temperature sensor malfunctions, the air conditioner continues operation and displays the corresponding error code allowing for emergency use.
- When more than one temperature sensor is malfunctioning, the air handler ceases operation.

4.3 Basic Functions

Unit Element Abbreviations:

Abbreviation	Element
T1	Indoor room temperature sensor
T2	Evaporator coil temperature sensor
T3	Condenser coil temperature sensor
T4	Outdoor ambient temperature sensor
TP	Compressor discharge temperature
TS	Setting temperature
Tsc	Adjusted setting temperature

In this manual, such as CDIFTEMP, HDIFTEMP2, TCDE1, TCDE2,...etc, they are well-setting parameter of EEPROM.

Fan Mode:

When Fan Mode is Activated:

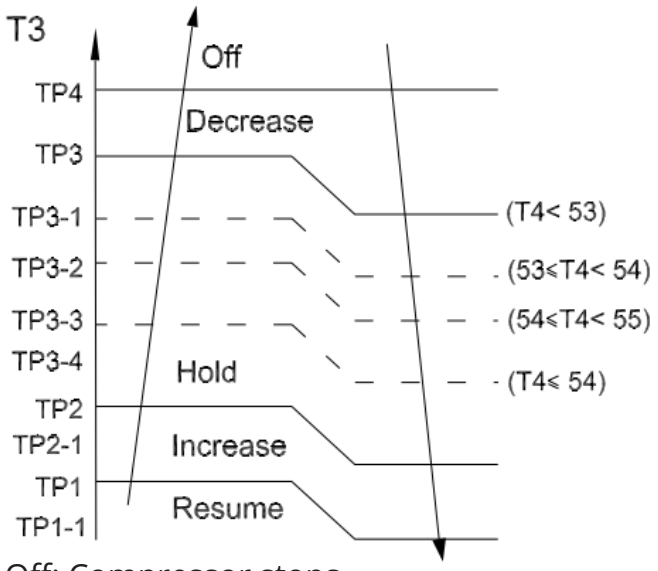
- Temperature control is disabled and no temperature setting is displayed.
- The indoor fan speed can be set to low, medium, high, turbo, and auto.
- Auto fan: In fan-only mode the system operates the same as auto fan in cooling mode with the temperature set at 75°F (24°C).
- Under 24V control, when only G signal is available when switching from heating mode or emergency heating mode to fan mode, T4<50°F (10°C), the heating mode is sent to the outdoor; when T4>53.6°F (12°C), the normal outdoor control if resumed, the fan mode is sent to the outdoor

Cooling Mode:

Indoor Fan Control:

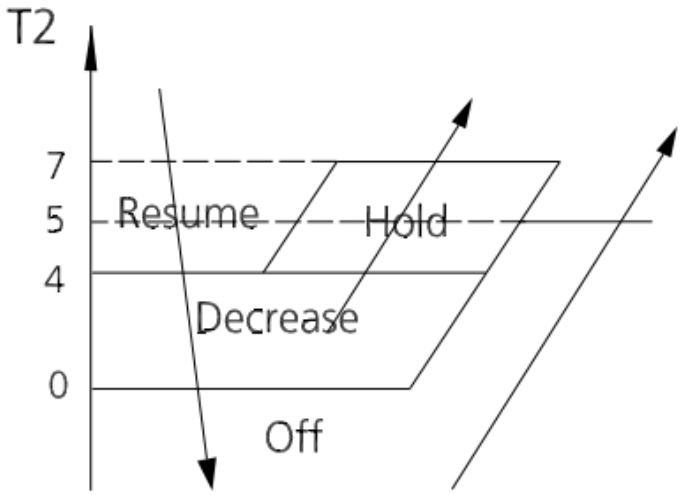
1. In cooling mode, the indoor fan operates continuously. The fan speed can be set to low, medium, high, turbo, and auto.
2. Auto fan action in cooling mode:
   - Descent curve
     - When T1-Tsc is lower than 6.3°F (3.5°C), the fan speed reduces to high.
     - When T1-Tsc is lower than 1.8°F (1°C), the fan speed reduces to medium.
     - When T1-Tsc is lower than 0.9°F (0.5°C), the fan speed reduces to low.
   - Rise curve
     - When T1-Tsc is higher than or equal to 1.8°F (1°C), the fan speed increases to medium.
     - When T1-Tsc is higher than or equal to 2.7°F (1.5°C), the fan speed increases to high.
     - When T1-Tsc is higher than or equal to 7.2°F (4°C) the fan speed increases to turbo.

Condenser Temperature Protection:



- Off: Compressor stops.
- Decrease: Decrease the running frequency to the lower level at 0.04Hz/s.
- Hold: Keep the current frequency.
- Increase: Increase the running frequency to the higher level at 1Hz/s.
- Resume: No limitation for frequency.

Evaporator Temperature Protection:

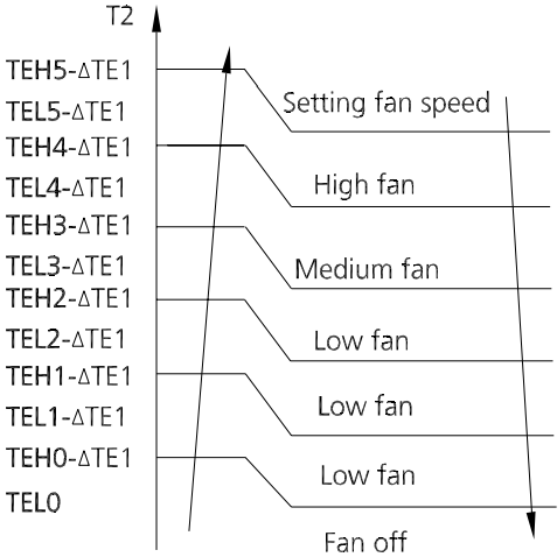


- Off: Compressor stops.
- Decrease: Decrease the running frequency to the lower level per 1 minute.
- Hold: Keep the current frequency.
- Resume: No limitation for frequency.

Heating Mode:

Indoor Fan Control:

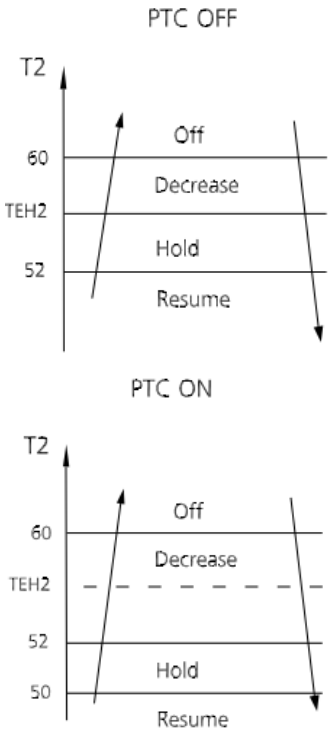
1. In heating mode, the indoor fan operates continuously. The fan speed can be set to low, medium, high, turbo, and auto.
   - Anti-cold air function
   - The indoor fan is controlled by the indoor temperature T1 and the indoor unit coil temperature T2.



T1≥66°F (19°C)	ΔTE1=0
59°F (15°C)≤T1,66°F (19°C)	ΔTE1=66°F (19°C)-T1
T1<59°F (15°C)	ΔTE1=7.2°F (4°C)

2. Auto fan action in heating mode:
   - Rise curve
     - When T1-Tsc is higher than -2.7°F (-1.5°C), the fan speed reduces to high.
     - When T1-Tsc is higher than 0°F (0°C), the fan speed reduces to medium.
     - When T1-Tsc is higher than 0.9°F (0.5°C), the fan speed reduces to low.
   - Descent curve
     - When T1-Tsc is lower than or equal to 0°F (0°C), the fan speed increases to medium.
     - When T1-Tsc is lower than or equal to -2.7°F (-1.5°C), the fan speed increases to high.
     - When T1-Tsc is lower than or equal to -5.4°F (-3°C), the fan speed increases to turbo.

Evaporator Coil Temperature Protection:



- Off: Compressor stops
- Decrease: Decrease the running frequency to the lower level per 20 seconds.
- Hold: Keep the current frequency.
- Resume: No limitation for frequency.

Auto Mode:

- This mode can be selected with the remote controller and the temperature setting can be adjusted between 60.8°F (16°C)~86°F (30°C).
- In auto mode the machine selects cooling, heating, or fan-only mode on the basis of ΔT(ΔT=T1-TS).

ΔT	Running mode
ΔT>3.6°F (2°C)	Cooling
-5.4°F (-3°C)<ΔT≤3.6°F (2°C)	Fan-only
ΔT≤-5.4°F (-3°C)	Heating

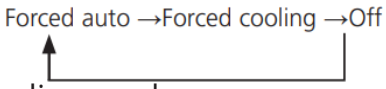
- Indoor fan will run at auto fan speed.
- If the machine switches modes between heating and cooling, the compressor will keep stopping for a certain period of time and then choose mode according to ΔT.

Drying Mode:

- In drying mode, the system operates the same as auto fan in cooling mode.
- All protections are activated and operate the same as they do in cooling mode.
- Low room temperature protection:
  If the room temperature is lower than 50°F (10°C), the compressor ceases operation and does not resume until the room temperature exceeds 53.6°F (12°C).

Forced Operation Function:

Press the AUTO/COOL button, the system will run as below sequence:



- Forced cooling mode:
  The compressor and outdoor fan continue to run and the indoor fan will run at breeze speed. After running for 30 minutes, the system will switch to auto mode with a preset temperature of 76°F (24°C).
- Forced auto mode:
  Forced auto mode operates the same as normal auto mode with a preset temperature of 76°F (24°C).
- The unit will exit forced operation when it receives the following signals:
  - Switch off
  - Receives the remote signal to change the running mode.

Timer Function:

- The timing range is 24 hours.
- Time On: The machine turns on automatically at the preset time.
- Timer Off: The machine turns off automatically at the preset time.
- Timer On/Off: The machine turns on automatically at the preset On time and turns off automatically at the preset Off time.
- Timer Off/ON: The machine turns off automatically at the preset Off time and then turns on automatically at the preset ON time.
- The timer does not change the units operation mode. If the unit is off it will not start immediately after the "timer off" function is set. When the setting time is reached, the timer LED switches off and the units running mode remains unchanged.
- The timer uses relative time, not clock time.

Sleep Function:

- The sleep function is available in cooling, heating, auto mode, or heat pump+electric heat.
- The operational process for sleep mode is as follows:
  - When cooling, the set temperature rises by 1.8°F (1°C) (no higher than 86°F (30°C)) every hour. After 2 hours the temperature stops rising and the indoor fan is fixed at low speed.
  - When heating, the set temperature decreases by 1.8°F (1°C) (no lower than 60.8°F (16°C)) every hour. After 2 hours the temperature stops decreasing and the indoor fan is fixed at low speed. The anti-cold wind function takes priority.
  - When in auto mode, the fan speed is also fixed at low speed. After 1 hour if the actual operation mode is cooling mode, the set temperature will rise by 1.8°F (1°C), if it is in heating mode the set temperature will decrease by 1.8°F (1°C), if it is in fan mode the set temperature will not change and the set temperature will not change after two hours of operation.
- The timer setting is available in this mode.

Auto-Restart Function:

- The indoor unit has an auto-restart module that allows the unit to restart automatically. The module automatically stores the current settings and in case of sudden power failure it will restore those settings automatically within 3 minutes after power returns.

5.1 Error Display (Indoor Unit)

When the indoor unit encounters a recognized error, the operation lamp will flash in a corresponding series, the timer lamp may turn on or begin flashing, and an error code will be displayed. These error codes are described in the following table:

Display	Error Information	Solution
EC 07	ODU fan speed out of control	TS21
EC 0d	ODU malfunction	TS38
EC 51	ODU EEPROM parameter error	TS19
EC 52	ODU coil temp. sensor (T3) error	TS23
EC 53	ODU ambient temp. sensor (T4) error	TS23
EC 54	COMP. discharge temp. sensor (TP) error	TS23
EC 56	IDU coil outlet temp. sensor (T2B) error (Multi-Zone)	TS23
EC C1	Other IDU refrigerant sensor detects leakage (Multi-Zone)	TS35
EH 00	IDU EEPROM malfunction	TS19
EH 03	IDU fan speed out of control	TS21
EH 0A	IDU EEPROM parameter error	TS19
EH 0B	IDU main control board & display board communication error	TS39
EH 0E	Water-level alarm malfunction	TS25
EH 3A	External fan DC bus voltage is too low	TS35
EH 3B	External fan DC bus voltage is too high	TS35
EH 60	IDU room temp. sensor (T1) error	TS23
EH 61	IDU coil temp. sensor (T2) error	TS23
EH 62 / EH 66	Evaporator coil inlet temperature sensor T2B is in open circuit or short circuit	TS23
EH 65	Evaporator coil temperature sensor T2A is in open circuit or short circuit	TS23
EH BA	Communication malfunction between indoor unit and external fan module	TS35
EH C1	Refrigerant sensor detects leakage	TS37
EH C2	Refrigerant sensor is out of range and leakage is detected	TS37
EH C3	Refrigerant sensor is out of range	TS36
EL 01	IDU & ODU communication error	TS20
EL 0C	System lacks refrigerant	TS23
EL 16	Communication malfunction between adapter board and outdoor main board	TS40
FH CC	Refrigerant sensor error	TS36
FL 09	Mismatch between the new and old platforms	TS40
PC 00	ODU IPM module protection	TS26
PC 01	ODU voltage protection	TS27
PC 02	Compressor top (or IPM) temp. protection	TS32
PC 03	Pressure protection (low or high pressure)	TS29
PC 04	Inverter compressor drive error	TS28
PC 0L	Low ambient temperature protection	TS33
----	IDUs mode conflict (Multi-Zone)	--
EH B3	Communication malfunction between wire & master control (for wired controller)	TS34

WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. While checking the indoor/outdoor PCB, please equip yourself with anti-static gloves or a wrist strap to avoid damaging the board.
Electricity will remain in capacitors even when the power supply is off. Ensure the capacitors are fully discharged before troubleshooting.

For other errors:

The display board may show a garbled code or a code undefined by the service manual. Ensure that this code is not a temperature reading.

LED Flash Frequency:

5.2 Information Inquiry

In order to enter engineering mode and check the data of the system, use the following steps:

- Ensure the unit is in standby status, or working normally in non-locked conditions.
- Press both "Power" and "Fan" buttons together simultaneously for 7 seconds until the remote screen shows "0". The "Auto", "Cool", "Dry", "Heat", and "Battery" icons will be displayed at the same time.
- Press the "Up" or "Down" button to choose the different channel number that you want to check. (from 0-30) on the remote control, and the display will show the parameter value.

Channel	Code	Meaning	Remark
0		Error Code	Refer to the next list of error codes: Empty means no error
1	T1	Room Temperature	Actual data, °C/°F
2	T2	Indoor Coil Temperature	Actual data, °C/°F
3	T3	Outdoor Coil Temperature	Actual data, °C/°F
4	T4	Ambient Temperature	Actual data, °C/°F
5	TP	Discharge Temperature	Actual data, °C/°F
6	FT	Targeted Frequency	Actual data
7	Fr	Actual Frequency	Actual data
8	dL	Running Current	3.2A = 3
9	Ac	AC Voltage	
10	Sn	Reserved	
11	nA	Reserved	
12	Pr	Indoor Air Flow	Actual Data / 10
13	Lr	EXV opening steps	Actual Data / 8
14	Ir	Indoor fan speed	Actual Data / 8
15	Hu	Humidity (if sensor is present)	Actual Data, %
16	TT	Set temperature including compensation	Actual Data, °C
17	nA	Reserved	
18	nA	Reserved	
19	Uo	Outdoor DC bus voltage	
20	oT	Target Frequency calculated by indoor	Without limitation
21	TA	Evaporator coil inlet temperature	Actual data, °C/°F
22	Tb	Evaporator coil inlet temperature	Actual data, °C/°F
23 ~30	nA	Reserved	

Note:

1. The channel number indicates a certain parameter value (check the table below).
2. The indoor unit display will show the code for 2 seconds, then the parameter value.
3. In engineering mode, the other keys or operations are invalid except for the "Power", "Up", "Down", and "OK" buttons.
4. To exit from engineering mode, press the "Power" and "Fan" buttons together for 2 seconds to quit and return to the home screen.
5. The engineering mode will automatically end and return to the home screen if there is no activity for 60 seconds.

