OWNER'S MANUAL

CASED COIL

MODEL NUMBER:

QVEE24

QVEE36

QVEE48

QVEE60



R32

To Users

Thank you for selecting Quebec Vair product. Please read this instruction manual carefully before installing and using the product, so as to master and correctly use the product. In order to guide you to correctly install and use our product and achieve expected operating effect, we hereby instruct as below:

(1) This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

(2) In order to ensure reliability of product, the product may consume some power under stand-by status for maintaining normal communication of system and preheating refrigerant and lubricant. If the product is not to be used for long, cut off the power supply; please energize and preheat the unit in advance before reusing it.

(3) Please properly select the model according to actual using environment, otherwise it may impact the using convenience.

(4) This product can't be installed at corrosive, inflammable or explosive environment or the place with special requirements, such as kitchen. Otherwise, it will affect the normal operation or shorten the service life of the unit, or even cause fire hazard or serious injury. As for above special places, please adopt special air conditioner with anti-corrosive or anti-explosion function.

(5) If the product needs to be installed, moved or maintained, please contact our designated dealer or local service center for professional support. Users should not disassemble or maintain the unit by themselves, otherwise it may cause relative damage, and our company will bear no responsibilities.

(6) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. If there is adjustment in the product, please subject to actual product.

Exception Clauses

Manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons:

(1) Damage the product due to improper use or misuse of the product.

(2) Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer.

(3) After verification, the defect of product is directly caused by corrosive gas.

(4) After verification, defects are due to improper operation during transportation of product.

(5) Operate, repair, maintain the unit without abiding by instruction manual or related regulations.

(6) After verification, the problem or dispute is caused by the quality specification or performance of parts and components that produced by other manufacturers.

(7) The damage is caused by natural calamities, bad using environment or force majeure.

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1 Safety Precautions

⚠WARNING

This product can't be installed at corrosive, inflammable or explosive environment or the place with special requirements, such as kitchen. Otherwise, it will affect the normal operation or shorten the service life of the unit, or even cause fire hazard or serious injury. As for above special places, please adopt special air conditioner with anti-corrosive or anti-explosion function.

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory--authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing. Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements. Recognize safety information. This is the safety--alert symbol ⚠.

Assure that PARTIAL UNITS shall only be connected to an appliance suitable for the same refrigerant. This unit is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this Standard, UL 60335-2-40/CSA C22.2 No.60335-2-40, or UL 1995/CSA C22.2 No 236. This unit is evaluated as a component of the EVAPORATOR UNIT, and the EVAPORATOR UNIT is a partial unit.

When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: **DANGER**, **WARNING**, **CAUTION** and **NOTICE**. These words are used with the safety--alert symbol.

⚠ **DANGER**	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

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

⚠CAUTION Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE Indicates important but not hazard-related information, used to indicate risk of property damage.



Appliance filled with flammable magas R32.



Before install the appliance, read the installation manual first.



Before use the appliance, read the owner's manual first.



Before repair the appliance, read the service manual first.

⚠WARNING

Do not use means to accelerate the defrosting process or to clean，other than those recommended by the manufacturer.

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

Do not pierce burn.

Be aware that refrigerant may not contain an odor.

⚠WARNING

Electrical shock hazard:

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

⚠WARNING

PROPOSITION 65:

Respirable particles of fiberglass are known to State of California to cause cancer. This appliance contains fiberglass insulation.

California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards. All manufacturer products meet current federal OSHA Guidelines for safety.

Products that contain or produce any of the more than 600 listed chemicals known in California can cause cancer or birth defects, such as fiberglass insulation, lead in brass and natural gas combustion products. Warnings are issued for such products sold in California as required by California Proposition 65.

All “new equipment” shipped for sale in California will have labels stating that the product contains and /or produces Proposition 65 chemicals. We cannot always know “when, or if” products will be sold in the California market. Although we have not changed our processes, having the same label on all our products facilitates manufacturing and shipping.

For appliances using FLAMMABLE REFRIGERANTS, all joints made in the installation between parts of the REFRIGERATING SYSTEM, with at least one part charged, shall be made in accordance with the following:

A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the REFRIGERATING SYSTEM parts. A vacuum valve shall be provided to evacuate the interconnecting pipe or any uncharged REFRIGERATING SYSTEM part.

Mechanical connectors used indoors shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be refabricated.

Refrigerant tubing shall be protected or enclosed to avoid damage.

⚠WARNING

All phases of this installation must conform to NATIONAL, STATE AND LOCAL CODES. If it is required for additional information, please contact your local distributor.

⚠WARNING

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

⚠WARNING

The material of plenum and ductwork must meet the standard NFPA 90B.

The supply air plenum or duct must have a solid sheet metal bottom piece directly after the air handler unit with no openings, registers or flexible air ducts located in it. The first 6 inches of supply air plenum and ductwork must be constructed of sheet metal as required by NFPA 90B. Metal plenum of duct may be connected to the non-combustible floor base for downflow. Exposing combustible non-metal. material to the supply opening of a downflow unit can cause a fire resulting in property damage, personal injury or death. If flexible supply air ducts are used they may be located only in the side walls of the rectangular plenum, a minimum of 6 inches from the solid bottom.

⚠WARNING

The temperature of the drain pan can not be above 390°F, if not may cause unit fault, overheat, deform, melt, smoke, even fire hazard.

⚠WARNING

If appliances connected via an air duct system to one or more rooms are installed in a room with an area less than shown in table 2.1, that room shall be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (for e.g. an operating electric heater, hot surfaces). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest.

For appliances connected via an air duct system to one or more rooms, auxiliary devices which may be a potential ignition source shall not be installed in the duct work. Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching devices.

