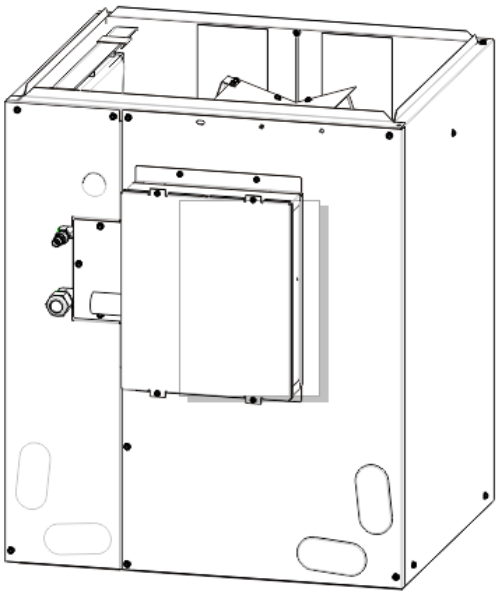
Installation, Operation, and Maintenance

Cased Aluminum Convertible Coils

5DXCB003AC3HCA
5DXCB005AC3HCA
5DXCD008AC3HCA
5DXCD010AC3HCA



Note: *Graphics in this document are for representation only. Actual model may differ in appearance.*

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

January 2026

COR-SVX002B-EN

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

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

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/ sleeves, butyl gloves, safety glasses, hard hat/ bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

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

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

⚠ WARNING

Cancer and Reproductive Harm!

This product can expose you to chemicals, including lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

⚠ WARNING

Safety Hazard!

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

This unit is not to be used 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 the use of the appliance by a person responsible for their safety.

Do not allow children to play or climb on the unit or to clean or maintain the unit without supervision.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury and/or property damage.

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

⚠ WARNING

Safety Hazard!

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

Connect the air handler to an outdoor unit suitable for use with R-454B refrigerant only.

⚠ WARNING

Risk of Fire — Flammable Refrigerant!

Failure to follow instructions below could result in death or serious injury, and equipment damage.

- **To be repaired only by trained service personnel.**
- **Do not puncture refrigerant tubing.**
- **Dispose of properly in accordance with federal or local regulations.**

⚠ WARNING

Recover Refrigerant!

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

System contains refrigerant under high pressure. Recover refrigerant per standard procedures and guidelines before proceeding with additional steps.

⚠ WARNING

Safety Hazard!

Failure to follow instructions below could result in death or serious injury and equipment or property damage.

- **Do not use any items other than those approved by the manufacturer for defrosting or cleaning process.**
- **Store the appliance in a room without continuously operating ignition sources(for example: open flames, an operating gas appliance, or an operating electric heater).**
- **Do not pierce or burn.**
- **Be cautious that refrigerants may be odorless.**

⚠ WARNING

Risk of Fire!

Failure to follow the safety precautions could result in serious injury, death, or property damage.

Only approved auxiliary devices listed in this manual and declared suitable with the refrigerant must be installed in the connecting ductwork. Devices that may be potential ignition sources, such as hot surfaces or electric switching devices, must not be installed unless approved by the manufacturer or declared suitable with the refrigerant used.

⚠ CAUTION

Corrosion Hazard!

Failure to follow instructions below could result in minor to moderate injury or property damage.

To prevent shortening its service life, do not use modular blower during the finishing phases of construction or remodeling. The low return air temperatures can lead to the formation of condensate. Condensate in the presence of chlorides and fluorides from paint and other components creates a corrosive condition which may cause rapid deterioration of the cabinet and internal components.

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Table of Contents

Overview

This unit is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this International Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this International Standard.