Display	Error Information
EH 00	IDU EEPROM malfunction
EH 0A	IDU EEPROM parameter error
EL 01	IDU & ODU communication error
EH BA	Communication error between the indoor unit and external fan module
EH 30	Parameters error of indoor external fan
EH 35	Phase failure of indoor external fan
EH 37	Indoor external fan zero speed failure
EH 38	Indoor external fan stall failure
EH 39	Out of step failure of indoor external fan
EH 3A	Low voltage protection of indoor external fan DC bus
EH 3B	Indoor external fan DC bus voltage is too high
EH 3E	Indoor external fan overcurrent fault
EH 3F	Indoor external fan module protection/hardware overcurrent protection
EH 03	IDU fan speed out of control
EC 51	ODU EEPROM parameter error
EC 52	ODU coil temperature sensor (T3) error
EC 53	ODU ambient temperature sensor (T4) error
EC 54	COMP. discharge temperature sensor (TP) error
EC 55	IGBT temperature sensor TH is in open circuit or short circuit
EC 0D	Outdoor unit malfunction
EH 60	IDU room temperature sensor (T1) error
EH 61	IDU coil temperature sensor (T2) error
EC 71	Outdoor external fan overcurrent fault
EC 75	Outdoor external fan module protection/hardware overcurrent protection
EC 72	Outdoor external fan phase failure
EC 74	Outdoor external fan current sampling bias fault
EC 73	Zero speed failure of outdoor unit DC fan
EC 07	ODU fan speed out of control
EH B5	Intelligent eye communication failure
EL 0C	Refrigerant leak detected
EH 0E	Water-level alarm malfunction
EH 0F	Intelligent eye malfunction
FH 07	Communication malfunction between indoor unit and auto-lifting panel
PC 00	ODU IPM module protection
PC 10	Over low voltage protection
PC 11	Over voltage protection
PC 12	DC voltage protection
PC 02	Top temperature protection of compressor or High temperature protection of IPM module
PC 40	Communication error between outdoor main chip and compressor driven chip
PC 41	Current Input detection protection
PC 42	Compressor start error

Display	Error Information
PC 43	Lack of phase (3 phase) protection
PC 44	Outdoor unit zero speed protection
PC 45	341 PWM error
PC 46	Compressor speed malfunction
PC 49	Compressor over current protection
PC 06	Compressor discharge temperature protection
PC 08	Outdoor current protection
PH 09	Anti-cold air in heating mode
PC 0f	PFC module malfunction
PC 30	System overpressure protection
PC 31	System pressure is too low
PC 03	Pressure protection
PC 0l	Outdoor low ambient temperature protection
PH 90	Evaporator coil temperature too high
PH 91	Evaporator coil temperature too low
PC 0A	Condenser high temperature protection
PH 0C	Indoor unit humidity sensor failure
LH 00	Frequency limit caused by T2
LH 30	Indoor external fan current limit
LH 31	Indoor external fan voltage limit
LC 01	Frequency limit caused by T3
LC 02	Frequency limit caused by TP
LC 05	Frequency limit caused by voltage
LC 03	Frequency limit caused by current
LC 06	Frequency limit caused by PFC
LC 30	Frequency limit caused by high pressure
LC 31	Frequency limit caused by low pressure
LH 07	Frequency limit caused by a remote control
--	IDUs mode conflict (match with multi-outdoor unit)
NA	No malfunction and protection

5.3 Advanced Function Setting

In order to enter to Check the Advanced Function Settings and Enter Engineering Mode please follow these steps:

1. First you will need to disconnect power from the unit and wait for 1 minute.
2. Then connect the power supply again to the unit (the system should enter standby).
3. Press "Power" + "Fan" buttons together for 7s until the remote controller screen shows "0", and also "Auto, Cool, Dry, Heat, battery" icons will be displayed at the same time.
4. Press the "Up" or "Down" buttons to choose different channel numbers that you want to check (from 0-30) on the remote controller.
5. Then press the "Power" button for 2s until the remote controller screen shows "Ch".
6. Press the "Ok" button to query the current function set value while the remote controller shows "Ch" and the function set value will be shown on the indoor units display.

If you want to change the Current Functions Set Value:

1. First you will need to disconnect power from the unit and wait for 1 minute.
2. Then connect the power supply again to the unit (the system should enter standby).
3. Press "Power" + "Fan" buttons together for 7s until the remote controller screen shows "0", and also "Auto, Cool, Dry, Heat, battery" icons will be displayed at the same time.
4. Press the "Up" or "Down" buttons to choose different channel numbers that you want to check (from 0-30) on the remote controller.
5. Then press the "Power" button for 2s until the remote controller screen shows "Ch".
6. Then press the "Up" or "Down" button to choose the desired set value from the screen of the remote control.
7. The press "Ok" to send the new set value to the indoor unit and the indoor unit will display "CS" which means that the new set value is uploaded successfully.
8. Finally disconnect the power supply again from the unit and wait for 10 minutes, then connect it again.

Please Note:

1. The channel number indicates a certain function and each number shown on the indoor units screen indicates the current function set value (Reference table below).
2. In the engineering mode, the other keys or operations are invalid except for the following buttons "Power", "Up", "Down", and "Ok".
3. In order to set a new set value successfully you need to finish the steps (from 2-7) within 1 minute.
4. The engineering mode will be exited if there is no valid input data for 60s.
5. In order to exit engineering mode, please follow these steps:

- Press "Power" button for 2s until the remote controls screen shows "0".
- Then press "Power" + "Fan" buttons together for 2s to quite the engineering mode and return back to the home screen.

Channel	Function	Parameter Value Meaning	Remark
0	Capacity setting (Btu/h)	1-100K	
1	Auto-restart function	0-Inactive 1-Active	
2	Fan control when Ts reached	1-Fan stop 2-Fan runs at lowest RPM 3-Fan runs at setting RPM 4-Fan stops for 4 mins. and runs for 1 min. 5-Fan stops for 8 mins. and runs for 1 min. 6-Fan stops for 16 mins. and runs for 1 min. 7-Fan stops for 24 mins. and runs for 1 min. 8-Fan stops for 48 mins. and runs for 1 min. 9-Fan stops for 15 mins. and runs for 2.5 min. 10-Fan stops for 30 mins. and runs for 2.5 min. 11-Fan stops for 60 mins. and runs for 2.5 min. 12-Fan runs at setting RPM, but stops if you choose automatic speed 13-Fan runs at lowest speed, but will stop if you choose automatic speed	
3	Mode lock	CH-Cooling and heating (all modes) HH-Heating only (heating + fan only) CC-Cooling only (cooling + drying + fan only) nU-Cooling and heating without auto	Remote controller will change as well
4	Lowest setting temperature	16-24	Remote controller will change as well
5	Highest setting temperature	25-30	Remote controller will change as well
6	Reserved	Nothing to set	
7	/	Nothing to set	
8	/	Nothing to set	
9	/	Nothing to set	
10	/	Nothing to set	
11	Min. frequency limitation in cooling mode	10,11,12,...,49,50,--(Cancel)	
12	Min. fequency limitation in heating mode	10,11,12,...,49,50,--(Cancel)	
13	Max. frequency selection in T4 limitation of Zone6	20,21,22,...,149,150,--(Cancel)	
14	/	Nothing to set	
15	Frequency selection of outdoor forced-operation	10,11,12,...,249,250,--(Cancel)	
16	One button reset	rS - Reset	
17	nA	Nothing to set	
18	Capacity setting(kW)	23,26,32,35,51,72,120,--,(Cancel)	

Channel	Function	Parameter Value Meaning	Remark
19	Max. frequency selection in cooling mode	40,41,42,...,83,84,--(Cancel)	
20	Max. frequency selection in heating mode	40,41,42,...,83,84,--(Cancel)	Without limitation
21	Cooling temperature compensation	-3.0,-2.5,-2.0,...,3.0,3.5,--(Cancel)	
22	Heating temperature compensation	-6.5,-6.0,-5.5,...,0.5,1.0,1.5,...,7.0,7.5,--(Cancel	
23	Fan volume selection in cooling	Fan volume will add set data*20cfm	
24	Reserved	Nothing to set	
25	Fan volume selection in heating	Fan volume will add set data*20cfm	
26	Reserved	Nothing to set	
27	Defrosting type	A0-Normal defrosting A1-Enhanced defrosting	
28	Anti-cold air Stop Fan Temperature	16~28	
29	Reserved	Nothing to set	
30	Reserved	Nothing to set	

5.4 Error Diagnosis Without Error Code

WARNING

Be sure to turn off unit before any maintenance to prevent damage or injury.

Remote Maintenance:

Suggestion: When troubles occur, please check the following points with the customer before field maintenance.

No.	Problem	Solution
1	Unit will not start	TS14-TS15
2	The power switch is on but fans will not start	TS14-TS15
3	The temperature on the display board cannot be set	TS14-TS15
4	Unit is on but the air is not cold/hot	TS14-TS15
5	Unit runs but shortly stops	TS14-TS15
6	The unit starts up and stops frequently	TS14-TS15
7	Unit runs continuously but insufficient cooling/heating	TS14-TS15
8	Cool cannot change to heat	TS14-TS15
9	Unit is noisy	TS14-TS15

Field Maintenance:

No.	Problem	Solution
1	Unit will not start	TS16-TS17
2	Compressor will not start but fans run	TS16-TS17
3	Compressor and condenser fan will not start	TS16-TS17
4	Air handler fan will not start	TS16-TS17
5	Condenser fan will not start	TS16-TS17
6	Unit runs but shortly stops	TS16-TS17
7	Compressor short-cycles due to overload	TS16-TS17
8	High suction pressure	TS16-TS17
9	Low discharge pressure	TS16-TS17
10	High suction pressure	TS16-TS17
11	Low suction pressure	TS16-TS17
12	Unit runs continuously but insufficient cooling	TS16-TS17
13	Too cool	TS16-TS17
14	Compressor is noisy	TS16-TS17
15	Horizontal louver cannot revolve	TS16-TS17

1. Remote Maintenance	Electrical Circuit								Refrigerant Circuit					
Possible causes of trouble	Power failure	The main power tripped	Loose connections	Faulty transformer	The voltage too high or too low	The remote control is powered off	Broken the remote control	Dirty air filter	Dirty condenser fins	The setting temperature is higher/lower than the room's(cooling/heating)	The ambient temperature is too high/ low when the mode is cooling/heating	Fan mode	Silence function is activate	Frosting and defrosting frequency
Unit will not start	√	√	√	√	X	X	X	X	X	X	X	X	X	X
The power switch is on but fans will not start	X	X	√	√	√	X	X	X	X	X	X	X	X	X
The temperature on the playboard cannot be set	X	X	X	X	X	√	√	X	X	X	X	X	X	X
Unit is on but the air is not cold/hot	X	X	X	X	X	X	X	X	X	√	√	√	X	X
Unit runs but shortly stops	X	X	X	X	√	X	X		X	√	√	X	X	X
The unit startup and stops frequently	X	X	X	X	√	X	X	X	X	X	√	X	X	√
Unit runs continuously but insufficient cooling/ heating	X	X	X	X	X	X	X	√	√	√	√	X	√	X
Cool cannot change to heat	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Unit is noisy	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test method/ remedy	Test voltage	Close the power switch	Inspect connections - tighten	Change the transformer	Test voltage	Replace the battery of the remote control	Replace the remote control	Clean or replace	Clean	Adjust the setting temperature	Turn on the unit later	Adjust to cool mode	Turn off the silence function	Turn on the unit later

1. Remote Maintenance	Others					
Possible causes of trouble	Heavy load condition	Loosen hold down bolts or screws	Bad airproof	The air inlet or outlet of either unit is blocked	Interference from cell phone towers and remote boosters	Shipping plates remain attached
Unit will not start	X	X	X	X	X	X
The power switch is on but fans will not start	X	X	X	X	√	X
The temperature on the playboard cannot be set	X	X	X	X	X	X
Unit is on but the air is not cold/hot	X	X	X	X	X	X
Unit runs but shortly stops	X	X	X	X	X	X
The unit startup and stops frequently	X	X	X	√	X	X
Unit runs continuously but insufficient cooling/ heating	√	X	√	√	X	X
Cool cannot change to heat	X	X	X	X	X	X
Unit is noisy	X	√	X	X	X	√
Test method/ remedy	Check heat load	Tighten bolts and screws	Close all windows and doors	Remove the obstacles	Reconnect the power or press ON/OFF button on the remote to restart operation	Remove item

2. Field Maintenance	Refrigerant Circuit								Others													
Possible causes of trouble	Compressor stuck	Shortage of refrigerant	Restricted liquid line	Dirty air filter	Dirty evaporator coil	Insufficient air through evaporator coil	Overcharge of refrigerant	Dirty or partially blocked condenser	Air or incompressible gas in refrigerant cycle	Short cycling of condensing air	High temperature condensing medium	Insufficient condensing medium	Broken compressor internal parts	Inefficient compressor	Expansion valve obstructed	Expansion valve or capillary tube close completely	Leaking power element on expansion valve	Poor installation of feeler bulb	Heavy load condition	Loosen hold down bolts and/or screws	Shipping plates remain attached	Poor choices of capacity	Contact of piping with other piping or external plate
Unit will not start	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Compressor will not start but fans run	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Compressor and condenser fan will not start	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Air handler fan will not start	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Condenser fan will not start	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Unit runs but shortly stops	X	√	√	X	X	X	√	√	X	X	X	X	X	X	X	√	√	X	X	X	X	X	X
Compressor short-cycles due to overload	X	√	X	X	X	X	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
High discharge pressure	X	X	X	X	X	X	√	√	√	√	√	√	X	X	X	X	X	X	X	X	X	X	X
Low discharge pressure	X	√	X	X	X	X	X	X	X	X	X	X	X	√	X	X	X	X	X	X	X	X	X
Test method/ remedy	Replace the compressor	Leak test	Replace restricted part	Clean or replace	Clean coil	Check fan	Change charged refrigerant volume	Clean condenser or remove obstacle	Purge, evacuate and recharge	Remove obstruction to air flow	Remove obstruction in air or water flow	Remove obstruction in air or water flow	Replace compressor	Test compressor efficiency	Replace valve	Replace valve	Replace valve	Fix feeler bulb	Check heat load	Tighten bolts or screws	Remove them	Choose system of larger capacity or add another system	Rectify piping so as to not contact with each other or with external plate