For appliances connected via an air duct system to one or more rooms, only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

⚠CAUTION

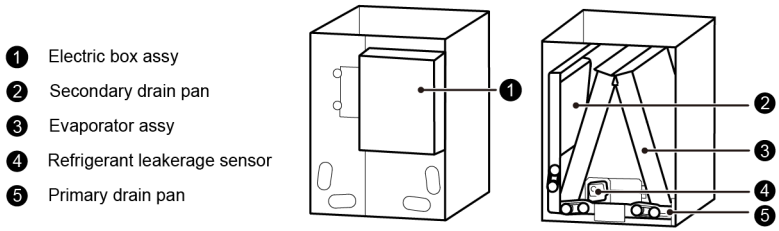
As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

2 Product Introduction

2.1 Product Description

The Quebec Vair Cased Coil offers the perfect combination of superior product quality, operating efficiency, operating sound levels and value for money. The evaporator unit uses the environmentally friendly refrigerant R32, which is chlorine-free to help prevent damage to the ozone layer.

2.2 Names of Key Components



2.3 The Range of Production Working Temperature

—	Cooling	Heating
Indoor temperature	64.4°F(18°C)~89.6°F(32°C)	50°F(10°C)~80.6°F(27°C)
Indoor humidity	≤ 80%	

NOTE: The maximum temperature of the furnace is 200°F.

2.4 Refrigerant Charge

No.	Refrigerant Perfusion(kg)	Minimum Room Area(m²)	Minimum Room Area(ft²)
1	2.5	7.4	79.7
2	2.9	8.6	92.6
3	3.8	11.2	120.3
4	4.2	12.4	133.5
5	4.6	13.7	147.5
6	5.5	16.4	176.5

Table 2.1

NOTES:

①. Based upon W/nominal tonnage, dry coil and filter should be installed.

②. Use 0.96 as approximate SCFM correction factor for wet coil.

③. The room area is calculated according to the height of 2.2m. Minimum room height is 2.2m

④. This manual is only applicable to a single room.

⑤. Correct the minimum room area of the space Amin by multiplying by an altitude adjustment factor (AF) based on for building site ground level altitude (Halt) in meters.

Halt	0	200	400	600	800	1000	1200	1400	1600
AF	1.00	1.00	1.00	1.00	1.02	1.05	1.07	1.10	1.12
Halt	1600	1800	2000	2200	2400	2600	2800	3000	3200
AF	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.40

⑥. When leakage is detected, the outdoor unit containing the compressor must stop operating; At the same time, the indoor fan should be set to the highest available rotating speed or not less than the minimum airflow in the table below. After receiving the signal to start the fan, the circulating air volume needs to reach the required value within 15 seconds.

Model	Minimum Airflow
QVEE24 QVEE36	412m³/h
QVEE48 QVEE60	540m³/h

Table 2.2

"LEAK DETECTION SYSTEM installed. Unit must be powered except for service." If any remote located REFRIGERANT SENSOR is employed to detect leaked refrigerant, such a remote located REFRIGERANT SENSOR shall also apply to this marking or be accompanied by such instructions.

3 Installation

3.1 Pre-Installation Instruction

3.1.1 Checking Product Received

After receiving the product, please check if there is any damage caused by transportation. Shipping damage is the responsibility of the carrier. Verify the model number, specifications and accessories are correct prior to installation. The distributor or manufacturer will not accept claims from dealers for transportation damage or installation of incorrectly shipped units.

3.1.2 Before Installation

Carefully read all instructions for the installation prior to installing product. Make sure each step or procedure is understood and any special considerations are taken into account before starting installation. Assemble all tools, hardware and supplies needed to complete the installation. Some items may need to be purchased locally. Make sure everything needed to install the product is on hand before starting.

3.1.3 Codes & Regulations

This product is designed and manufactured to comply with national codes. It is installer's responsibilities to install the product in accordance with such codes and/or any prevailing local codes/regulations. The manufacturer assumes no responsibilities for equipment installed in violation of any codes or regulations.

These instructions are intended as a general guide and do not supersede local or national codes in any way. Authorities who have jurisdiction should be consulted before installation.

3.1.4 Replacement Parts

When reporting shortages or damages, or ordering repair parts, give the complete product model and serial numbers as stamped on the product. Replacement parts for this product are available through your contractor or local distributor.

3.2 Important Safety Instructions

Recognize safety symbols, words, and labels

The following symbols and labels are used throughout this manual to indicate immediate or potential hazards. It is the owner's responsibility to read and comply with all safety information and instructions accompanying these symbols. Failure to heed safety information increases the risk of serious personal injury or death, property damage and/or product damage.

⚠ DANGER Immediate hazards which will result in property damage, product damage, severe personal injury or death.

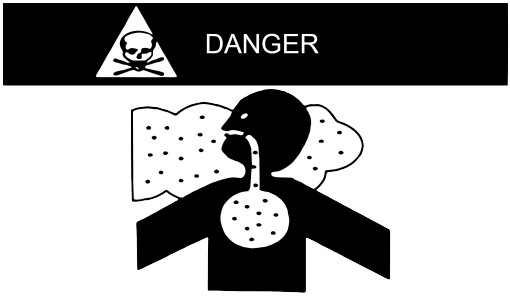
⚠ WARNING Hazards or unsafe practices could result in property damage, product damage, severe personal injury or death.

NOTICE Hazards or unsafe practices which may result in property damage, product damage, severe personal injury or death.

⚠ WARNING Before serving or installing this equipment. The electrical power to this unit must be in the "off" position. Caution, more than one disconnect may exist. Failure to observe this warning may result in an electrical shock that can cause personal injury or death.

⚠ WARNING The United States Environmental Protection Agency ("EPA") has issued various regulations regarding the introduction and disposal of refrigerants introduced into this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. These regulations may vary due to the passage of laws. A certified technician must perform the installation and service of this product. Should questions arise, contact your local EPA office.

⚠ WARNING Due to high system pressure and electrical shock in potential, installation and service work can be dangerous. Only trained and qualified persons are permitted to install or service this equipment. Observe all warnings contained in this manual and labels/tags attached to the equipment.



Special warning for installation of furnaces or air handling units in enclosed areas, such as garages, utility rooms or parking areas.