Unit Description

Figure 1. Key components

1. Electric box assembly
2. Secondary drain pan
3. Evaporator assembly
4. Refrigerant leakage sensor
5. Primary drain pan

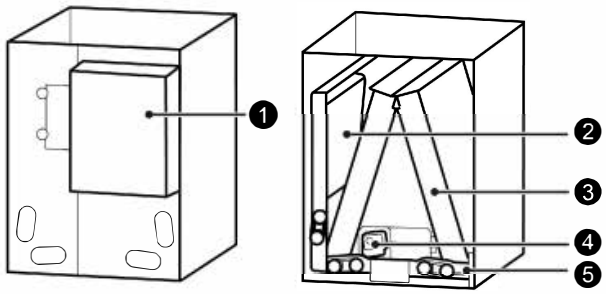


Table 1. Operating range

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

Note: The maximum supply air temperature of the furnace is 200°F.

Unit Inspection

Check the equipment model number to confirm the unit is appropriately sized for the condensing unit.

The evaporator coil contains high-pressure inert gas for holding charge.

Dimensional Data

Figure 2. Dimensional data

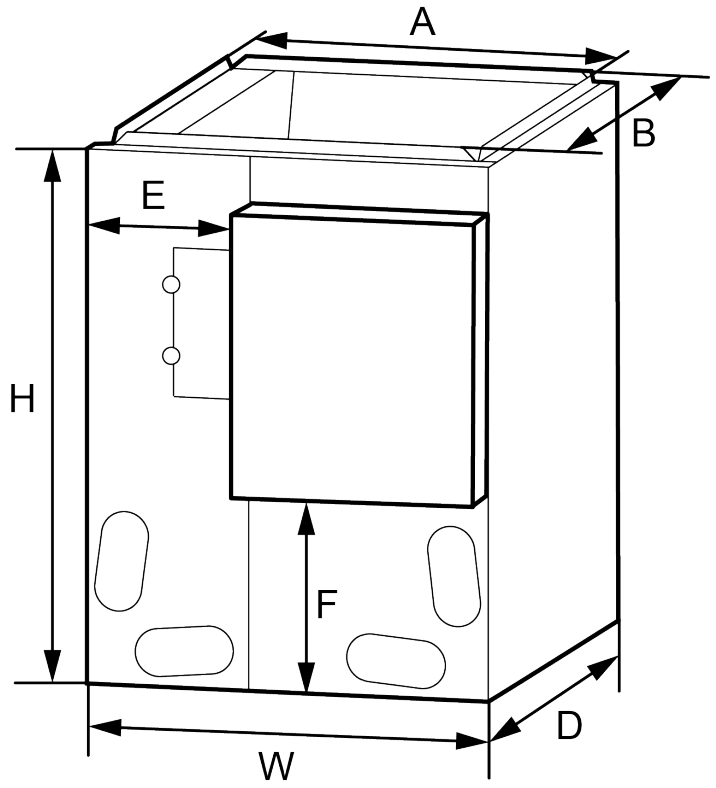
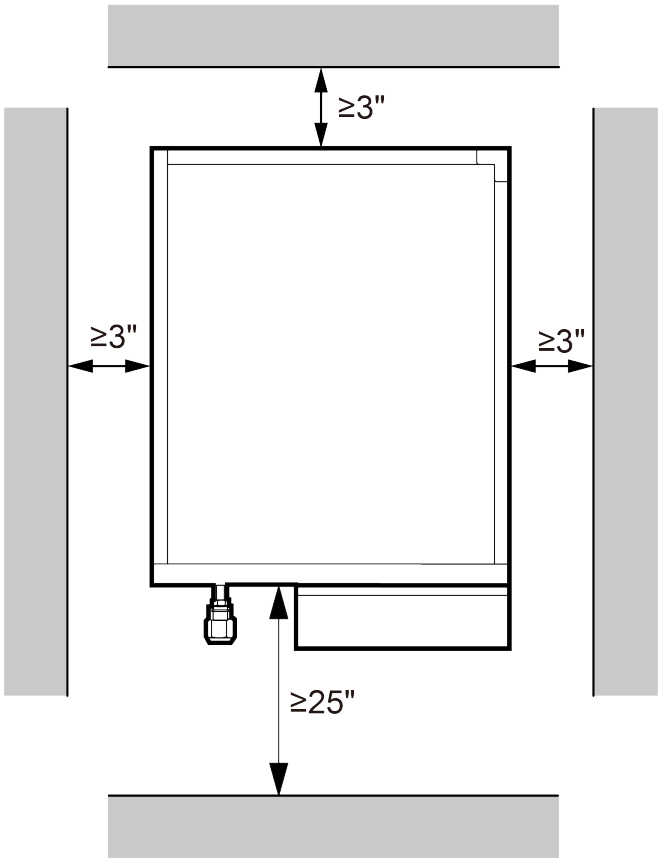