2. Field Maintenance	Refrigerant Circuit								Others													
Possible causes of trouble	Compressor stuck	Shortage of refrigerant	Restricted liquid line	Dirty air filter	Dirty evaporator coil	Insufficient air through evaporator coil	Overcharge of refrigerant	Dirty or partially blocked condenser	Air or incompressible gas in refrigerant cycle	Short cycling of condensing air	High temperature condensing medium	Insufficient condensing medium	Broken compressor internal parts	Inefficient compressor	Expansion valve obstructed	Expansion valve or capillary tube close completely	Leaking power element on expansion valve	Poor installation of feeler bulb	Heavy load condition	Loosen hold down bolts and/or screws	Shipping plates remain attached	Poor choices of capacity	Contact of piping with other piping or external plate
High suction pressure	X	X	X	X	X	X	√	X	X	X	X	X	X	√	X	X	X	√	√	X	X	X	X
Low suction pressure	X	√	√	√	√	√	X	X	X	X	X	X	X	X	√	√	√	X	X	X	X	X	X
Unit runs continuously but insufficient cooling	X	√	√	√	√	√	X	√	√	√	X	X	X	√	X	X	X	X	√	X	X	√	X
Too Cool	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Compressor is noisy	X	X	X	X	X	X	√	X	X	X	X	X	√	X	X	X	X	X	X	√	√	X	√
Horizontal louver cannot revolve	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test method/ remedy	Replace the compressor	Leak test	Replace restricted part	Clean or replace	Clean coil	Check fan	Change charged refrigerant volume	Clean condenser or remove obstacle	Purge, evacuate and recharge	Remove obstruction to air flow	Remove obstruction in air or water flow	Remove obstruction in air or water flow	Replace compressor	Test compressor efficiency	Replace valve	Replace valve	Replace valve	Fix feeler bulb	Check heat load	Tighten bolts or screws	Remove them	Choose system of larger capacity or add another system	Rectify piping so as to not contact with each other or with external plate

2. Field Maintenance	Electrical Circuit													
Possible causes of trouble	Power Failure	Blown fuse or varistor	Loose connections	Shorted or broken wires	Safety device opens	Faulty thermostat/room temperature sensor	Wrong setting place of temperature sensor	Faulty transformer	Shorted or open capacitor	Faulty magnetic contactor for compressor	Faulty magnetic contactor for fan	Low voltage	Faulty stepping motor	Shorted or grounded compressor	Shorted or grounded fan motor
Unit will not start	√	√	√	√	√	X	X	√	X	X	X	X	X	X	X
Compressor will not start but fans run	X	X	X	√	X	√	X	√	√	X	X	X	X	√	X
Compressor and condenser fan will not start	X	X	X	√	X	√	X	X	X	√	X	X	X	X	X
Air handler fan will not start	X	X	X	√	X	X	X	X	√	X	√	X	X	X	√
Condenser fan will not start	X	X	X	√	X	√	X	X	√	X	√	X	X	X	√
Unit runs but shortly stops	X	X	X	X	X	X	X	X	X	√	X	√	X	X	X
Compressor short-cycles due to overload	X	X	X	X	X	X	X	X	X	√	X	√	X	X	X
High discharge pressure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Low discharge pressure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test method/ remedy	Test voltage	Inspect fuse type & size	Inspect connections - tighten	Test circuits with tester	Test continuity of safety device	Test continuity of thermostat/ sensor & wiring	Place the temperature sensor at the central of the air inlet grille	Check control circuit with tester	Check capacitor with tester	Test continuity of coil & contacts	Test continuity of coil & contacts	Test voltage	Replace the stepping motor	Check resistance with multimeter	Check resistance with multimeter

2. Field Maintenance	Electrical Circuit													
Possible causes of trouble	Power Failure	Blown fuse or varistor	Loose connections	Shorted or broken wires	Safety device opens	Faulty thermostat/room temperature sensor	Wrong setting place of temperature sensor	Faulty transformer	Shorted or open capacitor	Faulty magnetic contactor for compressor	Faulty magnetic contactor for fan	Low voltage	Faulty stepping motor	Shorted or grounded compressor	Shorted or grounded fan motor
High suction pressure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Low suction pressure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Unit runs continuously but insufficient cooling	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Too cool	X	X	X	X	X	X	√	√	X	X	X	X	X	X	X
Compressor is noisy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Horizontal louver can not revolve	X	X	√	√	X	X	X	X	X	X	X	X	√	X	X
Test method/ remedy	Test voltage	Inspect fuse type & size	Inspect connections - tighten	Test circuits with tester	Test continuity of safety device	Test continuity of thermostat/ sensor & wiring	Place the temperature sensor at the central of the air inlet grille	Check control circuit with tester	Check capacitor with tester	Test continuity of coil & contacts	Test continuity of coil & contacts	Test voltage	Replace the stepping motor	Check resistance with multimeter	Check resistance with multimeter

5.5 Quick Maintenance by Error Code

If you do not have the time to test which specific parts are faulty, you can change the required parts according to the error code. You can find the parts to replace by error code in the following table.

Part Requiring Replacement	Error Code										
	EH 00/ EH 0A	EL 01	EH 03	EH 60	EH 61	EH 62/ EH 66	EH 65	EL 0C	EH C1/ EH C2	EH 0E	EH 0b
Indoor PCB	√	√	√	√	√	√	√	√	x	√	√
Outdoor PCB	x	√	x	x	x	x	x	x	x	x	x
Indoor fan motor	x	x	√	x	x	x	x	x	x	x	x
T1 sensor	x	x	x	√	x	x	x	x	x	x	x
T2 sensor	x	x	x	x	√	x	x	√	x	√	x
T2B sensor	x	x	x	x	x	√	x	x	x	x	x
T2A sensor	x	x	x	x	x	x	√	x	x	x	x
Magnet ring	x	√	x	x	x	x	x	x	x	x	x
Compressor	x	x	x	x	x	x	x	x	x	x	x
Additional refrigerant	x	x	x	x	x	x	x	√	√	√	x
Water-level switch	x	x	x	x	x	x	x	x	x	√	x
Water pump	x	x	x	x	x	x	x	x	x	√	x
Display board	x	x	x	x	x	x	x	x	x	x	√

Part Requiring Replacement	Error Code											
	EC 54	EC 51	EC 52	EC 53	EC 56	EC 07	PC 00	PC 01	PC 02	PC 04	PC 03	FH CC/EH C3
Indoor PCB	X	X	X	X	X	X	X	X	X	X	X	√
Outdoor PCB	√	√	√	√	√	√	√	√	√	√	√	X
Outdoor fan motor	X	X	X	X	X	√	√	X	√	√	X	X
T3 sensor	X	X	√	X	X	X	X	X	X	X	X	X
T4 sensor	X	X	X	√	X	X	X	X	X	X	X	X
TP sensor	√	X	X	X	X	X	X	X	X	X	X	X
T2B sensor	X	X	X	X	√	X	X	X	X	X	X	X
Refrigerant sensor	X	X	X	X	X	X	X	X	X	X	X	√
Reactor sensor	X	X	X	X	X	X	X	√	X	X	X	X
Compressor	X	X	X	X	X	X	√	X	X	√	X	X
IPM module board	X	X	X	X	X	X	√	√	√	√	X	X
Pressure protector	X	X	X	X	X	X	X	X	X	X	√	X
Additional refrigerant	X	X	X	X	X	X	X	X	X	X	√	X

5.6 Troubleshooting by Error Code

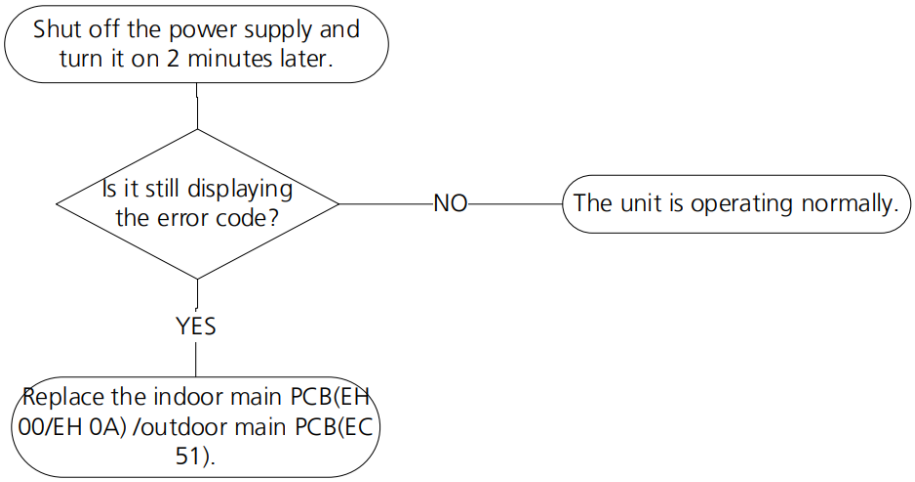
EH 00/ EH 0A/ EC 51: EEPROM malfunction error diagnosis and solution.

Description: Indoor or outdoor PCB main chip does not receive feedback from EEPROM chip.

Recommended parts to prepare:

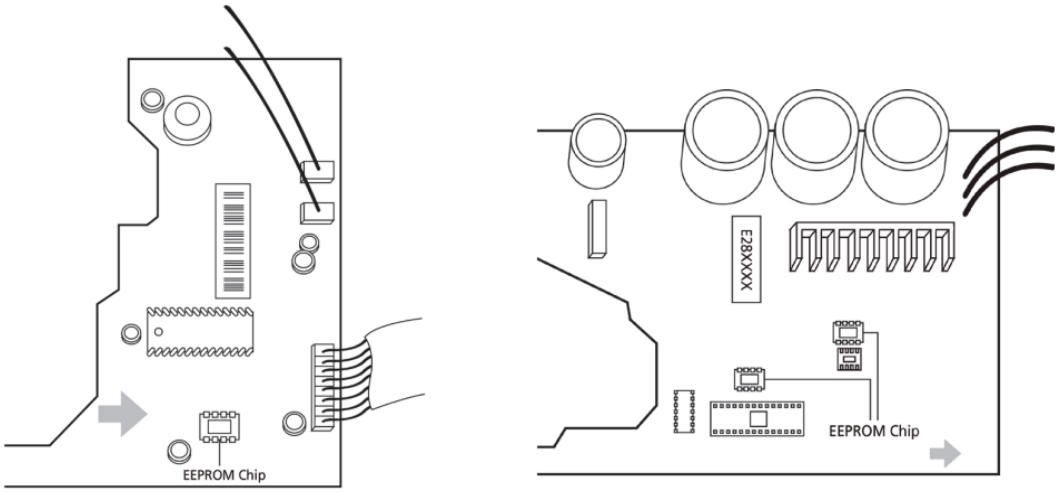
- Indoor PCB
- Outdoor PCB

Troubleshooting and repair:



Remarks:

EEPROM: A read-only memory whose contents can be erased and reprogrammed using a puled voltage. The location of the EEPROM chip on the indoor and outdoor PCB is shown in the following two images:



Note: These pictures are for reference, actual appearance may vary.

Troubleshooting and repair of the compressor driven chip EEPROM parameter error and communication error between the outdoor main chip and compressor driven chip are the same as EC 51.

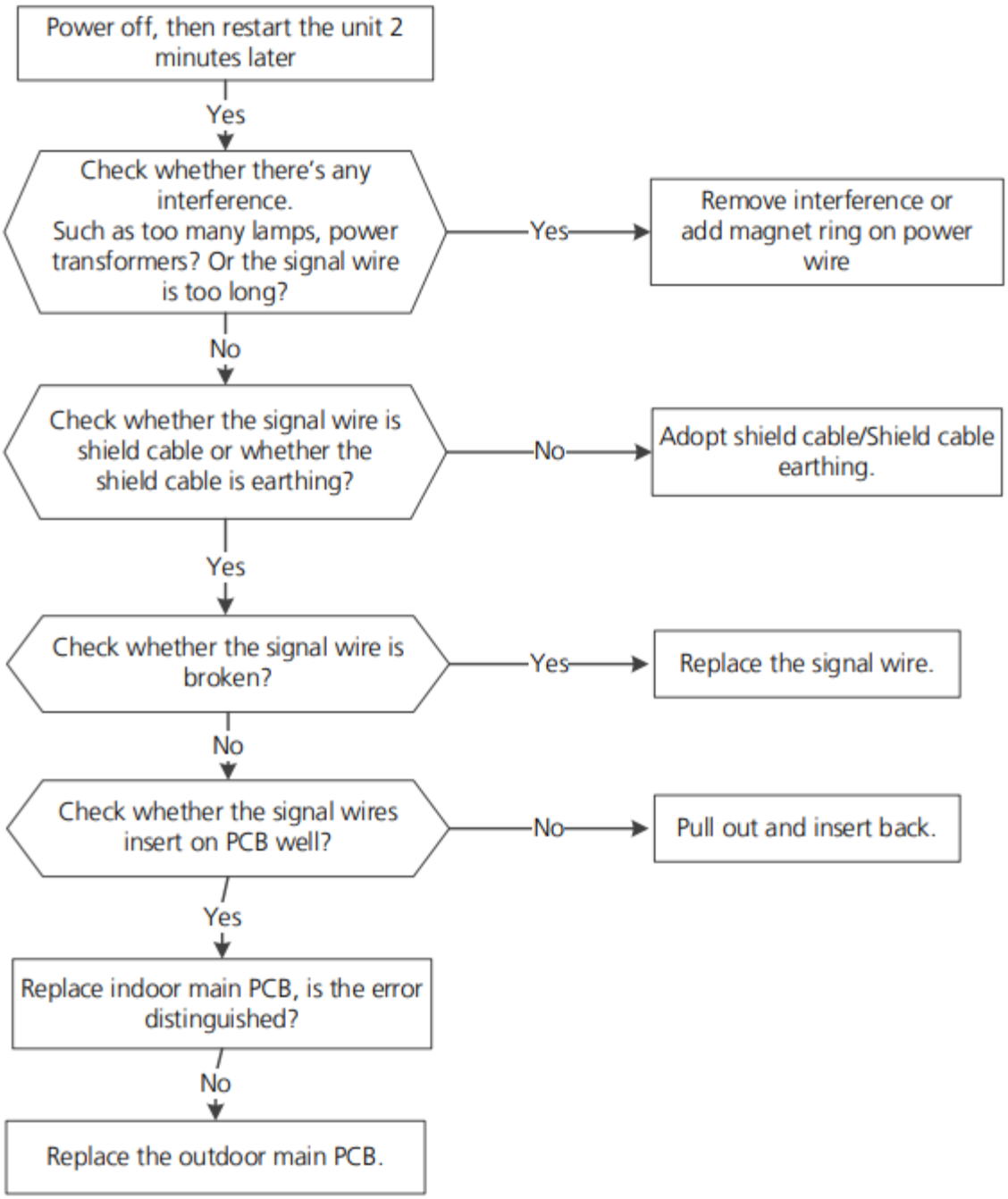
EL 01: Indoor and Outdoor unit communication error diagnosis and solution.

Description: Indoor unit cannot communicate with the outdoor unit.