Carbon monoxide producing devices (such as an automobile, space heater, gas water heater, etc.) should not be operated in enclosed areas such as unventilated garages, utility rooms or parking areas because of the danger of carbon monoxide (CO) poisoning resulting from the exhaust emissions. If a furnace or air handler is installed in an enclosed area such as a garage, utility room or parking area and a carbon monoxide producing device is operated therein, there must be adequate ventilation directly to outside.

This ventilation is necessary to avoid the danger of CO poisoning which can occur if a carbon monoxide producing device continues to operate in the enclosed area. Carbon monoxide emission can be (re)circulated throughout the building if the furnace or air handler is operating in any mode.

CO can cause serious illness including permanent brain damage or death.

⚠WARNING

LEAK DETECTION SYSTEM installed. Unit must be powered except for service.

4 Installation

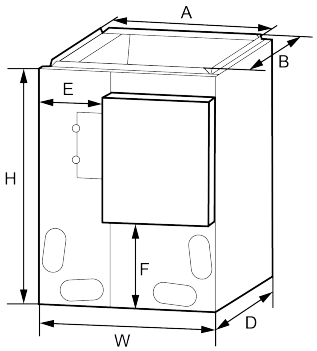
4.1 Unit Inspection

Upon delivery, inspect the unit for damage. Any damage must be reported immediately to the carrier. Do not install such an equipment damaged by freight which determines the integrity and safety of the unit.

Please check the equipment model number to ensure the unit is appropriately sized for the condensing unit.

Unit is supplied, it must not be installed and it is to be returned to the supplier. The manufacturer assumes no responsibility for the installation of incorrectly delivered units. The evaporator coil contains high-pressure inert gas for holding charge.

4.2 Dimension Data



Unit: inch(mm)

Model	Dimension						
	W	D	H	A	B	E	F
QVEE24	17-1/2 (445)	21-1/4 (540)	23 (584)	15-7/8 (403)	19-3/8 (492)	7-1/6 (182)	9 (228)
QVEE36	17-1/2 (445)	21-1/4 (540)	23 (584)	15-7/8 (403)	19-3/8 (492)	7-1/6 (182)	9 (228)
QVEE48	24-1/2 (622)	21-1/4 (540)	28-1/2 (724)	22-7/8 (581)	19-3/8 (492)	8 (204)	4-1/8 (105)
QVEE60	24-1/2 (622)	21-1/4 (540)	28-1/2 (724)	22-7/8 (581)	19-3/8 (492)	8 (204)	4-1/8 (105)

NOTE: The outdoor unit models that can be matched with the indoor unit can be found on the AHRI website. The brand of compressor refrigerant oil is FW68L.

4.3 Location

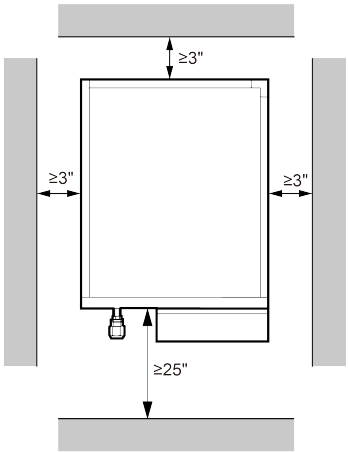
⚠WARNING This coil is designed for indoor installation only. Do not install it outdoors.

⚠WARNING Not suitable for use with ammonia.

When installing the coil, take consideration to minimize the length of refrigerant tubing as much as possible. Do not install the air handler in a location either above or below the condenser that violates the instructions provided with the condenser. Service

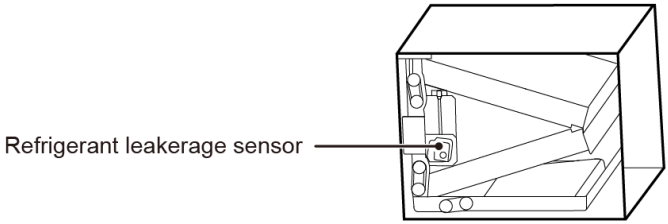
clearance is to take precedence. Allow a minimum of 25” in front of the unit for service clearance, as shown below.

Unit: inch



When installing in an area directly over a finished ceiling (such as an attic), an emergency drain pan is required directly under the unit. See local and state codes for requirements. When installing this unit in an area that may become wet, elevate the unit with a sturdy, non-porous material. In installations that may lead to physical damage (i.e. a garage) it is advised to install a protective barrier to prevent such damage.

4.4 Lying Installation



NOTE: Before adopting the installation method shown in the figure, the secondary drain pan needs to be installed on the other side of the unit. And, the refrigerant sensor needs to be installed in the position shown in the figure, remove the fixing screws of the Refrigerant Sensor and adjust the internal wiring to ensure that the internal wiring does not touch the sharp side, the wiring cannot exceed the drip pan and the wiring must not come into contact with water.

NOTES:

The unit is equipped with a refrigerant sensor. The sensor has a lifetime of 15 years.

At the end of lifetime or when the sensor fault, the mainboard displays error code "FE", and emits an alarm sound. The unit will require the fan to be forced on, and the outdoor unit and gas valve of the furnace to be turned off.

When the sensor detects refrigerant leak, the mainboard displays error code "EA", and emits an alarm sound. The unit will require the fan to be forced on, and the outdoor unit and gas valve of the furnace to be turned off.

If the refrigerant sensor is damaged, replace the refrigerant sensor as follows:

①. Remove the lower front side panel.

②. Remove the fixing screws of the refrigerant sensor.

③. Replace the refrigerant sensor with a new one.

The service life of the refrigerant sensor is fifteen years and the refrigerant sensor of the refrigerant detection system can only be replaced with the particular sensor which is specified by the manufacturer.