Table 2. Dimensional data

Model	Dimension						
	W	D	H	A	B	E	F
5DXCB003AC3-HCA	17-1/2 in. (445 mm)	21-1/4 in. (540 mm)	23 in. (584 mm)	15-7/8 in. (403 mm)	19-3/8 in. (492 mm)	7-1/6 in. (182 mm)	9 in. (228 mm)
5DXCB005AC3-HCA	17-1/2 in. (445 mm)	21-1/4 in. (540 mm)	23 in. (584 mm)	15-7/8 in. (403 mm)	19-3/8 in. (492 mm)	7-1/6 in. (182 mm)	9 in. (228 mm)
5DXCD008AC3-HCA	24-1/2 in. (622 mm)	21-1/4 in. (540 mm)	28-1/2 in. (724 mm)	22-7/8 in. (581 mm)	19-3/8 in. (492 mm)	8 in. (204 mm)	4-1/8 in. (105 mm)
5DXCD010AC3-HCA	24-1/2 in. (622 mm)	21-1/4 in. (540 mm)	28-1/2 in. (724 mm)	22-7/8 in. (581 mm)	19-3/8 in. (492 mm)	8 in. (204 mm)	4-1/8 in. (105 mm)

Unit Clearances

Figure 3. Unit clearances



When installing the coil:

- Minimize the length of refrigerant tubing.
- 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 take precedence.
- Allow a minimum of 25 inches in front of the unit for service clearance, as in Figure 3, p. 8.

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.

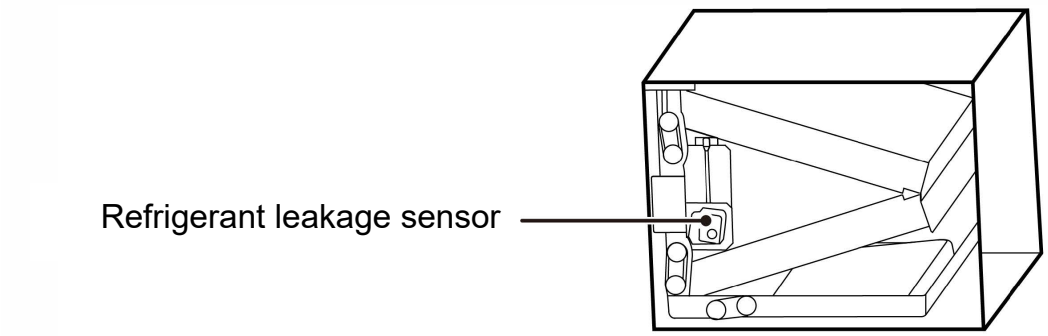
When installing this unit in an area that may become wet, elevate the unit with a sturdy, non-porous material. In installations that may lead to physical damage (such as a garage) it is advised to install a protective barrier to prevent such damage.

Note: *When installing this unit the control box may be installed on the side of the coil using the pilot holes provided or it may be mounted on a nearby wall.*

Installation

Horizontal Installation

Figure 4. Leak sensor location



Before installing horizontally:

- A secondary drain pan needs to be installed on the other side of the unit.
- The refrigerant sensor needs to be installed in the position shown in Figure 4, p. 9.

1. Remove the screws from the refrigerant sensor.
2. Adjust the internal wiring so it does not touch any sharp edges. The wiring cannot exceed the drip pan nor come in contact with water.
3. Move the sensor to the location shown in Figure 4, p. 9.
4. Secure the sensor with the screws.