Recommended parts to prepare:

- Indoor PCB
- Outdoor PCB
- Signal wires
- Magnet ring

Troubleshooting and repair:



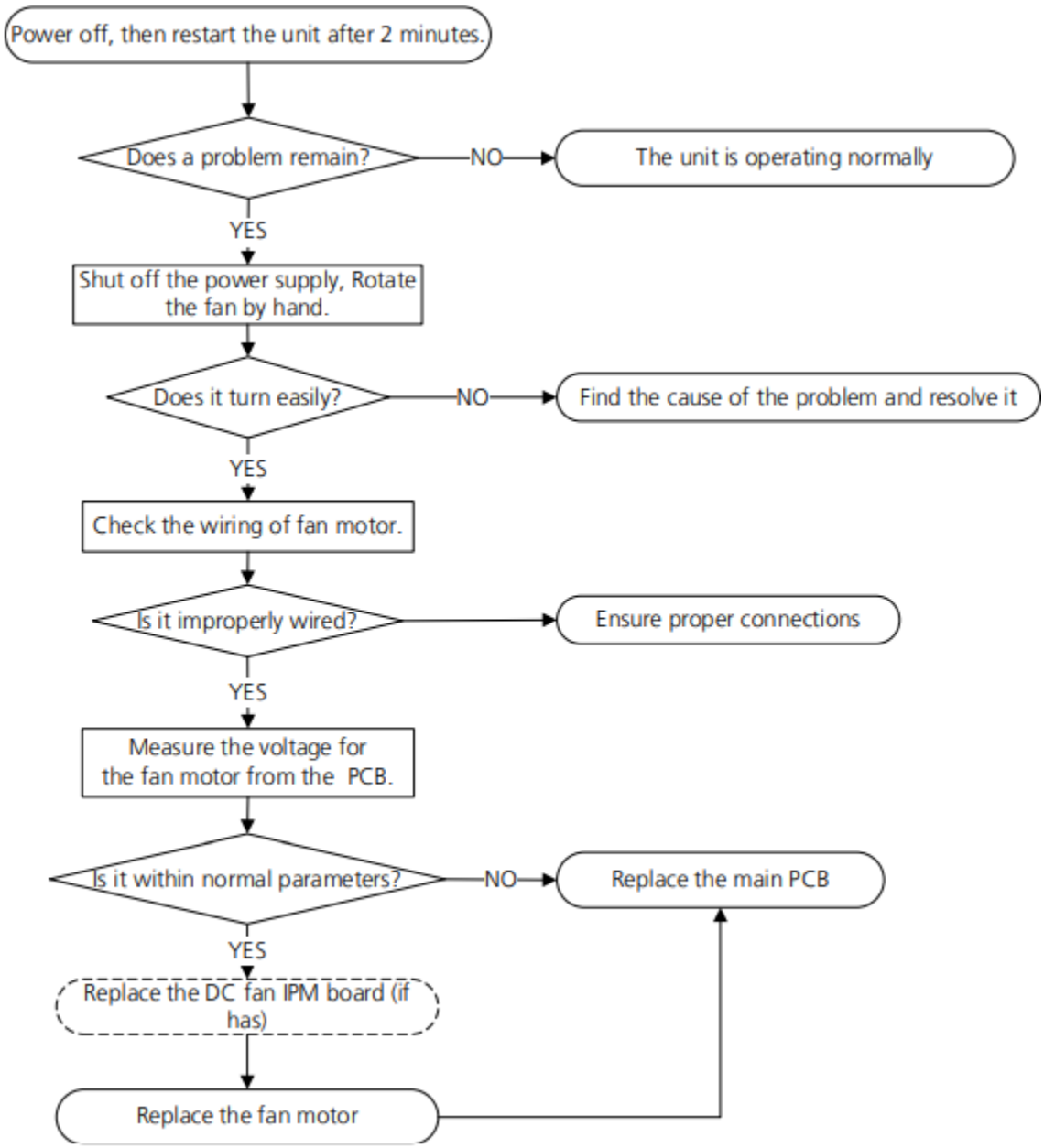
EH 03/ EC 07: Fan speed is operating outside of normal range diagnosis and solution.

Description: When the indoor/outdoor fan speed is too low or too high for a certain time, the unit ceases operation and the LED displays an error code.

Recommended parts to prepare:

- Connection wires
- Fan assembly
- Fan motor
- PCB

Troubleshooting and repair:

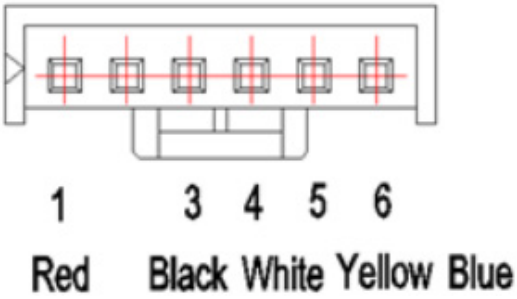


Index:

1. Indoor or Outdoor DC fan motor (control chip is in fan motor)

Power on and make sure the unit is in standby, measure the voltage of pin1-pin3, pin4-pin3 on the fan motor connector. If the value of the voltage is not in the range showing in the tables below the PCB will have problems and will need to be replaced.

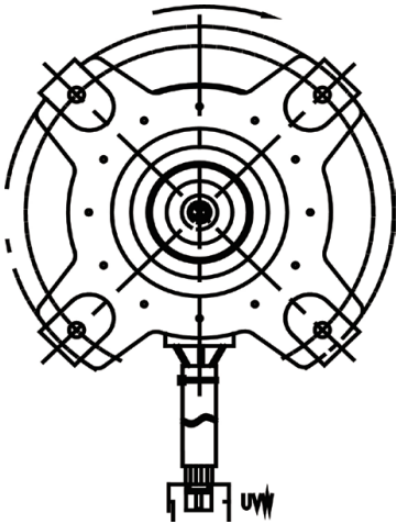
NO.	Color	Signal	Voltage
1	Red	Vs/Vm	192V~380V
2	---	---	---
3	Black	GND	0V
4	White	Vcc	13.5-16.5V
5	Yellow	Vsp	0~6.5V
6	Blue	FG	13.5-16.5V



Index:

1. Outdoor DC fan motor (control chip is in outdoor PCB)

Release the UVW connector and measure the resistance of U-V, U-W, V-W. If the resistance is not equal to each other the fan motor has a problem and needs to be replaced. Otherwise the PCB has a problem and needs to be replaced.



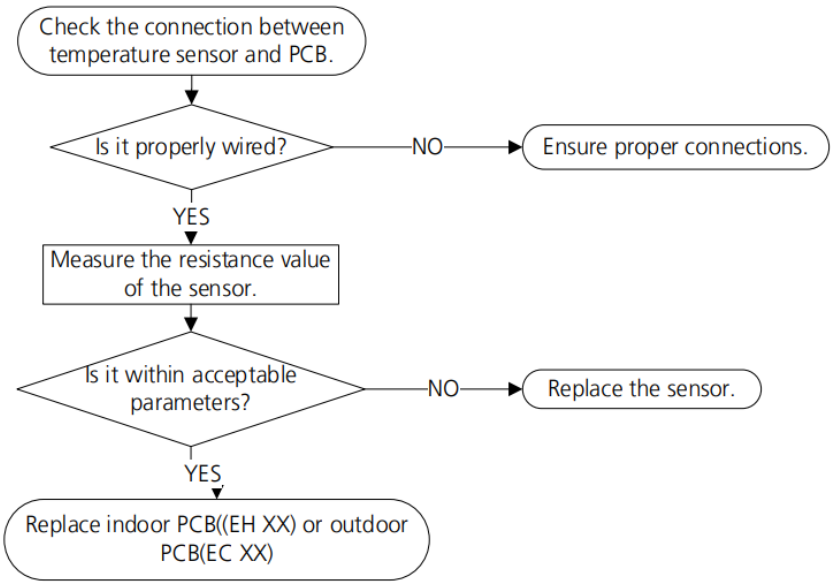
EH 60/ EH 61/ EH 62/ EH 66/ EH 65/ EC 53/ EC 52/ EC 54/ EC 56: Open circuit or short circuit of temperature sensor diagnosis and solution.

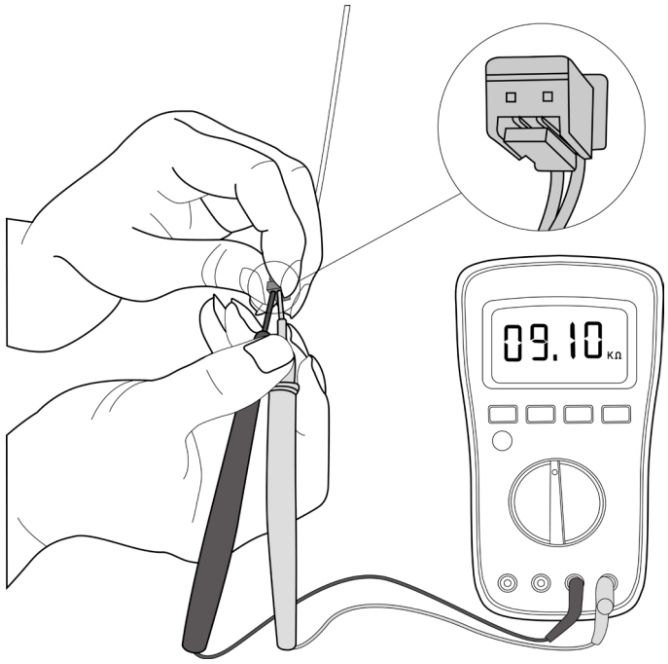
Description: If the sampling voltage is lower than 0.06V or higher than 4.94V the LED will display an error.

Recommended parts to prepare:

- Connection wires
- Sensors
- PCB

Troubleshooting and repair:





Note: The picture and the value are for reference only, actual appearance and values may vary.

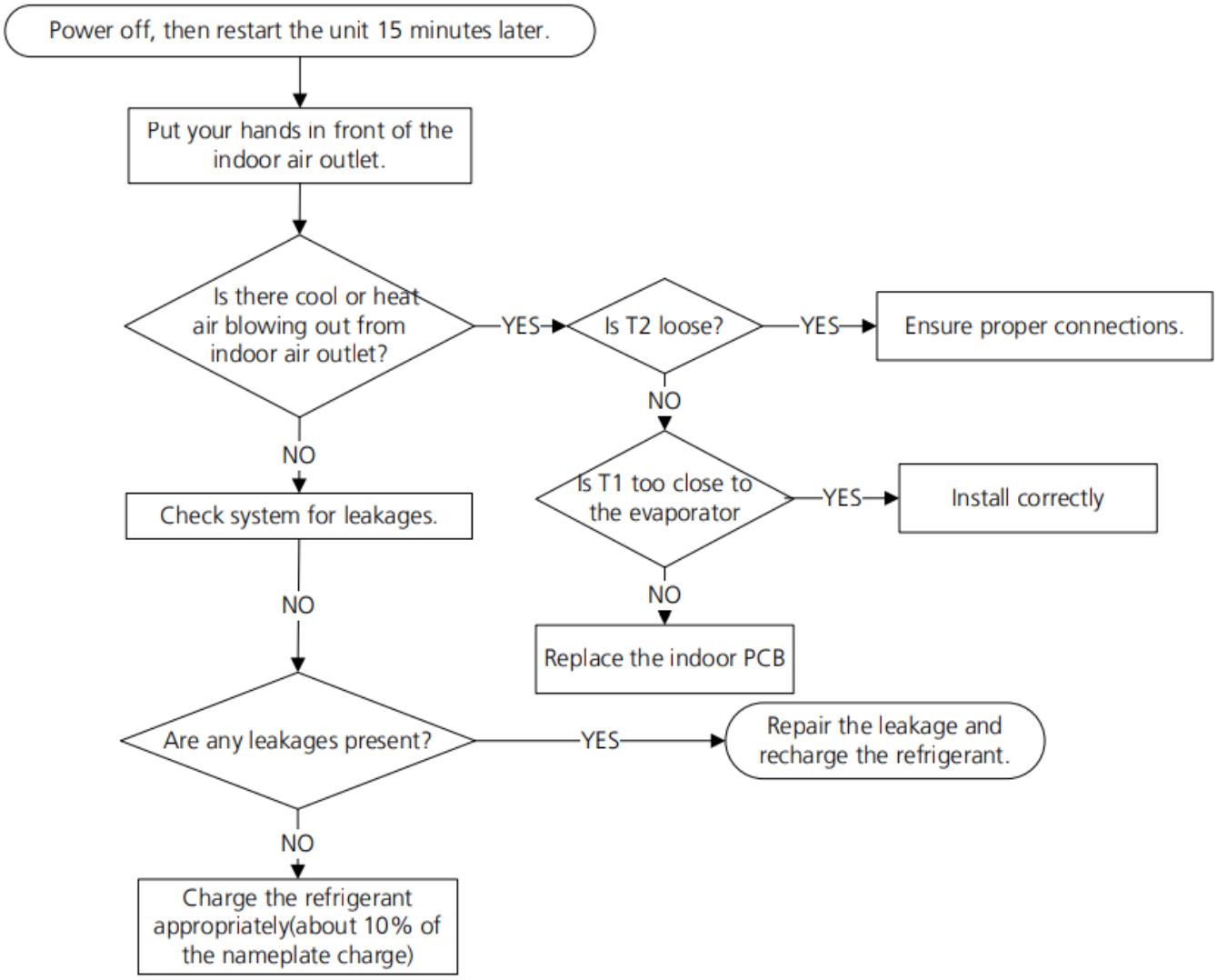
EL 0C: System lacks refrigerant diagnosis and solution.

Description: Judging the abnormality of the refrigeration system according to the number of compressor stops and the changes in operating parameters caused by excessive exhaust temperature.

Recommended parts to prepare:

- Indoor PCB
- Additional refrigerant

Troubleshooting and repair:



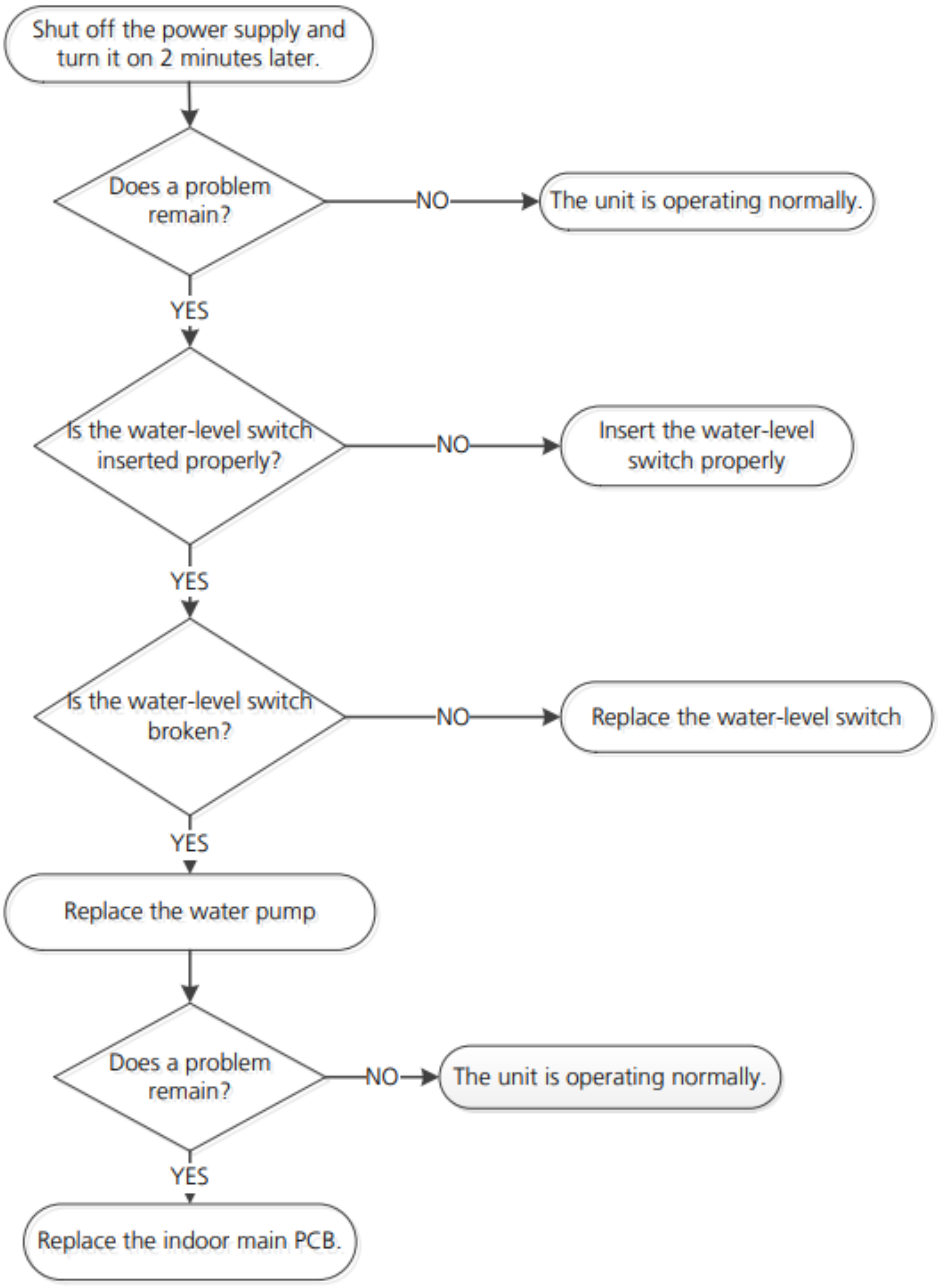
EH 0E: Water-level alarm malfunction diagnosis and solution

Description: If the sampling voltage is not 5V the LED displays an error code.