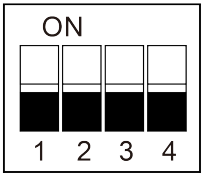
④. Where a single remote refrigerant sensor is used in a room with multiple units, all units in the room which do not have a dedicated refrigerant detection system shall take the same actions. When an ITE COOLING APPLIANCE or PARTIAL UNIT'S REFRIGERANT DETECTION SYSTEMS for an appliances refrigerant circuit resets to a safe condition the unit shall not be allowed to initiate NORMAL OPERATIONS until all REFRIGERANT DETECTION SYSTEM systems in the CIRCULATION AIRFLOW have been reset.

Where a single REMOTE REFRIGERANT DETECTION system sensor is used in a room with multiple units, this requirement shall apply to all units in the room which do not have a dedicated REFRIGERANT DETECTIONSYSTEM.

Continuous air circulation required for proper functioning. Unit must be powered except for service.

4.5 Dip Switch Configuration

Through the 4 dip switches (SA1) on the main control board. related functions of the unit can be set.



DIP switch position	Function description
1	0: 24V connection. 1: RS485 communication connection (Default).
2	Default is 1, please do not adjust arbitrarily.
3	Default is 1, please do not adjust arbitrarily.
4	Capacity dip switch, has been set before leaving the factory, please do not adjust arbitrarily.

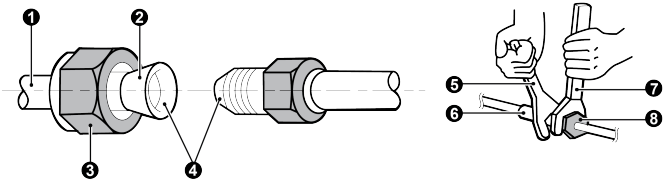
NOTE: “0” means dip switch to “ON”, “1” means dip switch to number.

4.6 Piping Work

4.6.1 Specification of Connection Pipe

Model	External diameter (inch)	
	Gas pipe	Liquid pipe
QVEE24	Φ3/4	Φ3/8
QVEE36		
QVEE48		
QVEE60		

4.6.2 Piping Preparation



Cased Coil

Pipe diameter (inch)	Tightening torque (N·m)
Φ3/8	35-40
Φ1/2	45-50
Φ5/8	60-65
Φ3/4	70-75

4.7 Condensate Removal

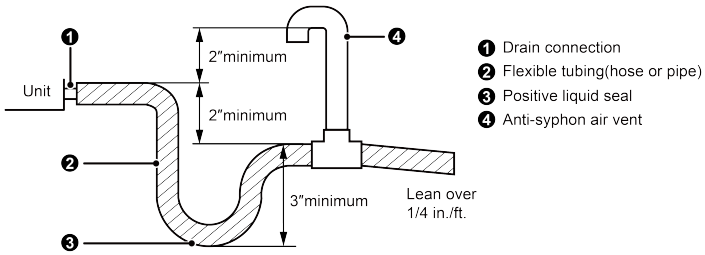
(1) It is not allowed to connect the condensate drain pipe into waste pipe or other pipelines which are likely to produce corrosive or peculiar smell to prevent the smell from entering indoors or corrupt the unit.

(2) It is not allowed to connect the condensate drain pipe into rain pipe to prevent rain water from pouring in and cause property loss or personal injury.

(3) The unit shall be sloped at least 1/8 in./ft (10 mm/m) from the horizontal toward the drain outlet such that water drains freely from the pan whether the fan is ON or OFF.

(4) Condensate drain pipe should be connected into special drain system for air conditioner.

(5) The drain pan has primary and secondary drain connection. Condensate removal is performed by attaching a 3/4″ PVC pipe to the evaporator coil pan and terminated in accordance with local or state Plumbing/HVAC codes. The installation must include a trap that is located closely to the evaporator coil. Do not over-tighten the drain connection in order to prevent possible damage to the evaporator drain pan. See the following figure for details of a typical condensate line trap. Installation of anti-backflow fitting can also be adopted; detailed information about the fitting can be obtained by contacting the contractor.



4.8 Ductwork

This coil is designed for a complete supply and return ductwork system.

⚠WARNING

Do not operate the unit without all ductwork completed.

Do not operate this product without all ductwork attached.

Inadequate ductwork that restricts airflow can result in improper performance and compressor or furnace failure. Ductwork is to be constructed in a manner that limits restrictions and maintains suitable air velocity. Ductwork is to be sealed to the unit in a manner that will prevent leakage.

Return ductwork: Do not terminate the return ductwork in an area that can introduce toxic or objectionable fumes/odors into the ductwork. The return ductwork is to be introduced into the coil.

Return Air Filters: Each installation must include a return air filter. This filtering may be performed at the coil or externally such as a return air filter grille.

4.9 Unit Installation

⚠WARNING Risk of explosion or fire.

⚠WARNING Can cause injury or death.

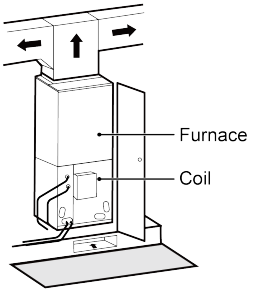
Connect the return air outlet of the A-coil to the air outlet of the furnace and secure it with the screws provided on site.

NOTE:

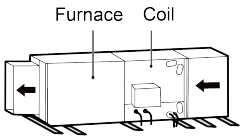
A stable connection is required between the coil and the furnace to prevent dumping.

Based upon the actual conditions, if coil is installed as Fig (A), the coil should be concealed in a specific room or space and make sure the coil is not accessible to the general public.

Based upon the actual conditions, if coil is installed as Fig (B), make sure that there is enough space for care and maintenance. And the coil is not accessible to the general public.



(A)



(B)

Based upon the actual conditions, the coil unit come factory installed with a vertical and horizontal drain pans and can be configured for upward flow or horizontal pull-through installations.