Note: *The wiring cannot exceed the drip pan and the wiring must not come into contact with water.*

A2L Mitigation Operation

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 fails, the board displays error code **FE**, and sounds an alarm. The unit requires 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 board displays error code **EA**, and sounds an alarm.. The unit requires 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:

1. Remove the lower right side panel.
2. Remove the screws from the refrigerant sensor.
3. Replace the refrigerant sensor.

The service life of the refrigerant sensor is 15 years, and the refrigerant detection system refrigerant sensor can only be replaced with a manufacturer-supplied sensor.

After installation, the installer must verify that the refrigerant leak detection system actuates all mitigating actions.Initiate the test by unplugging the mitigation sensor. Confirm the error code is triggered and actuates the mitigation actions, such as turning on the indoor unit blower, energizing an audible alarm, if so equipped, and turning off the outdoor unit compressor.

⚠ WARNING

Leak Detection System Installed!

Failure to follow instructions below could result in death or serious injury or equipment damage.
The unit is equipped with electrically powered safety measures and must be powered at all times after installation, except during servicing, to detect any leak.

Condensate Removal

Condensate drain connections are located in the drain pan at the bottom of the coil/enclosure assembly.

The threaded fitting protrudes outside of the enclosure for external connection. A field fabricated trap is not required for proper drainage due to the positive pressure of the furnace. However, it is recommended to prevent efficiency loss of conditioned air.

1. The drain hole in the drain pan must be cleared of all insulation.
2. Insulate the primary drain line to prevent sweating where dew point temperatures may be met. (Optional depending on climate and application needs)
3. Connect the secondary drain line to a separate drain line (no trap is needed in this line).

Unit Installation

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

Notes:

- *A stable connection is required between the coil and the furnace.*
- *For vertical installation (see Figure 5, p. 10), the coil should be contained in a room or space that is not accessible to the general public.*
- *For horizontal installation (see Figure 6, p. 10), confirm there is clearance for maintenance and that the coils is not accessible to the general public.*

Figure 5. Vertical installation

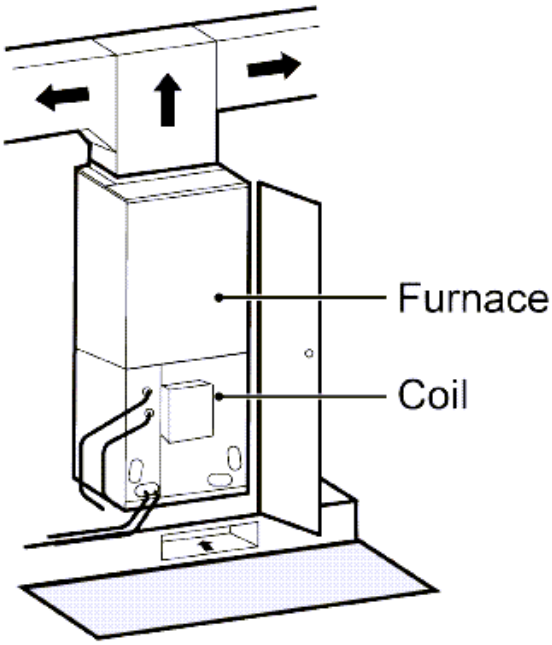
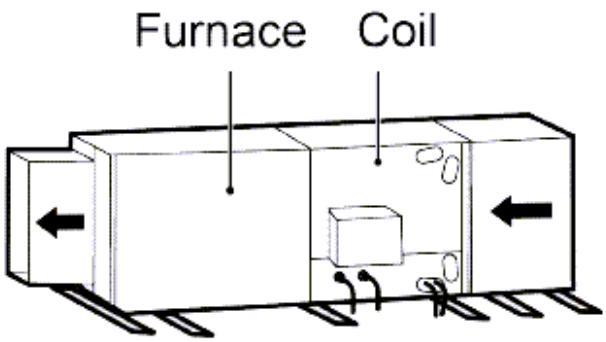


Figure 6. Horizontal installation



The coil unit comes with factory-installed vertical and horizontal drain pans and can be configured for upward flow or horizontal pull-through installations.