Recommended parts to prepare:

- Connection wires
- Water-level switch
- Water pump
- Indoor PCB

Troubleshooting and repair:



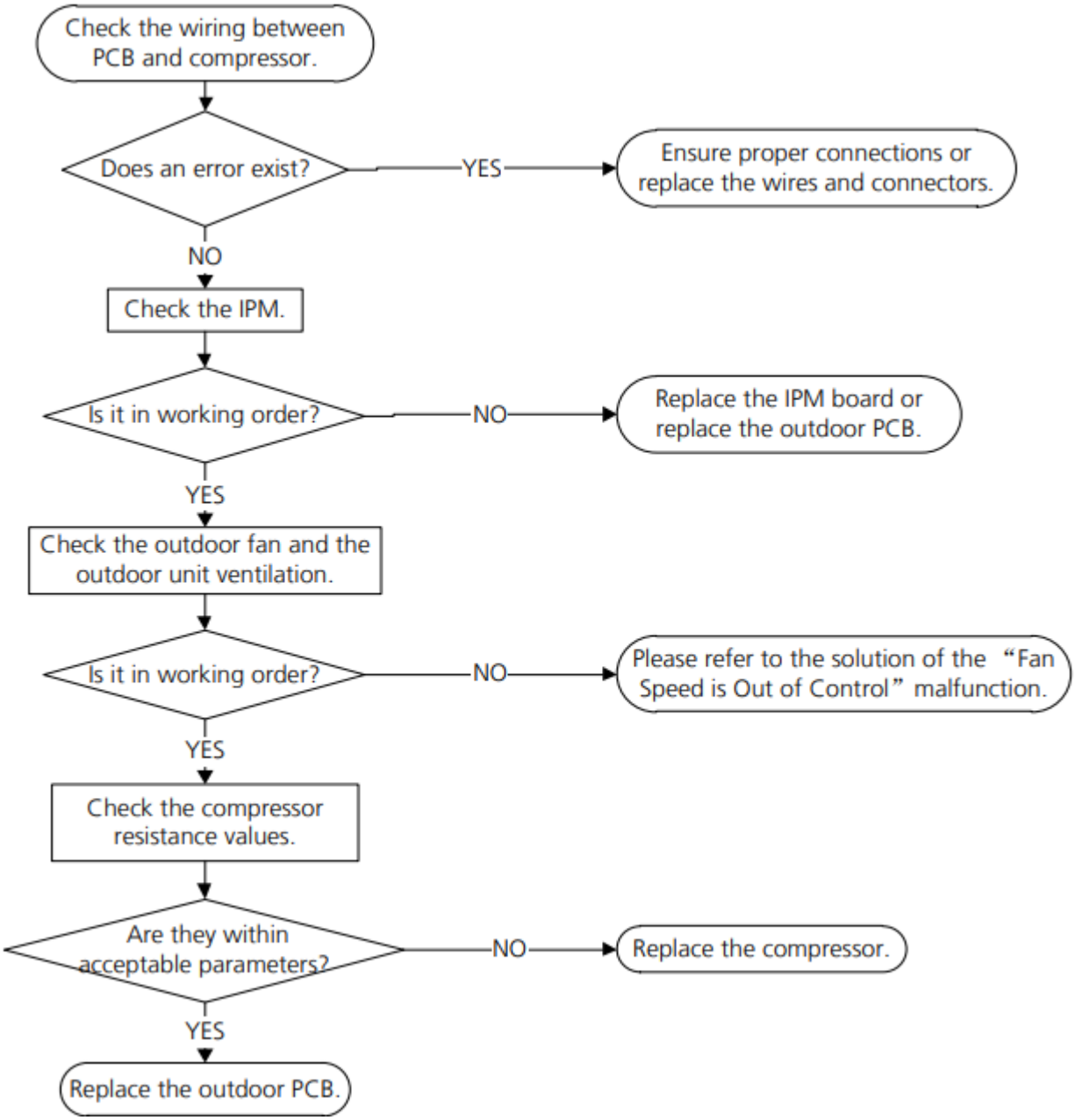
PC 00: ODU IPM module protection diagnosis and solution.

Description: When the voltage signal the IPM sends to the compressor drive chip is abnormal the LED display shows "PC 00" and the system shuts down.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



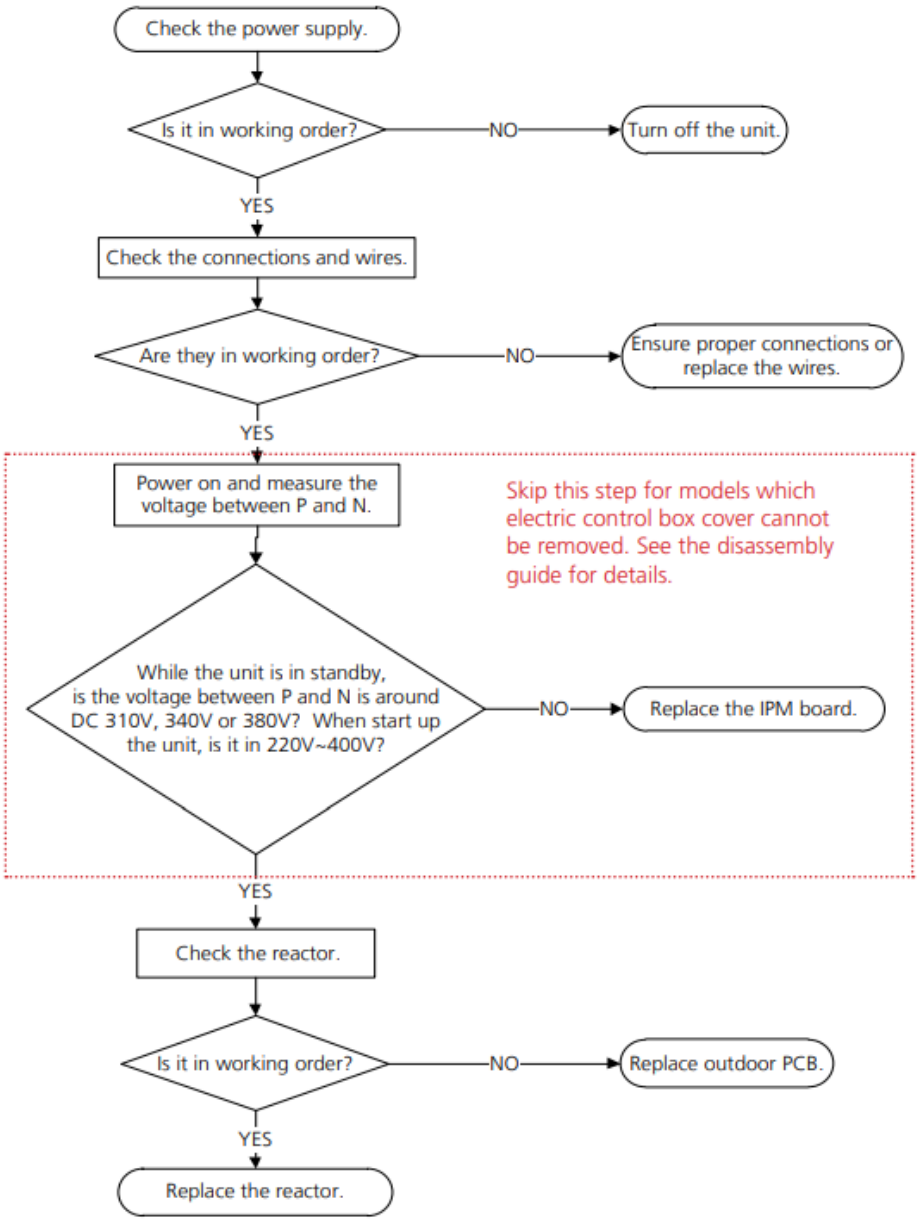
PC 01: ODU voltage protection diagnosis and solution.

Description: Abnormal increases or decreases in voltage are detected by checking the specified voltage detection circuit.

Recommended parts to prepare:

- Power supply wires
- IPM module board
- PCB
- Reactor

Troubleshooting and repair:



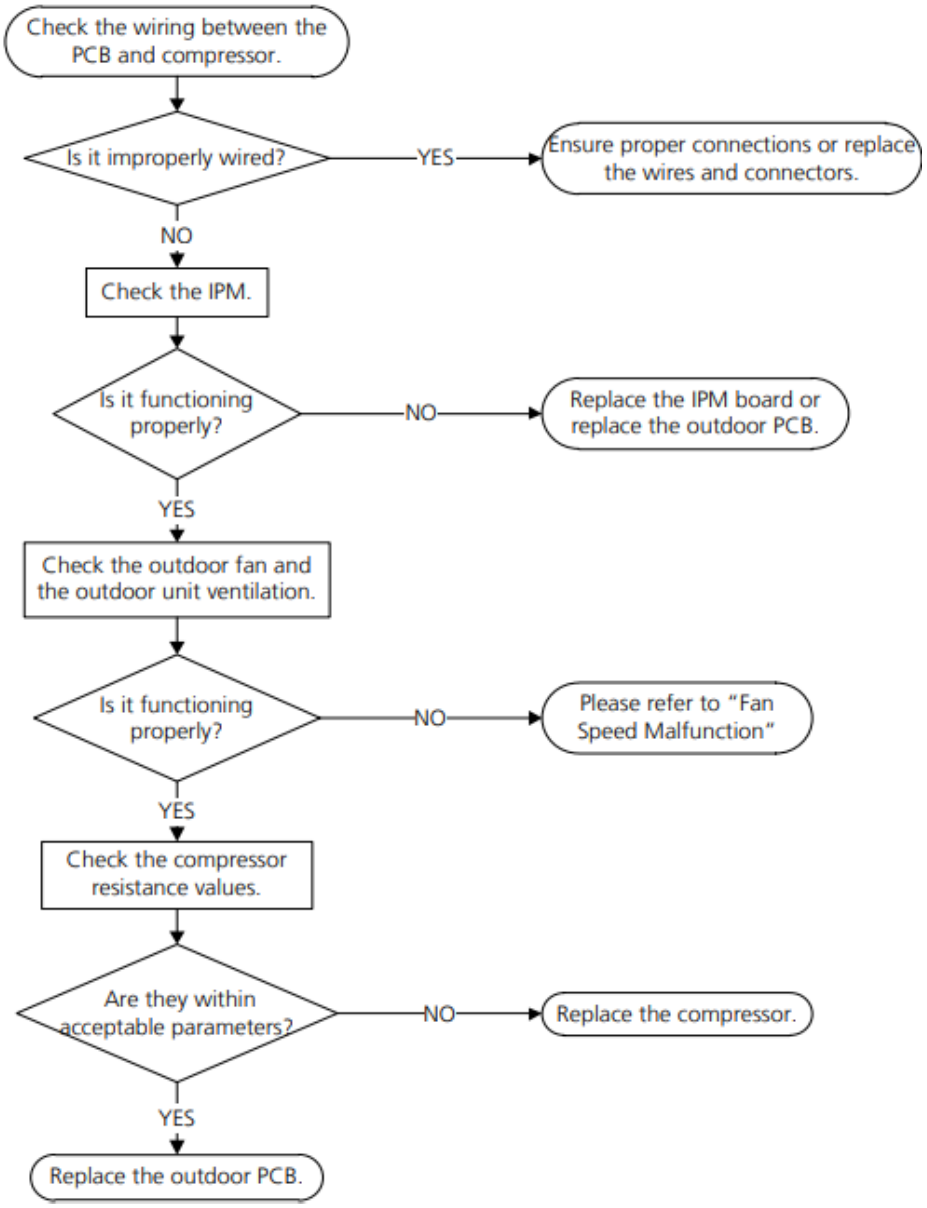
PC 04: Inverter compressor drive error diagnosis and solution.

Description: An abnormal inverter compressor drive is detected by a special detection circuit, including communication signal detection, voltage detection, compressor rotation speed signal detection and so on.

Recommended parts to prepare:

- Connection wires
- IPM module board
- Outdoor fan assembly
- Compressor
- Outdoor PCB

Troubleshooting and repair:



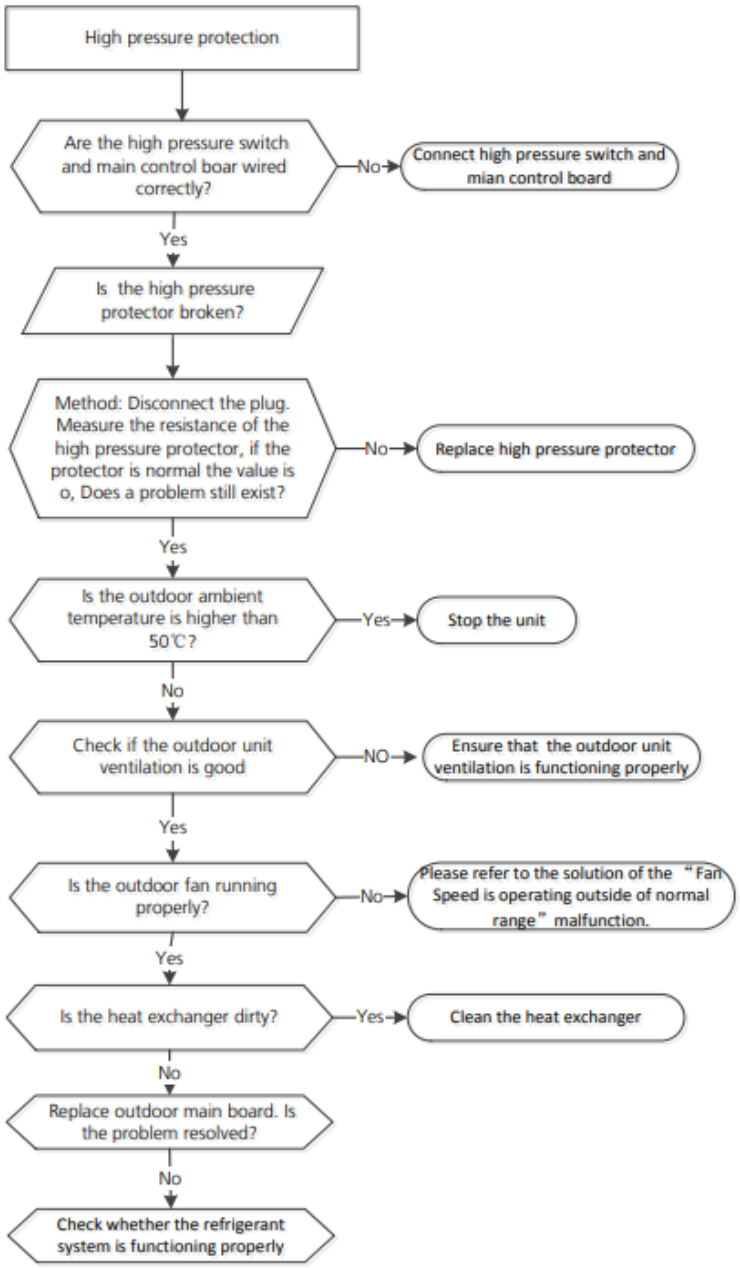
PC 03: Pressure protection (low or high pressure) diagnosis and solution.