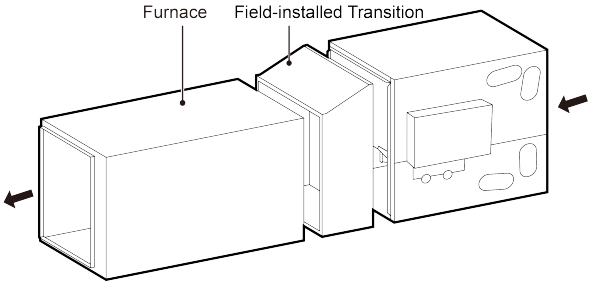
When the coil matches blower, the side which is nearby from coil is NOT allowed to install electric heater kit. Recommended configuring is as shown below.

(a) Standard Application: Left hand shown / Right hand similar (not shown)

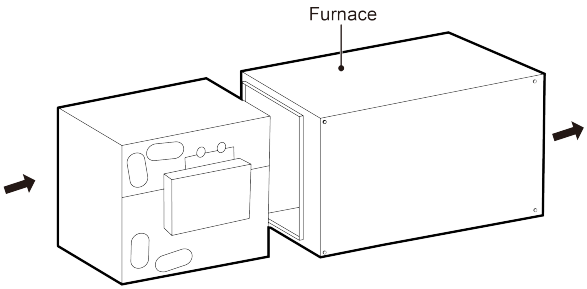
(b) Counter flow: Right hand shown / Left hand similar (not shown)

(c) Upward flow

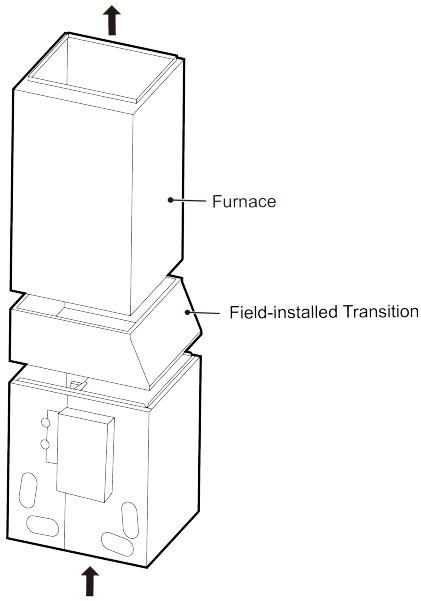
(d) Downward flow



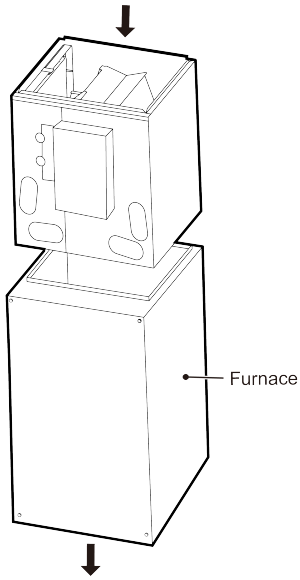
(a)



(b)



(c)



(d)

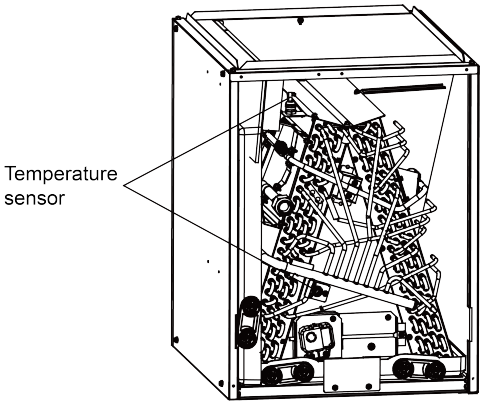
If the air inlet of furnace is different with the air outlet of coil in size, it may be necessary to install a field-installed transition between the furnace and the coil to proper airflow distribution (as shown in figure (a) or (c)). To accommodate various installation conditions at the project site, the coil inlet can also be connected to the furnace outlet. If the air outlet of furnace is different with the air inlet of coil in size, it is also necessary to install a field-installed transition (not shown in the figure).

Coil should be pitched slightly toward the drain connection. It is recommended to add silicone caulk between drain pans to prevent water seepage.

In order to avoid condensate water leakage, it is recommended that the unit install with an external drain pan and check the drain of the unit regularly.

⚠CAUTION

When the downward flow installation method is used. The indoor ambient temperature sensor of the unit needs to be moved to the windward side, and air outlet temperature sensor needs to be moved to the leeward side. As shown in the figure, swap the positions of the two temperature sensors. Otherwise, the unit may operate abnormally.



4.10 Electrical Installation

4.10.1 Requirement and Notice on Electrical Installation

⚠WARNING

The electrical installation for the air conditioner should observe the following requirements:

①. The electrical installation must be conducted by professionals in compliance with local laws and regulations and the instructions in this manual. Never extend the power cords. The electric circuit must be equipped with a circuit breaker and air switch both with sufficient capacity.

②. The unit's operating power must be within the nominal range stated in the instruction manual. Use a specialized power circuit for the air conditioner. Do not draw power from another power circuit.

③. The air conditioner circuit should be at least 1.5m away from any inflammable surface.

④. The external power cords, the thermostat wires and thermostat must be effectively fixed.

⑤. The external power cords, the thermostat wires and thermostat can't directly contact any hot objects. For example: they must not contact chimney pipes, warm gas pipes or other hot objects.

⑥. The external power cords, the thermostat wires and thermostat must not be squeezed. Never pull, stretch or bend the wires.

⑦. The external power cords, the thermostat wires and thermostat must not collide with any metal beam or edge on the ceiling, or touch any metal burrs or sharp metal edge around.

⑧. Connect wires correspondingly by referring to the circuit diagram labeled on the unit or electric box. Screws must be tightened up. Slipped screws must be replaced by specialized flat-head screws.

⑨. Wiring terminals should be connected firmly to the terminal board. Loose connection is forbidden.

⑩. After the electrical installation is finished, please use wire clamps to secure the power cords and the thermostat wires. Make sure the wires are not clamped too tight.

⑪. The wire gauge of power cord should be large enough. Damaged power cords or other wires must be replaced by specialized wires. Wiring work must be done according to national wiring rules and regulations.