Figure 7. Standard application (left hand shown, right hand similar but not shown)

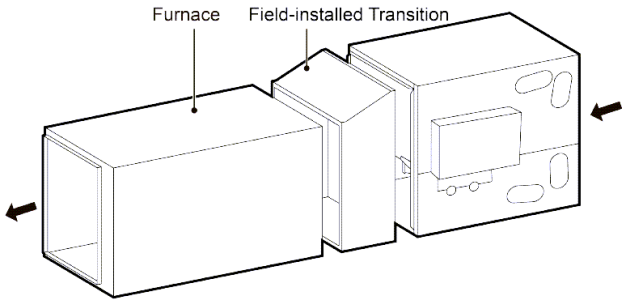


Figure 8. Counter flow (right hand shown, left hand similar but not shown)

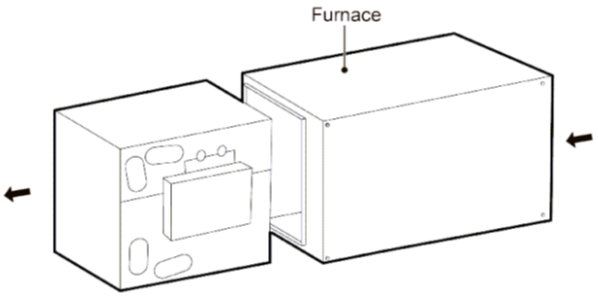
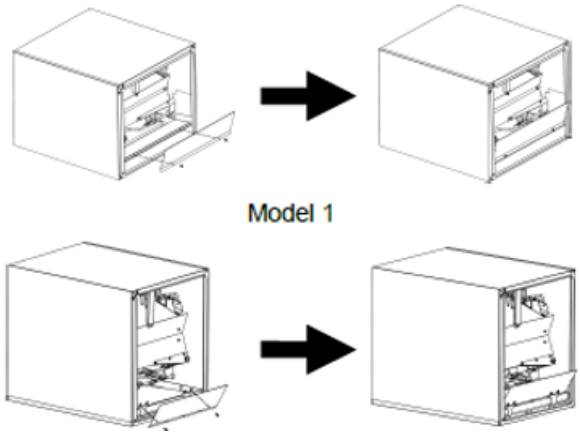


Figure 9. Coil baffle



Note: *Baffle is included with unit accessories and is required when installing the coil in a horizontal position. Installation locations are shown above.*