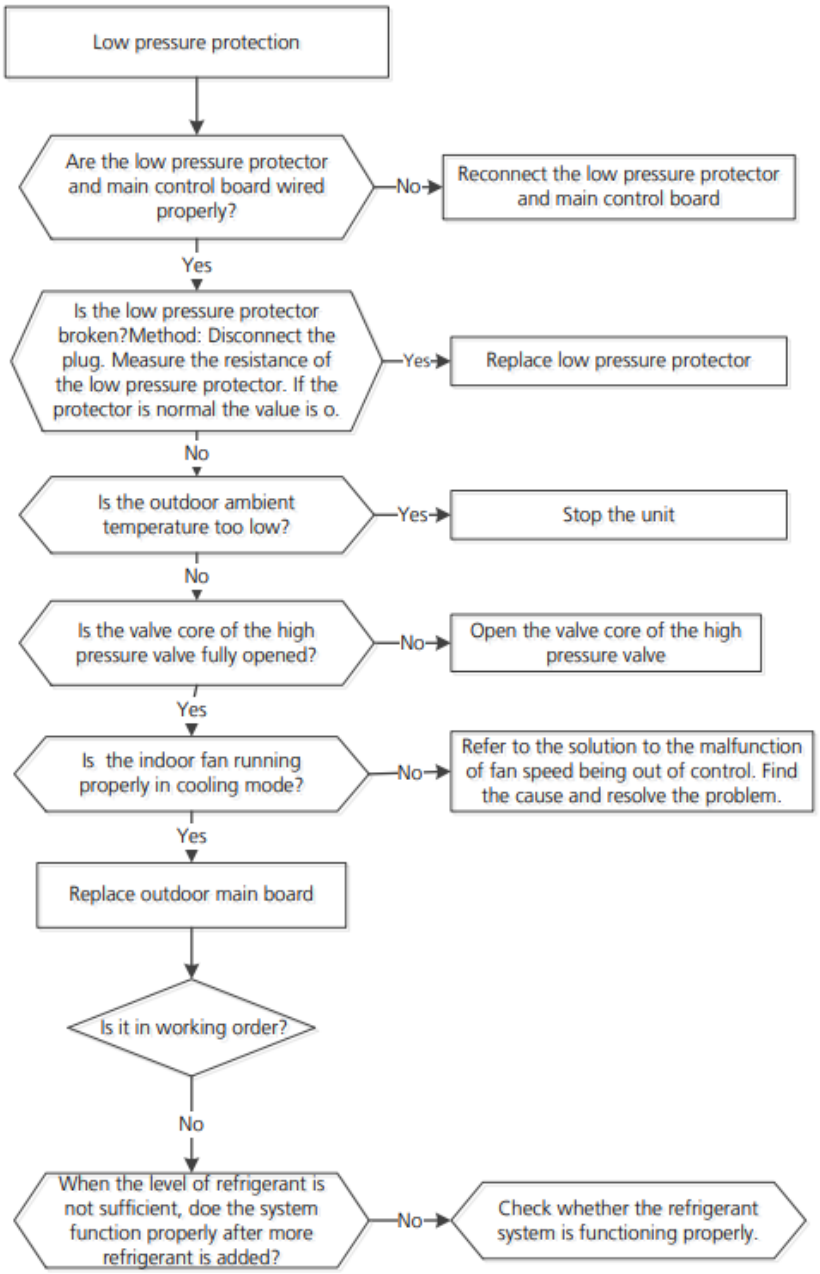
Description: Outdoor pressure switch cuts off the system because pressure is higher than 638PSI (4.4MPa) or the outdoor pressure switch cuts off because pressure is lower than 19PSI (0.13MPa) the LED displays an error code.

Recommended parts to prepare:

- Connection wires
- Pressure switch
- Outdoor fan
- Outdoor main PCB
- Refrigerant

Troubleshooting and repair:




Low pressure protection
Are the low pressure protector and main control board wired properly?
No
Reconnect the low pressure protector and main control board
Yes
Is the low pressure protector broken?Method: Disconnect the plug. Measure the resistance of the low pressure protector. If the protector is normal the value is o.
Yes
Replace low pressure protector
No
Is the outdoor ambient temperature too low?
Yes
Stop the unit
No
Is the valve core of the high pressure valve fully opened?
No
Open the valve core of the high pressure valve
Yes
Is the indoor fan running properly in cooling mode?
No
Refer to the solution to the malfunction of fan speed being out of control. Find the cause and resolve the problem.
Yes
Replace outdoor main board
Is it in working order?
No
When the level of refrigerant is not sufficient, doe the system function properly after more refrigerant is added?
No
Check whether the refrigerant system is functioning properly.

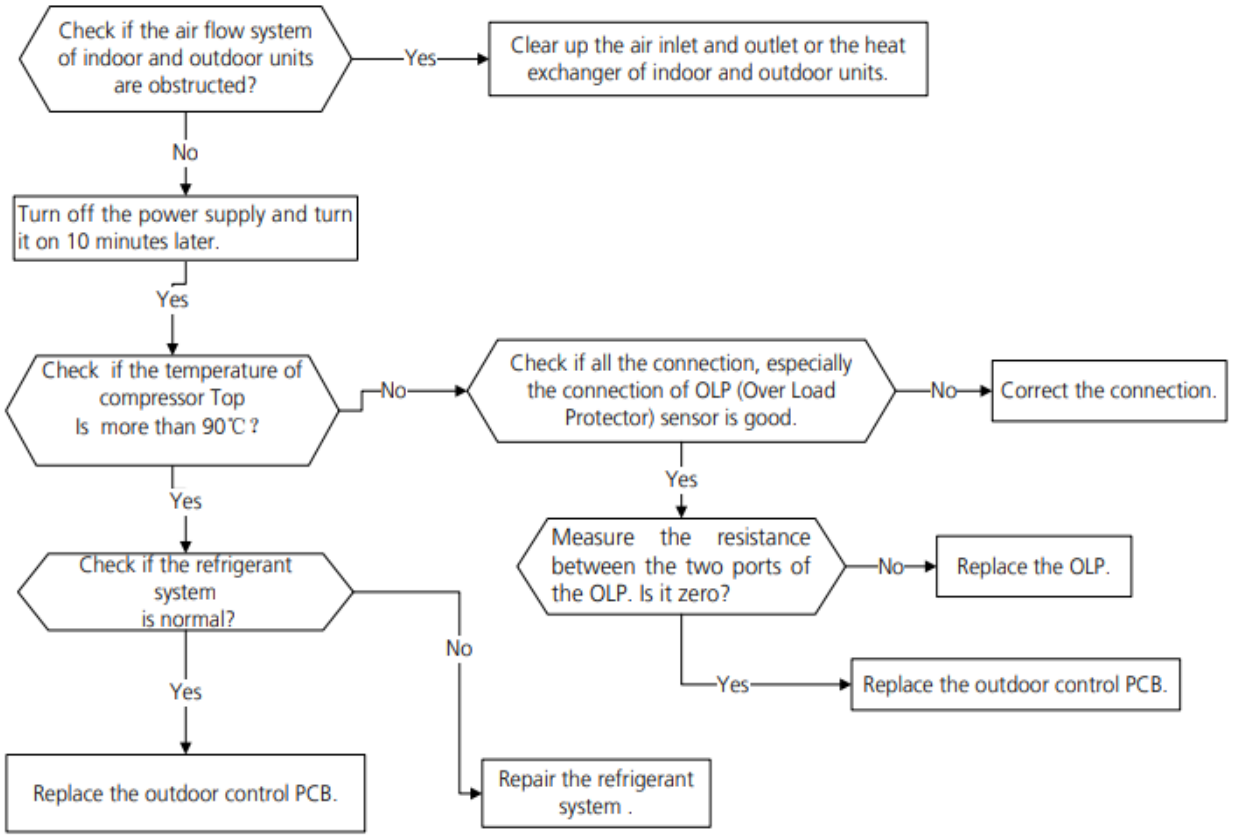
PC 02: Compressor top (or IPM) temp. protection diagnosis and solution.

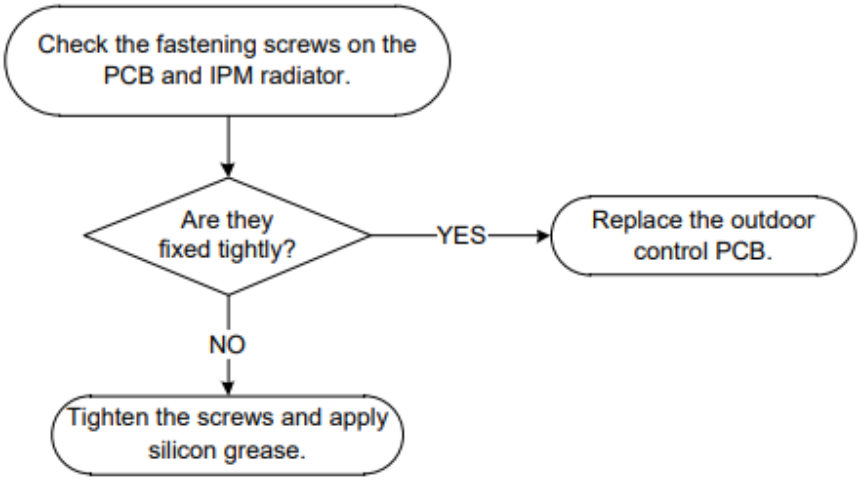
Description: For some models with an overload protection, if the sampling voltage is not 5V the LED will display an error. If the temperature of the IPM module is higher than a certain value the LED will display an error. Models without an overload protector should be diagnosed according to the second flowchart.

Recommended parts to prepare:

- Connection wires
- Outdoor PCB
- IPM module board
- High pressure protector
- System blockages

Troubleshooting and repair:





PC 0L: Low ambient temperature protection.

Description: It is a protection function for the system (when off) that occurs when the outdoor ambient temperature (T4) is lower than -35°C for 10s which will cause the system to stop and display an error code.
When the compressor is on and the outdoor ambient temperature is lower than -40°C for 10s, the system will stop and display an error code.
When the outdoor ambient temperature (T4) is no lower than -32°C for 10s the unit will exit the protection.

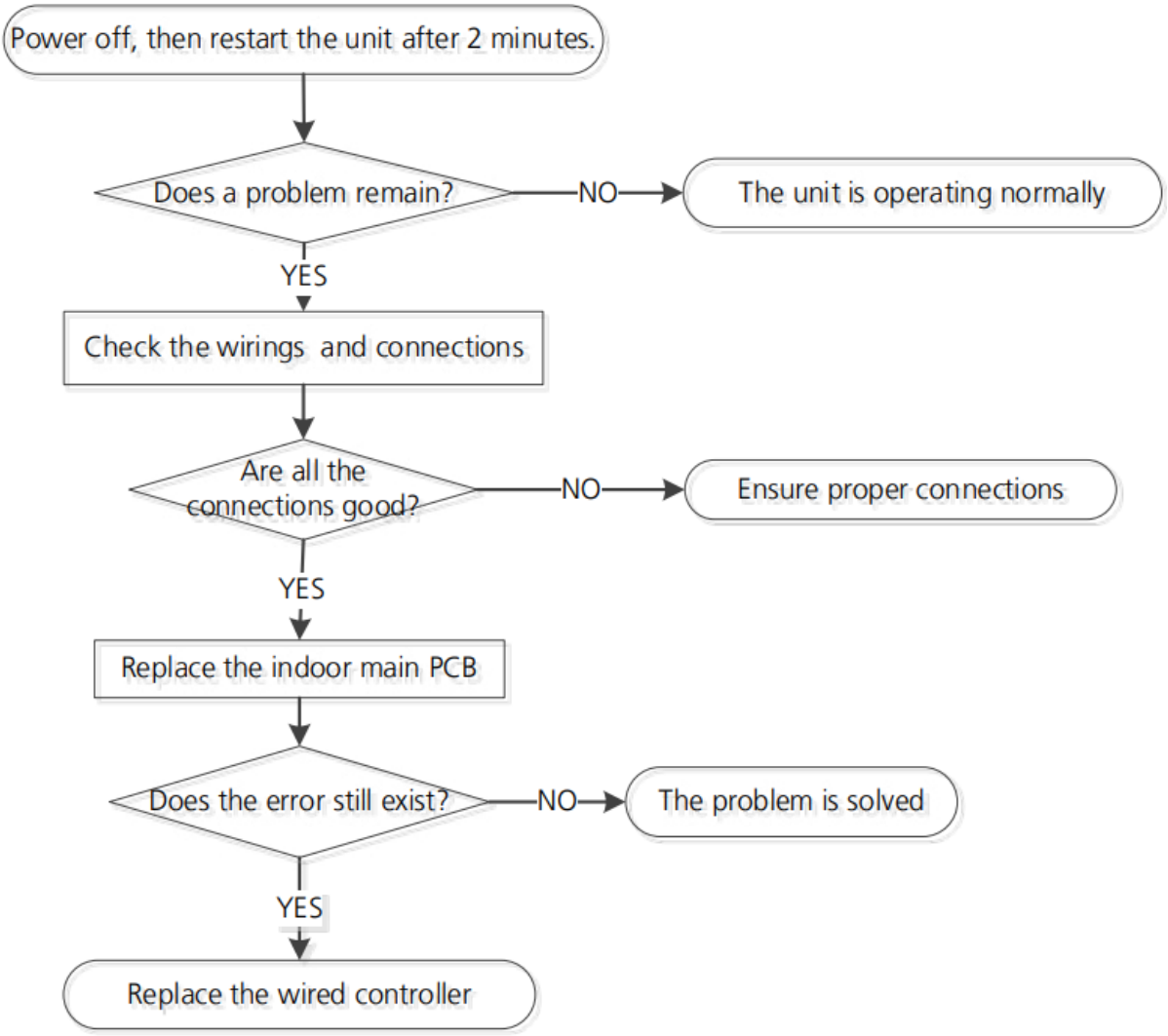
EH b3: Communication malfunction between wire and master control diagnosis and solution.

Description: If the indoor PCB does not receive feedback from the wired controller the error will display on the wired controller.

Recommended parts to prepare:

- Connection wires
- Indoor PCB
- Wired controller

Troubleshooting and repair:



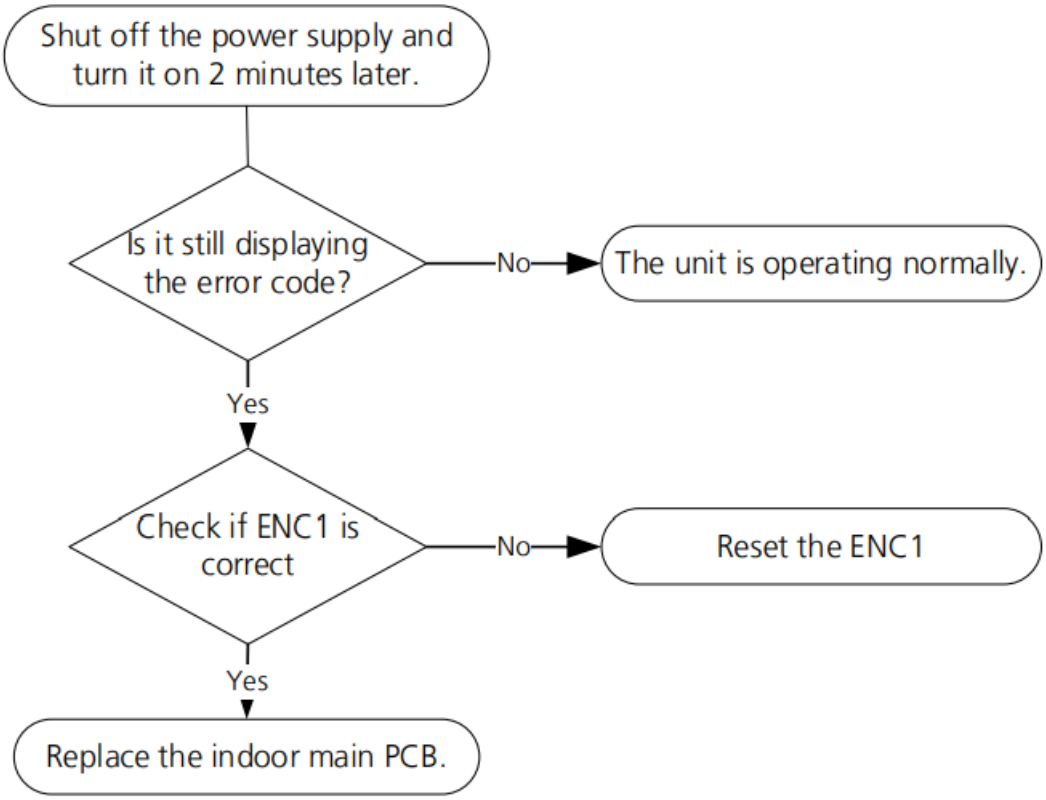
EH bA: Communication malfunction between indoor unit and external fan module. EH 3A: External fan DC bus voltage is too low protection. EH 3b: External fan DC bus voltage is too high diagnosis and solution.