4.10.2 Electrical Parameters

Model	Power Supply
QVEE24	24V ~ 1Ph 60Hz
QVEE36	
QVEE48	
QVEE60	

NOTICE

①. Install a circuit breaker at every power terminal near the units (indoor unit and thermostat) with at least 3mm contact gap. The units must be able to be plugged or unplugged.

②. Specifications of circuit breaker are based on a working condition where the working temperature is 40℃. If working condition changes, please adjust the specifications according to national standards.

③. Adopt 5pc of AWG18 power cords to be the communication cords between indoor unit, thermostat, and furnace. The maximum length is 30m. Please select a proper length according to local conditions. Communication cords must not be twisted together.

④. Instruction for installation of the critical-to-safety wiring connection of the leak detection sensor or leak detection system to the furnace assembly. The wiring shall be not less than 18 AWG with a minimum insulation thickness of 1.58 mm or protected from damage. Critical-to-safety wiring is any field installed wiring necessary to fulfill the requirements of table 1 in the event of detection of a leak;

Shall not be installed on furnaces with an inductive electrical greater than Le as calculated as follows:

The switched electrical load (Le) in kVA is less than or equal to:

- Le = 5 x (6,7/Su)4 when breaking all phases;

- Le = 2,5 x (6,7/Su)4 when breaking two legs of a three-phase load, or when breaking one or two legs of a single-phase load.

Where:

Le is the switched inductive electrical load in kilovolt amperes (kVA);

Su is the burning velocity of a refrigerant in centimeters per second (cm/s).

Detection of a leak shall turn on the indoor fan at the highest available speed or turn it on to not less than the minimum airflow as shown in table 2.2.

⑤. Continuous air circulation required for proper functioning. Unit must be powered except for service.

⑥. All wires must go through the tube.

4.10.3 Connection of Power Cords and Thermostat Wires

(1) For solid wires (as shown below):

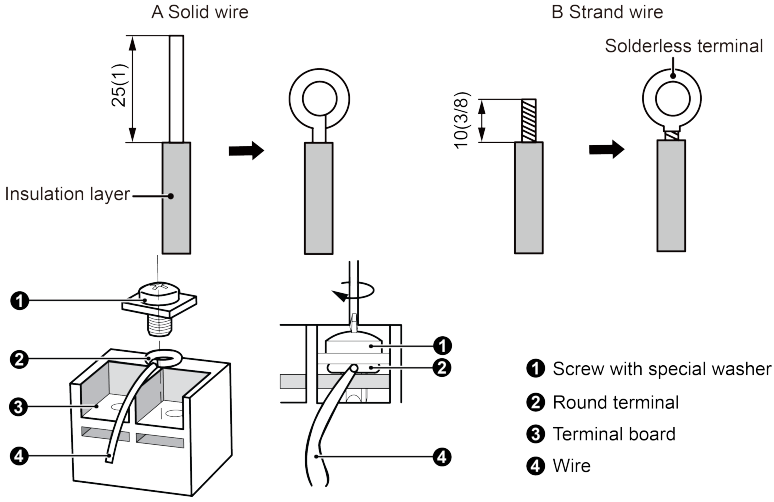
1) Use wire cutters to cut off the wire end and then peel away about 25mm of the insulation layer.
2) Use a screwdriver to unscrew the terminal screw on the terminal board.
3) Use nippers to bend the solid wire into a ring that fits the terminal screw.
4) Form a proper ring and then put it on the terminal board. Use a screwdriver to tighten up the terminal screw.

(2) For strand wires (as shown below):

1) Use wire cutters to cut off the wire end and then peel away about 10mm of the insulation layer.
2) Use a screwdriver to unscrew the terminal screw on the terminal board.
3) Use a round terminal fastener or clamp to fix the round terminal firmly on the peeled wire end.

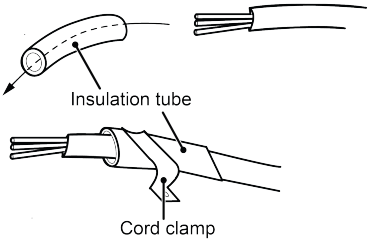
4) Locate the round terminal conduit. Use a screwdriver to replace it and tighten up the terminal screw (as shown below).

Unit: mm(inch)



(3) How to connect the thermostat wires and power cords.

Lead the thermostat wires and power cords through the insulation tube. Then fix the wires with wire clamps (as shown in the following figure.)



⚠WARNING

①. Before working, please check whether the indoor unit and thermostat are powered on.

②. Match the terminal numbers and wire colors with the colors indicated in the indoor unit.

③. Wrong wire connection may burn the electrical components.

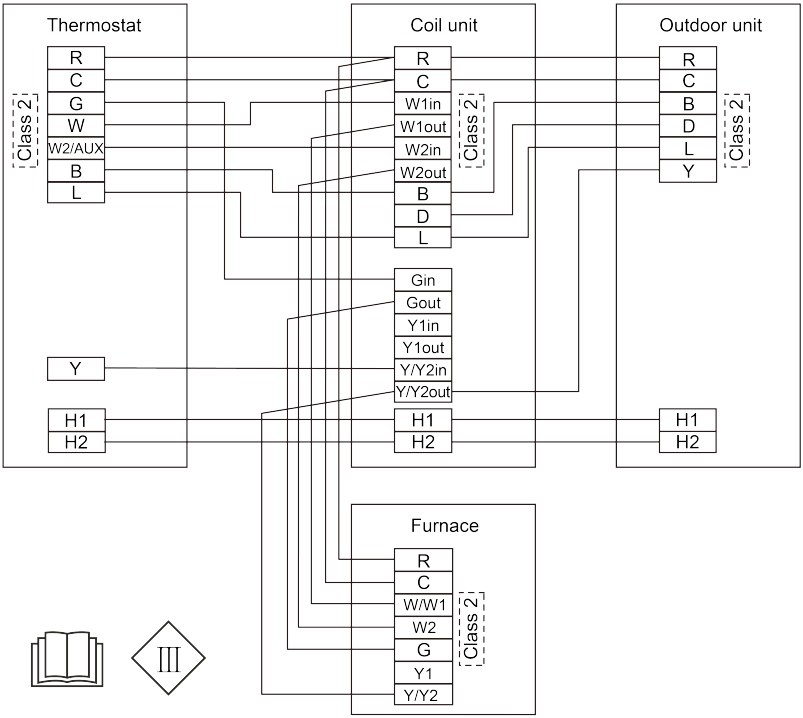
④. Connect the wires firmly to the wiring box. Incomplete installation may lead to fire hazard.