Figure 10. Upward flow

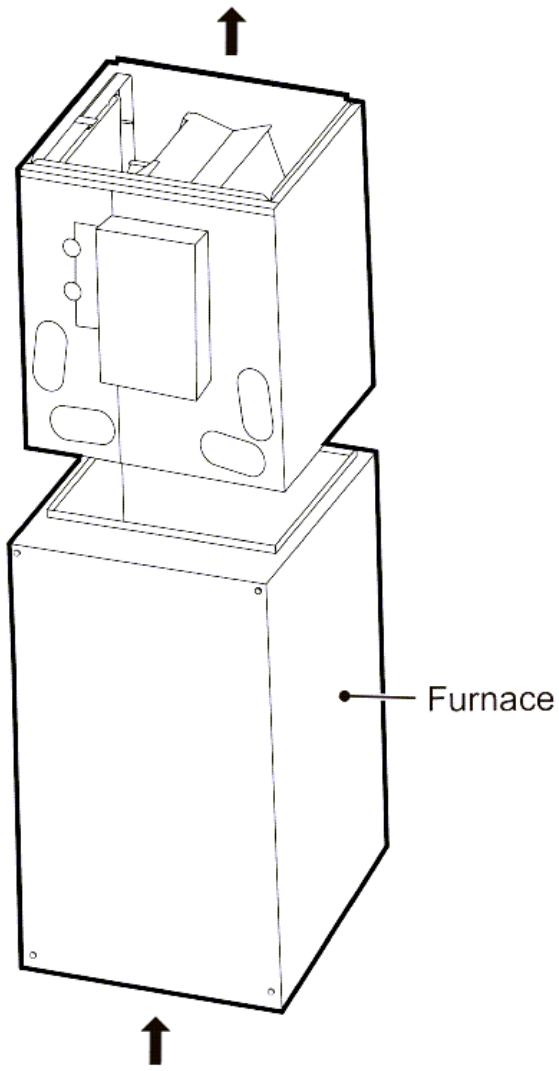
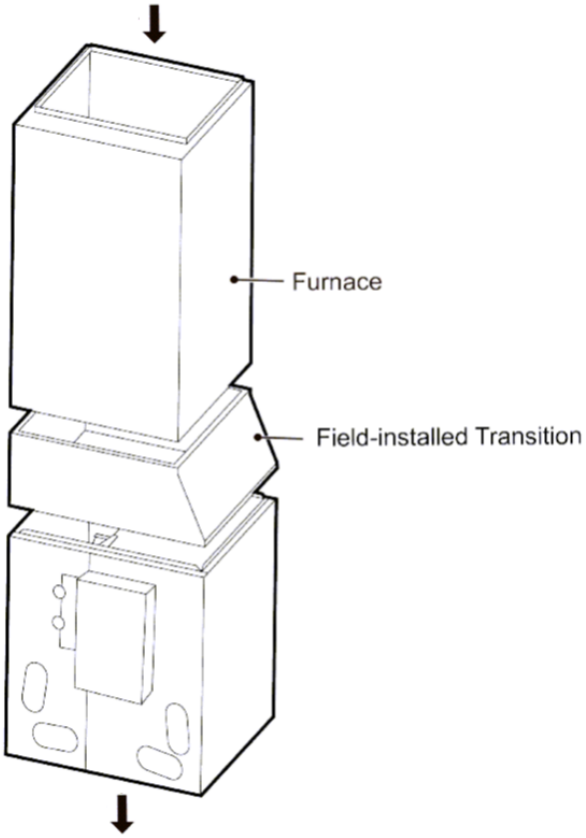


Figure 11. Downward flow



NOTICE

Equipment Damage!

Failure to follow instructions below could result in equipment damage.

A field transition must be used at all times in downflow applications to protect the components from excessive heat damage.

If the air inlet of blower is different with the air outlet of coil in size, it may be necessary to install a field-installed transition between the blower and the coil to proper airflow distribution (as shown in Figure 7, p. 10 and Figure 10, p. 11.

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

To avoid condensate water leakage, install the unit with an external drain pan and check the drain of the unit regularly.

When the downward flow installation method is used. The indoor ambient temperature sensor of the unit needs to be moved to the return side, and air outlet temperature sensor needs to be moved to the supply side. Otherwise, the unit may operate abnormally.

Refrigerant Charge

Table 3. Minimum conditioned space

No.	Refrigerant Charge (lbs)	Minimum Conditioned Space (m^2)	Minimum Conditioned Space (ft^2)
1	6.62	9.2	99.0
2	7.06	9.8	105.5
3	8.16	11.4	122.7
4	8.60	12.0	129.2
5	10.14	14.1	151.8
6	11.25	15.7	169.0
7	13.23	18.5	199.1

Table 4. Altitude adjustment

Altitude Ft. (Meters)	0 (0)	656 (200)	1312 (400)	1969 (600)	2625 (800)	3281 (1000)	3937 (1200)	4593 (1400)	5250 (1600)
AF	1.00	1.00	1.0	1.00	1.02	1.05	1.07	1.10	1.12
Altitude Ft. (Meters)	5252 (1600)	5906 (1800)	6562 (2000)	7218 (2200)	7874 (2400)	8531 (2600)	9187 (2800)	9843 (3000)	10499 (3200)
AF	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.40

Notes:

1. Based on w/nominal tonnage, dry coil, and filter should be installed.
2. This manual is only applicable to a single room.
3. 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.
4. When leakage is detected, the outdoor unit containing the compressor must stop operating. 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.