Description: Indoor unit does not receive the feedback from external fan module during 150 seconds or the indoor unit receives abnormal increases or decreases in voltage from external fan module.

Recommended parts to prepare:

- Indoor PCB

Troubleshooting and repair:



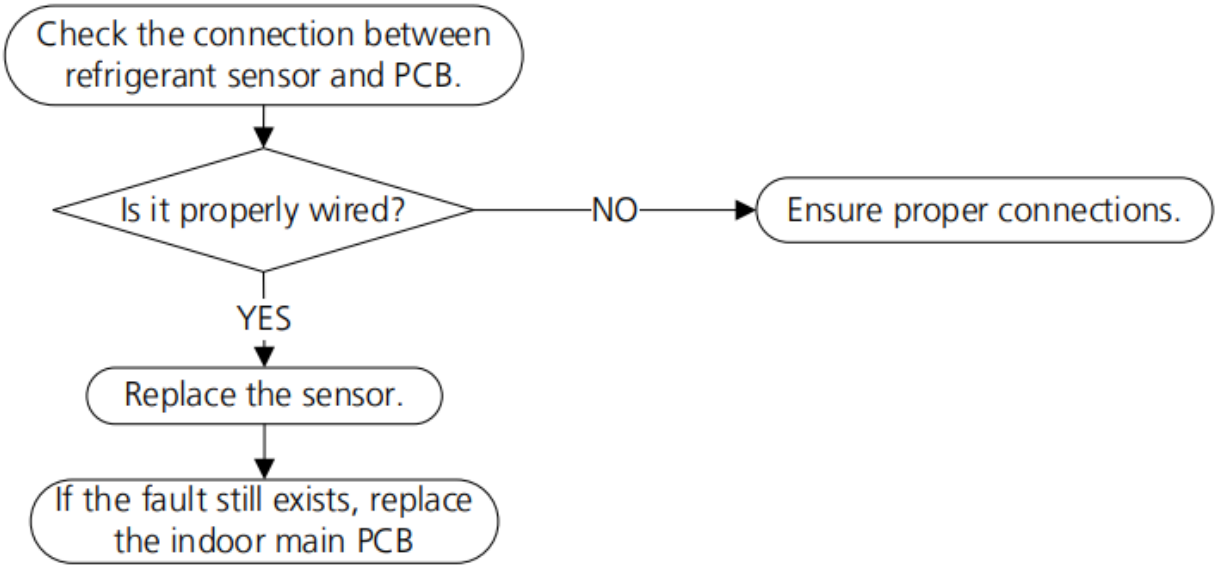
FH CC: Refrigerant sensor error or EH C3: Refrigerant sensor is out of range diagnosis and solution.

Description: Indoor unit receives a fault signal for 10s or the indoor unit does not receive feedback from the refrigerant sensor for 150s.

Recommended parts to prepare:

- Connection wires
- Sensors
- Indoor main PCB

Troubleshooting and repair:



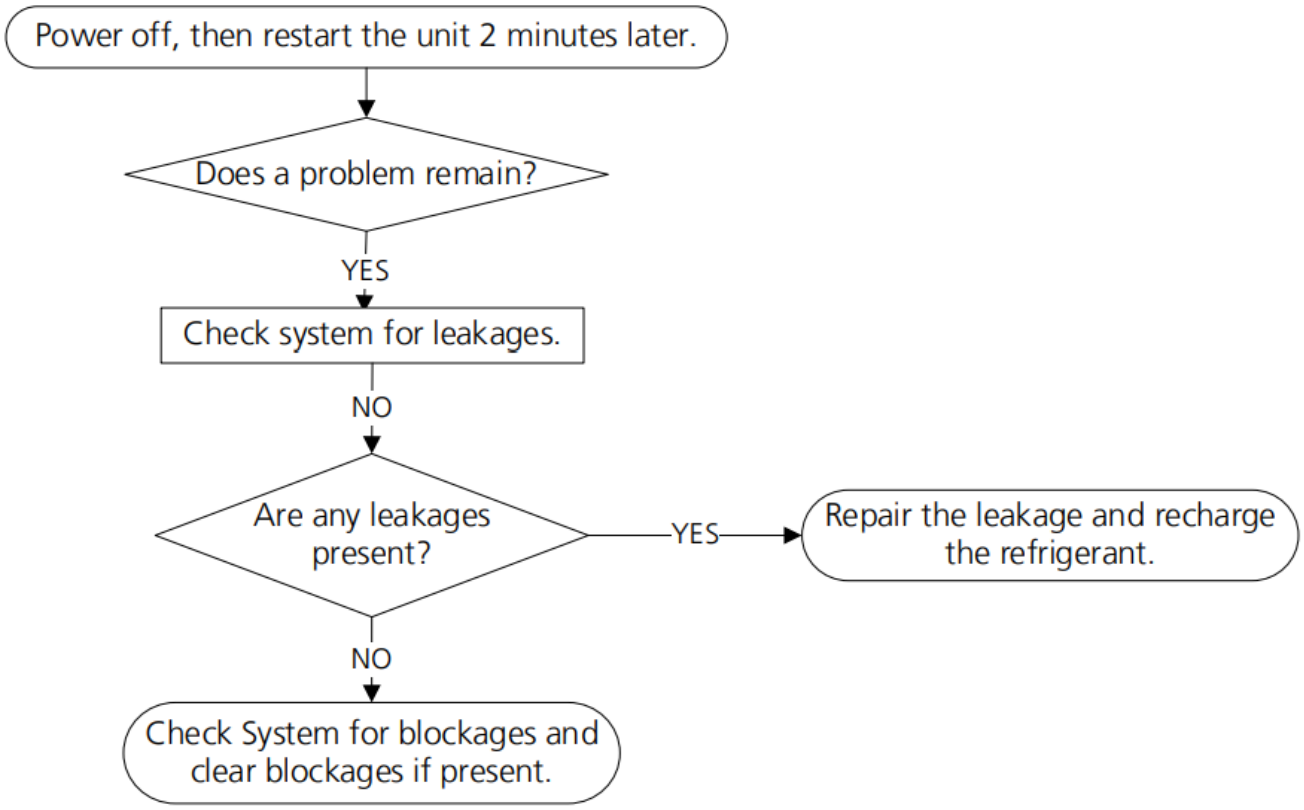
EH C1: Refrigerant sensor detect leakage or EH C2: Refrigerant sensor is out of range and leakage is detected diagnosis and solution.

Description: The refrigerant sensor detects a concentration higher than or equal to 10%*LFL for 10 seconds or the refrigerant sensor detects a concentration higher than or equal to 20%*LFL or the multi model receives the refrigerant leakage protection fault sent by the outdoor unit.
Multi-zone: Only the buzzer of the indoor unit that detects refrigerant leakage continues to sound the alarm, the shortest sound is 10 seconds, and the longest sound is 5 minutes (you can press any key such as remote control or wire control, app, and so on to eliminate the alarm), and the other non-refrigerant leakage fault the indoor unit only displays "ECC1" but the buzzer does not sound.

Recommended parts to prepare:

- Additional refrigerant

Troubleshooting and repair:



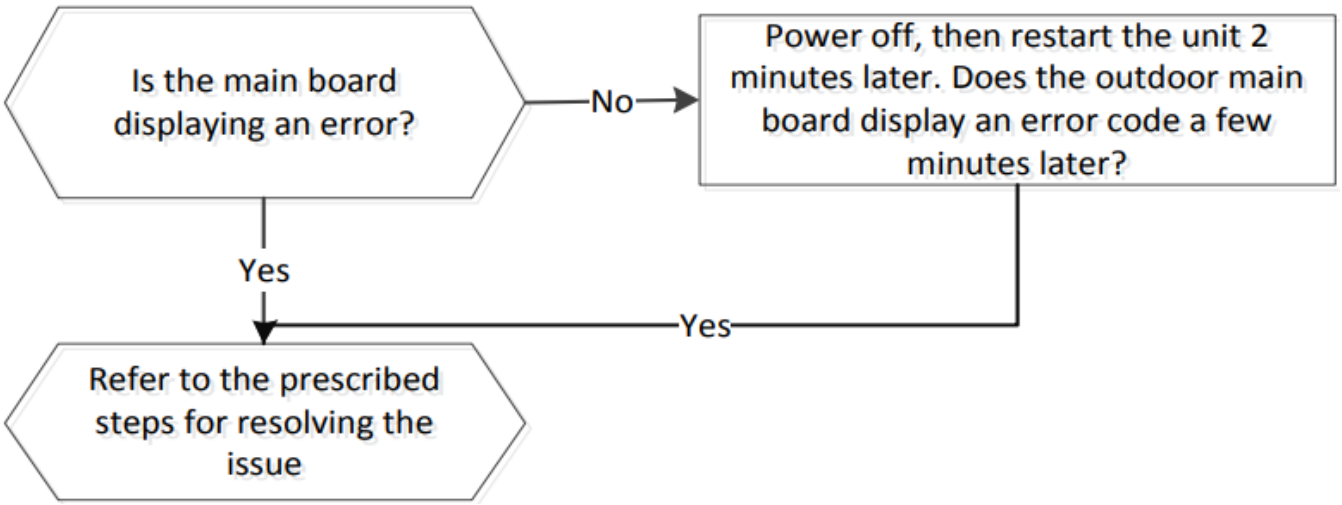
EC 0d: ODU malfunction diagnosis and solution.

Description: The indoor unit detects the outdoor unit has an error.

Recommended parts to prepare:

- Outdoor unit

Troubleshooting and repair:



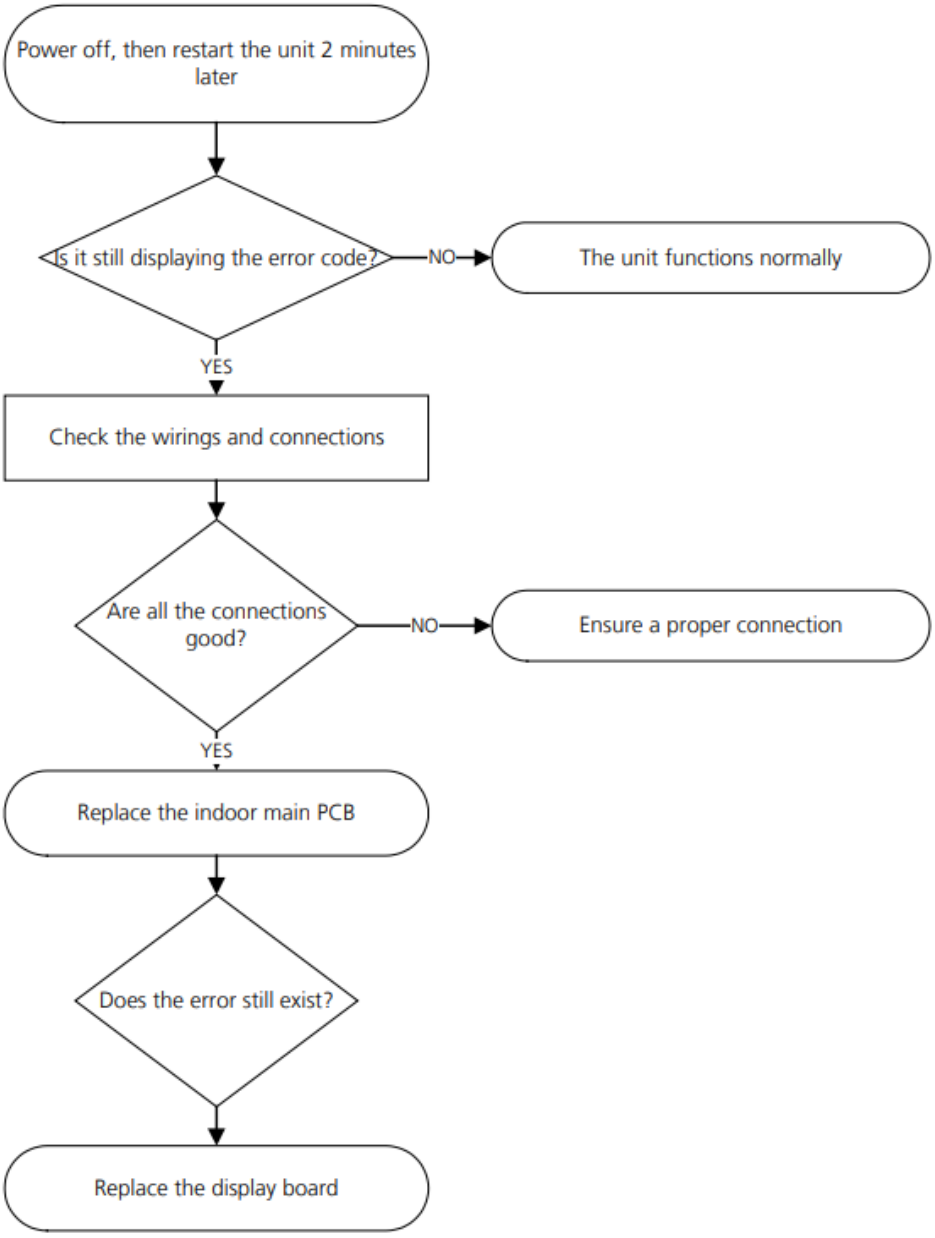
EH 0b: IDU main control board and display board communication error diagnosis and solution.

Description: Indoor PCB does not receive feedback from the display board.