⑤. Please use wire clamps to secure the external covers of connecting wires. (Insulators must be clamped securely; otherwise, electric leakage may occur.)

⑥. Ground wire should be connected.

Cased Coil

Electrical wiring:



NOTES:

R means 24V AC power supply from the furnace.

C means 24V common from the furnace.

B which is energized under the heating mode means 4-way valve control signal.

D means defrosting signal.

G means fan signal.

Gin means fan signal from the thermostat.

Gout means fan signal to the furnace.

Y1/Y/Y2 means compressor control signal from the thermostat or to the furnace and the outdoor unit.

Y1in/Y/Y2in means compressor control signal from the thermostat.

Y1out/Y/Y2out means compressor control signal to the furnace and the outdoor unit.

W/W1/W2/AUX means the gas valve control signal.

W1in/W2in means the gas valve control signal from the thermostat.

W1out/W2out means the gas valve control signal to the furnace.

L means refrigerant leakage protection signal.

H1/H2 means RS485 communication. When the dip switch is set to RS485 communication, the corresponding terminals of the coil unit and outdoor unit must be connected.

NOTE: The power of the coil unit is supplied by the furnace at 24V. It must meet CLASS 2 power requirements.

NOTE: For cooling only unit, there is no need to connect the B and D terminals.

NOTE: When outdoor defrosts, D of outdoor unit will send 24V signal.

NOTE: For 1-stage AC or HP, there is no Y1 terminal on the outdoor unit, so the relevant wiring does not need to be connected.

NOTE: For 1-stage furnace, the Y1 terminal on the outdoor unit does not need to be connected.

NOTE: L must be connected and connected to the outdoor unit.

NOTE: Breaker must be incorporated in the fixed wiring in accordance with the wiring rules.

NOTE: Thermostat model: WK-010WC1.

⚠WARNING

①. Low voltage wires should be led through rubber rings of the electric box cover.

②. Do not bundle up the thermostat wires or lay them side by side, otherwise errors will occur.

③. High and low voltage wires should be secured separately. Secure the former ones with big clamps and the latter ones with small clamps.

④. Use screws to tighten up the thermostat wires and power cords of unit on the terminal board. Wrong connection may lead to fire hazard.

⑤. If the thermostat wires of unit and power cords are not correctly connected, the air conditioner may get damaged.

⑥. Ground the unit through connecting the ground wire.

⑦. The units should comply with applicable local and national rules and regulations on power consumption.

⑧. When connecting the power cords, make sure the phase sequence of the power supply matches with the corresponding terminals, Otherwise, the unit may be damaged.

4.11 Sealing Ducts

⚠WARNING

Use fiberglass sealing strips, caulking, or equivalent sealing method between the plenum and the coil unit to ensure a tight seal.

Ensure that the duct is secured and all joints are properly sealed to the coil cabinet flanges.

All indoor cabinets **MUST** be taped after installation to seal against any air leaks. System performance and efficiency will be reduced if air leakage exists.

There must be sealed with sponge or other thermal insulation material where around the cut-off valves to prevent air leakage or water seepage.

It is necessary to paste sponge seal around the air outlet to prevent leakage.

4.12 Leak Testing, Vacuuming and Charging

Refer to the outdoor unit instruction for leak testing, vacuuming and charging. Always leak check entire system before charging.

When vacuuming, you need to vacuum the liquid and gas pipe at the same time, and do not open the cut-off valve of coil until vacuum finished.

5 Blower Speed Selection

Proper air volume must be provided over the evaporator coil. The air volume is selected according to the length of the air duct installed by the project and the static pressure. The air volume for performance testing is shown in the table below. The air volume of the unit operation should not be lower than 75% of the values shown in the table.

Cabinet		Air Volume (CFM)
Model	Width(in.)	
QVEE24	17.5	600
QVEE36	17.5	800
QVEE48	24.5	1100
QVEE60	24.5	1200

NOTES:

①. Unless the circulating fan is energized, the refrigerant circulation system can operate. The refrigerant circulation system and the gas valve of the furnace cannot operate simultaneously.

②. The evaporator coil static pressure resistance inside the unit is maximum 75 pa (0.3 inches W.C.). Air volume, static pressure relationship as shown in the table below.

Air Volume (CFM) / Model	Static pressure (Inches W.C.)			
	0.12	0.18	0.23	0.3
QVEE24	450	600	800	850
QVEE36	/	600	800	850
QVEE48	825	900	1100	1200
QVEE60	/	900	1100	1200

6 Code List

No.	Code	Error or status
1	EA	Indoor unit refrigerant leakage protection.
2	FE	Refrigerant sensor error or refrigerant sensor communication error.
3	E6	Indoor unit and outdoor unit communication error.
4	CJ	Indoor Jumper cap failure.
5	C1	Indoor ambient temperature sensor error.
6	C2	Indoor pipe temperature sensor error.
7	FJ	Indoor air outlet temperature sensor error.
8	CA	Evaporator inlet pipe temperature sensor error.
9	Cb	Evaporator outlet pipe temperature sensor error.
10	E8	Indoor unit overheat protection.
11	E2	Evaporator freeze prevention protection.
12	C0	Indoor unit and thermostat communication error.

NOTE: If several errors happen at the same time, error codes will show on the display repeatedly.

7 Maintenance and Care

Regular check, maintenance and care should be performed by professional personnel, which will prolong the unit life span.