Recommended parts to prepare:

- Communication wire
- Indoor PCB
- Display board

Troubleshooting and repair:



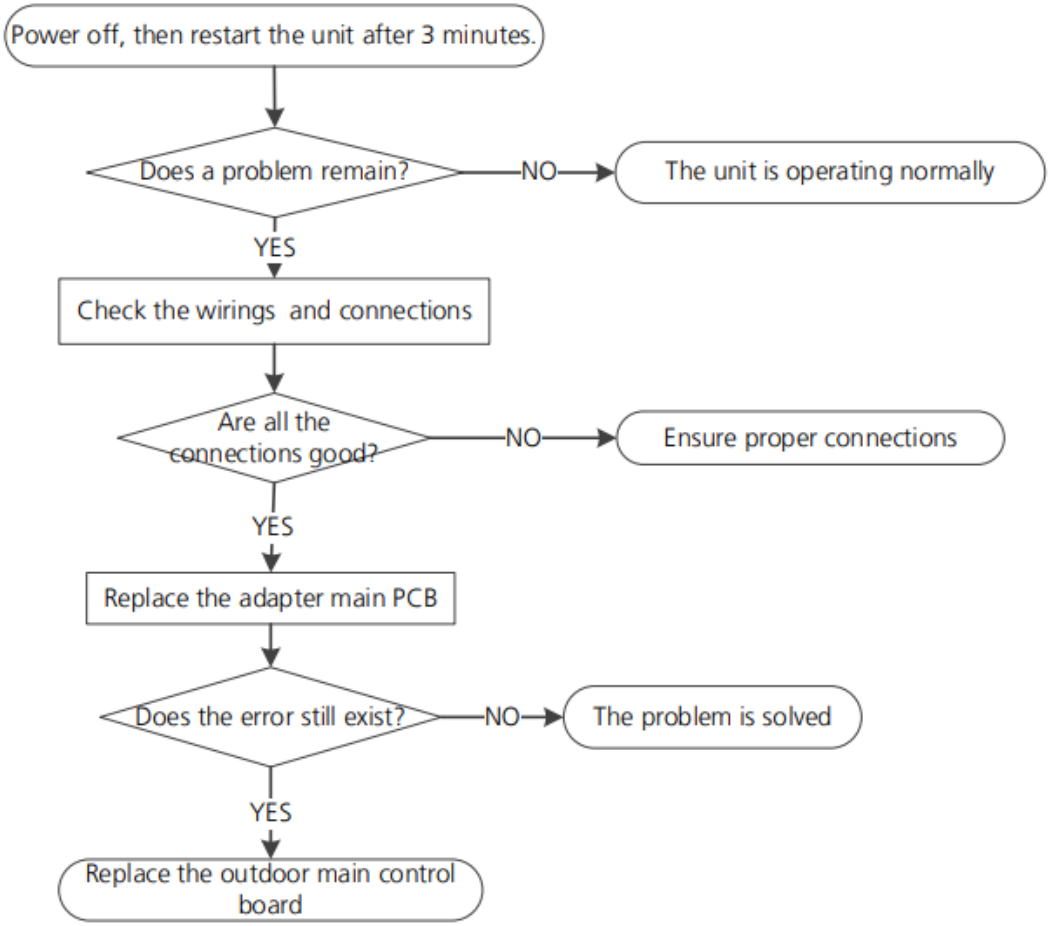
EL 16: Communication malfunction between adapter board and outdoor main board diagnosis and solution.

Description: The adapter PCB cannot detect the main control board.

Recommended parts to prepare:

- Connection wires
- Adapter board
- Outdoor main PCB

Troubleshooting and repair:



FL 09: Mismatch between the new and old platforms diagnosis and solution.

Description: When the indoor and outdoor units are mismatched the LED will display this code. Please replace the indoor or outdoor unit to match accordingly.

4.7 Check Procedures

WARNING

Be sure to turn off all power supplies or disconnect all wires to avoid electric shock. Operate only after the compressor and coil has returned to normal temperature in case of injury.

Temperature Sensor Check:

1. Disconnect the temperature sensor from the PCB.
2. Measure the resistance value of the sensor using a multi-meter.
3. Check corresponding temperature sensor resistance value table.

Note: The picture and the value are for reference only, actual condition and specific values may vary.

Temperature Sensor Resistance Value Table for TP (°C-K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	542.7	20	68	68.66	60	140	13.59	100	212	3.702
-19	-2	511.9	21	70	65.62	61	142	13.11	101	214	3.595
-18	0	483	22	72	62.73	62	144	12.65	102	216	3.492
-17	1	455.9	23	73	59.98	63	145	12.21	103	217	3.392
-16	3	430.5	24	75	57.37	64	147	11.79	104	219	3.296
-15	5	406.7	25	77	54.89	65	149	11.38	105	221	3.203
-14	7	384.3	26	79	52.53	66	151	10.99	106	223	3.113
-13	9	363.3	27	81	50.28	67	153	10.61	107	225	3.025
-12	10	343.6	28	82	48.14	68	154	10.25	108	226	2.941
-11	12	325.1	29	84	46.11	69	156	9.902	109	228	2.86
-10	14	307.7	30	86	44.17	70	158	9.569	110	230	2.781
-9	16	291.3	31	88	42.33	71	160	9.248	111	232	2.704
-8	18	275.9	32	90	40.57	72	162	8.94	112	234	2.63
-7	19	261.4	33	91	38.89	73	163	8.643	113	235	2.559
-6	21	247.8	34	93	37.3	74	165	8.358	114	237	2.489
-5	23	234.9	35	95	35.78	75	167	8.084	115	239	2.422
-4	25	222.8	36	97	34.32	76	169	7.82	116	241	2.357
-3	27	211.4	37	99	32.94	77	171	7.566	117	243	2.294
-2	28	200.7	38	100	31.62	78	172	7.321	118	244	2.233
-1	30	190.5	39	102	30.36	79	174	7.086	119	246	2.174
0	32	180.9	40	104	29.15	80	176	6.859	120	248	2.117
1	34	171.9	41	106	28	81	178	6.641	121	250	2.061
2	36	163.3	42	108	26.9	82	180	6.43	122	252	2.007
3	37	155.2	43	109	25.86	83	181	6.228	123	253	1.955
4	39	147.6	44	111	24.85	84	183	6.033	124	255	1.905
5	41	140.4	45	113	23.89	85	185	5.844	125	257	1.856
6	43	133.5	46	115	22.89	86	187	5.663	126	259	1.808
7	45	127.1	47	117	22.1	87	189	5.488	127	261	1.762
8	46	121	48	118	21.26	88	190	5.32	128	262	1.171
9	48	115.2	49	120	20.46	89	192	5.157	129	264	1.674
10	50	109.8	50	122	19.69	90	194	5	130	266	1.632
11	52	104.6	51	124	18.96	91	196	4.849			
12	54	99.69	52	126	18.26	92	198	4.703			
13	55	95.05	53	127	17.58	93	199	4.562			
14	57	90.66	54	129	16.94	94	201	4.426			
15	59	86.49	55	131	16.32	95	203	4.294			
16	61	82.54	56	133	15.73	96	205	4.167			
17	63	78.79	57	135	15.16	97	207	4.045			
18	64	75.24	58	136	14.62	98	208	3.927			
19	66	71.86	59	138	14.09	99	210	3.812			

Other Temperature Sensor Resistance Value Table (°C-K)

°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm	°C	°F	K Ohm
-20	-4	115.266	20	68	12.6431	60	140	2.35774	100	212	0.62973
-19	-2	108.146	21	70	12.0561	61	142	2.27249	101	214	0.61148
-18	0	101.517	22	72	11.5	62	144	2.19073	102	216	0.59386
-17	1	96.3423	23	73	10.9731	63	145	2.11241	103	217	0.57683
-16	3	89.5865	24	75	10.4736	64	147	2.03732	104	219	0.56038
-15	5	84.219	25	77	10	65	149	1.96532	105	221	0.54448
-14	7	79.311	26	79	9.55074	66	151	1.89627	106	223	0.52912
-13	9	74.536	27	81	9.12445	67	153	1.89627	107	225	0.51426
-12	10	70.1698	28	82	8.71983	68	154	1.83003	108	226	0.49989
-11	12	66.0898	29	84	8.3356	69	156	1.76647	109	228	0.486
-10	14	62.2756	30	86	7.97078	70	158	1.70547	110	230	0.47256
-9	16	58.7079	31	88	7.62411	71	160	1.64691	111	232	0.45957
-8	18	56.3694	32	90	7.29464	72	162	1.59068	112	234	0.44699
-7	19	52.2438	33	91	6.98142	73	163	1.53668	113	235	0.43482
-6	21	49.3161	34	93	6.68355	74	165	1.48481	114	237	0.42304
-5	23	46.5725	35	95	6.40021	75	167	1.43498	115	239	0.41164
-4	25	44	36	97	6.13059	76	169	1.38703	116	241	0.4006
-3	27	41.5878	37	99	5.87359	77	171	1.34105	117	243	0.38991
-2	28	39.8239	38	100	5.62961	78	172	1.29078	118	244	0.37956
-1	30	37.1988	39	102	5.3689	79	174	1.25423	119	246	0.36954
0	32	35.2024	40	104	5.17519	80	176	1.2133	120	248	0.35982
1	34	33.3269	41	106	4.96392	81	178	1.17393	121	250	0.35042
2	36	31.5635	42	108	4.76253	82	180	1.13604	122	252	0.3413
3	37	29.9058	43	109	4.5705	83	181	1.09958	123	253	0.33246
4	39	28.3459	44	111	4.38736	84	183	1.06448	124	255	0.3239
5	41	26.8778	45	113	4.21263	85	185	1.03069	125	257	0.31559
6	43	25.4954	46	115	4.04589	86	187	0.99815	126	259	0.30754
7	45	24.1932	47	117	3.88673	87	189	0.96681	127	261	0.29974
8	46	22.5662	48	118	3.73476	88	190	0.93662	128	262	0.29216
9	48	21.8094	49	120	3.58962	89	192	0.90753	129	264	0.28482
10	50	20.7184	50	122	3.45097	90	194	0.8795	130	266	0.2777
11	52	19.6891	51	124	3.31847	91	196	0.85248	131	268	0.27078
12	54	18.7177	52	126	3.19183	92	198	0.82643	132	270	0.26408
13	55	17.8005	53	127	3.07075	93	199	0.80132	133	271	0.25757
14	57	16.9341	54	129	2.95896	94	201	0.77709	134	273	0.25125
15	59	16.1156	55	131	2.84421	95	203	0.7537	135	275	0.24512
16	61	15.3418	56	133	2.73823	96	205	0.73119	136	277	0.23916
17	63	14.6181	57	135	2.63682	97	207	0.68844	137	279	0.23338
18	64	13.918	58	136	2.53973	98	208	0.66818	138	280	0.22776
19	66	13.2631	59	138	2.4467	99	210	0.64862	139	282	0.22231

System Pressure Table-R454B

Pressure			Temperature		Pressure			Temperature	
Kpa	Bar	PSI	°C	°F	Kpa	Bar	PSI	°C	°F
58.196	0.58	8.44	-60	-76	935.23	9.35	135.64	8	46.4
61.517	0.62	8.92	-59	-74.2	963.75	9.64	139.78	9	48.2
64.988	0.65	9.43	-58	-72.4	992.93	9.93	14401	10	50
68.615	0.69	9.95	-57	-70.6	1022.8	10.23	148.34	11	51.8
72.402	.072	10.50	-56	-68.8	1053.3	10.53	152.76	12	53.6
76.354	0.76	11.07	-55	-67	1084.5	10.85	157.29	13	55.4
80.478	0.80	11.67	-54	-65.2	1116.4	11.16	161.91	14	57.2
84.776	0.85	12.30	-53	-63.4	1149	11.49	166.64	15	59
89.256	0.89	12.95	-52	-61.6	1182.3	11.82	171.47	16	60.8
93.923	0.94	13.62	-51	-59.8	1216.3	12.16	176.40	17	62.6
98.781	0.99	14.33	-50	-58	1251.1	12.51	181.45	18	64.4
103.84	1.04	15.06	-49	-56.2	1286.6	12.87	186.60	19	66.2
109.1	1.09	15.82	-48	-54.4	1322.8	13.23	191.85	20	68
114.56	1.15	16.61	-47	-52.6	1359.9	13.60	197.23	21	69.8
120.25	1.20	17.44	-46	-50.8	1397.7	13.98	202.71	22	71.6
126.15	1.26	18.30	-45	-49	1436.3	14.36	208.31	23	73.4
132.28	1.32	19.18	-44	-47.2	1475.7	14.76	214.02	24	75.2
138.64	1.39	20.11	-43	-45.4	1515.9	15.16	219.85	25	77
145.24	1.45	21.06	-42	-43.6	1557	15.57	225.82	26	78.8
152.09	1.52	22.06	-41	-41.8	1598.9	15.99	231.89	27	80.6
159.18	1.59	23.09	-40	-40	1641.6	16.42	238.09	28	82.4
166.54	1.67	24.15	-39	-38.2	1685.2	16.85	244.41	29	84.2
174.15	1.74	25.26	-38	-36.4	1729.7	17.30	250.86	30	86
182.04	1.82	26.40	-37	-34.6	1775	17.75	257.43	31	87.8
190.2	1.90	27.59	-36	-32.8	1821.3	18.21	264.15	32	89.6
198.65	1.99	28.81	-35	-31	1868.4	18.68	270.98	33	91.4
207.39	2.07	30.08	-34	-29.2	1916.5	19.17	277.95	34	93.2
216.42	2.16	31.39	-33	-27.4	1965.6	19.66	285.08	35	95
225.76	2.26	32.74	-32	-25.6	2015.5	20.16	292.31	36	96.8
235.41	2.35	34.14	-31	-23.8	2066.5	20.67	299.71	37	98.6
245.37	2.45	35.59	-30	-22	2118.4	21.18	307.24	38	100.4
255.67	2.56	37.08	-29	-20.2	2171.3	21.71	314.19	39	102.2
266.29	2.66	38.62	-28	-18.4	2225.2	22.25	322.73	40	104
277.25	2.77	40.21	-27	-16.6	2280.2	22.80	330.70	41	105.8
288.56	2.89	41.85	-26	-14.8	2336.1	23.36	38.81	42	107.6
300.22	3.00	43.54	-25	-13	2393.2	23.93	347.09	43	109.4
312.24	3.12	45.28	-24	-11.2	2451.3	24.51	355.52	44	111.2
324.63	3.25	47.08	-23	-9.4	2510.4	25.10	364.09	45	113
337.39	3.37	48.93	-22	-7.6	2570.7	25.71	372.84	46	114.8
350.54	3.51	50.84	-21	-5.8	2632.1	26.32	381.74	47	116.6
364.08	3.64	52.80	-20	-4	2694.7	26.95	390.82	48	118.4
378.02	3.78	54.83	-19	-2.2	2758.33	27.58	400.04	49	120.2
392.37	3.92	56.91	-18	-0.4	2823.2	28.23	409.46	50	122
407.13	4.07	59.05	-17	1.4	2889.3	28.89	419.04	51	123.8

System Pressure Table-R454B Cont.

Pressure			Temperature		Pressure			Temperature	
Kpa	Bar	PSI	°C	°F	Kpa	Bar	PSI	°C	°F
422.31	4.22	61.25	-16	3.2	2956.5	29.57	428.79	52	125.6
437.92	4.38	63.5	-15	5	3025	30.25	438.72	53	127.4
453.98	4.54	65.84	-14	6.8	3094.7	30.95	448.83	54	129.2
470.47	4.70	68.23	-13	8.6	3165.7	31.66	459.13	55	131
487.43	4.87	70.69	-12	10.4	3238.1	32.38	469.63	56	132.8
504.84	5.05	73.22	-11	12.2	3311.7	33.12	480.30	57	134.6
522.73	5.23	75.81	-10	14	3386.7	33.87	491.18	58	136.4
541.1	5.41	78.48	-9	15.8	3463	34.63	502.25	59	138.2
559.95	5.60	81.21	-8	17.6	3540.7	35.41	513.52	60	140
579.31	5.79	84.02	-7	19.4	3619.9	36.20	525.00	61	141.8
599.16	5.99	86.90	-6	21.2	3700.5	37.01	536.69	62	143.6
619.54	6.20	89.85	-5	23	3782.7	37.83	548.61	63	145.4
640.43	6.40	92.88	-4	24.8	3866.3	38.66	560.74	64	147.2
661.86	6.62	95.99	-3	26.6	3951.5	39.52	573.10	65	149
683.82	6.84	99.18	-2	28.4	4038.3	40.38	585.69	66	450.28
706.34	7.06	102.44	-1	30.2	4126.8	41.27	598.52	67	152.6
729.41	7.29	105.79	0	32	4217	42.17	611.60	68	154.4
753.06	7.53	109.22	1	33.8	4309	43.09	624.95	69	156.2
777.28	7.77	112.73	2	35.6	4402.9	44.03	638.56	70	158
802.08	8.02	116.33	3	37.4	4498.7	44.99	652.46	71	159.8
827.47	8.27	120.01	4	39.2	4596.5	45.97	666.64	72	161.6
853.49	8.53	123.78	5	41	4696.5	46.97	681.15	73	163.4
880.11	8.80	127.64	6	42.8	4798.9	47.99	696.00	74	165.5
907.35	9.07	131.60	7	44.6	4904.1	49.04	711.25	75	167

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