7.1 Drain Pipe

Regularly check if the drainage pipe is clogged to ensure that condensate water can drain smoothly.

7.2 Notice before Seasonal Use

(1) Check if the inlet/outlet of the indoor unit is clogged.

(2) Check if the filter screen has been set soundly.

(3) Check if the unit is installed firmly. If there is something abnormal, please contact the local appointed service center.

7.3 Maintenance after Seasonal Use

(1) Clean the dust of sundries on the indoor units.

(2) In the event of rusting, use the anti-rust paint to stop spreading of rust.

7.4 Parts Replacement

Purchase parts from local appointed service center or dealer if necessary.

8 After-Sales Service

In case the air-conditioning unit you bought has any quality problem or you have any inquiry, please contact the local after-sales service agency designated by factory.

Warranty should meet the following requirements:

(1) First run of the unit should be operated by professional personnel from factory appointed service center.

(2) Only factory manufactured accessories can be used on the machine.

(3) All the instructions listed in this manual should be followed.

(4) Warranty will be automatically invalid if fails to obey any item mentioned above.

9 For the Requirements of Gas Furnaces

According to the latest UL 60335-2-40 regulations, A-coil and gas furnaces must meet specific requirements for operating air volume. According to the following formula, the minimum air volume requirements for the operation of the gas furnace can be calculated for the refrigerant charging capacity of different A-coil models. If the operating air volume of the gas stove does not meet the minimum air volume requirement, replace the gas stove with another one.

$$Q_{min} = 30 \times m_c / LFL$$

Where:

Q_{min} is the minimum circulation airflow in m^3/h.

m_c is the actual refrigerant charge in the system in kg.

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

For example, the refrigerant charge of A-coil with R32 is 0.306 kg/m^3, and system refrigerant charge is 3.8kg, the minimum operating air volume of the gas furnace used with A-coil is 373 m^3/h or 219 CFM. When leakage is detected, the gas valve of the gas furnace must be closed.

10 Qualification of Worker

The manual shall contain specific information about the required qualification of the working personnel for maintenance, service and repair operations. Every working procedure that affects safety means shall only be carried out by competent persons. The training of these procedures is carried out by national training organisations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. The achieved competence should be documented by a certificate.

Examples for such working procedures are:

(1) breaking into the refrigerating circuit;

(2) opening of sealed components;

(3) opening of ventilated enclosures.

11 Transportation, Marking and Storage for Units that Employ Flammable Refrigerants

11.1 General

The following information is provided for units that employ FLAMMABLE REFRIGERANTS.

11.2 Transport of Equipment Containing Flammable Refrigerants

Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment permitted to be transported together will be determined by the applicable transport regulations.

11.3 Marking of Equipment Using Signs

Signs for similar appliances used in a work area are generally addressed by local regulations and give the minimum requirements for the provision of safety and/ or health signs for a work location.

All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs.

The effectiveness of signs should not be diminished by too many signs being placed together.

Any pictograms used should be as simple as possible and contain only essential details.

11.4 Disposal of Equipment Using Flammable Refrigerants

See national regulations.

11.5 Storage of Equipment/Appliances

The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.

11.6 Storage of Packed (Unsold) Equipment

Storage package protection should be constructed in such a way 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

12 Information on Servicing

12.1 General

The manual shall contain specific information for service personnel according to 12.2 to 12.10.

12.2 Checks to the Area

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the REFRIGERATING SYSTEM,12.3 to 12.7 shall be completed prior to conducting work on the system.

12.3 Work Procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

12.4 General Work Area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

12.5 Checking for Presence of Refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

12.6 Presence of Fire Extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

12.7 No Ignition Sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall 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 shall be displayed.

12.8 Ventilated Area

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.

12.9 Checks to the Refrigerating Equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance. The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

(1) The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;

(2) The ventilation machinery and outlets are operating adequately and are not obstructed;

(3) If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

(4) Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

(5) Refrigerating 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.

12.10 Checks to Electrical Devices

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 shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:

(1) That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;

(2) That no live electrical components and wiring are exposed while charging, recovering or purging the system;

(3) That there is continuity of earth bonding.

⚠WARNING

Only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork for duct connected appliances, false ceilings 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.

12.11 Pipe Installation

That pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

That after completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected.

The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.

13 Sealed Electrical Components shall be Replaced

14 Intrinsically Safe Components must be Replaced

15 Cabling

Check that cabling 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.

16 Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all 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 shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE Examples of leak detection fluids are

(1) Bubble method.

(2) Fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Clause 16.

17 Removal and Evacuation

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to: The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.

– Safely remove refrigerant following local and national regulations;

– Evacuate;

– Purge the circuit with inert gas (optional for A2L);

– Evacuate (optional for A2L);

– Continuously flush or purge with inert gas when using flame to open circuit;

– Open the circuit.

Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

18 Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed.

(1) Ensure that contamination of different refrigerants does not occur when using charging equipment.

(2) Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.

(3) Cylinders shall be kept in an appropriate position according to the instructions.

(4) Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.

(5) Label the system when charging is complete (if not already).

(6) Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

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

19 Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall 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.

(1) Become familiar with the equipment and its operation) Isolate system electrically.

(2) Before attempting the procedure, ensure that:

  1) Mechanical handling equipment is available, if required, for handling refrigerant cylinders;

  2) All personal protective equipment is available and being used correctly;

  3) The recovery process is supervised at all times by a competent person;

  4) Recovery equipment and cylinders conform to the appropriate standards.

(3) Pump down refrigerant system, if possible.

(4) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
(5) Make sure that cylinder is situated on the scales before recovery takes place.
(6) Start the recovery machine and operate in accordance with instructions.
(7) Do not overfill cylinders (no more than 80 % volume liquid charge).
(8) Do not exceed the maximum working pressure of the cylinder, even temporarily.
(9) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
(10) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

20 Labelling

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

21 Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good 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 are designated for the recovered refrigerant and labelled 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 shall be in good working order with a set of instructions concerning the equipment that is at hand and shall 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 shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall 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 shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

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