Table 5. Minimum airflow

Model	Minimum Airflow
5DXCB003AC3HCA 5DXCB005AC3HCA	517 CFM
5DXCD008AC3HCA 5DXCD010AC3HCA	609 CFM

⚠ WARNING

Leak Detection System Installed!

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

The unit is equipped with electrically powered safety measures and must be powered at all times after installation, except during servicing, to detect any leak.

Piping

Table 6. Connection pipe diameter

Model	External diameter	
	Gas pipe	Liquid pipe
5DXCB003AC3HCA	Ø 3/4 in.	Ø 3/8 in.
5DXCB005AC3HCA		
5DXCD008AC3HCA		
5DXCD010AC3HCA		

Figure 12. Piping preparation

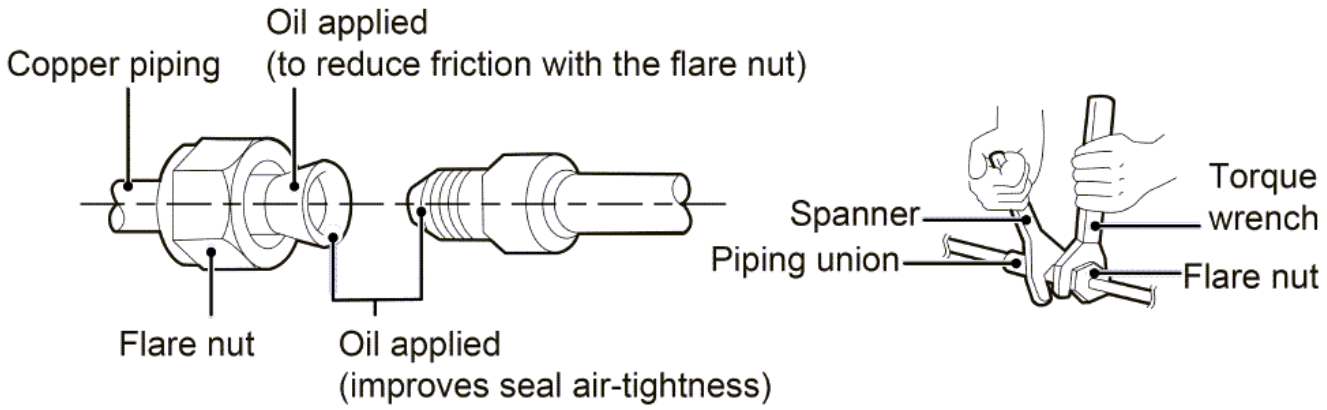


Table 7. Tightening torque

Pipe diameter (inch)	Tightening torque (lb-ft)
Ø 3/8	25–30
Ø 3/4	51–55

Electrical Installation

Electrical Requirements

⚠ WARNING

Electrical Hazard!

Failure to follow instructions below could result in death or serious injury, and property damage.

- **The electric circuit must be equipped with a circuit breaker and an air switch with sufficient capacity.**
- **Use a specialized power circuit for the air conditioner. Do not draw power from another power circuit.**
- **Locate the air conditioner at least 4.9 ft away from flammable surfaces.**
- **Confirm external power cords, thermostat wires, and the thermostat do not come into direct contact with hot objects (such as chimney pipes or warm gas pipes). They must also avoid intersecting metal beams, the edge of the ceiling, or touching any metal burrs, or sharp metal edges.**
- **Do not pull, stretch, or bend the wires.**
- **Refer to the circuit diagram on the unit or the electrical box to connect wires correctly.**
- **Tighten all screws.**
- **Firmly connect the wiring to the terminal board.**
- **After completing the electrical installation, secure the power cords and thermostat wires with wire clamps. Do not clamp wires too tightly.**
- **Replace damaged power cords by specialized wires.**

⚠ WARNING

Electrical Shock Hazard!

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

Always turn off all power to the unit before installing or servicing the unit. There may be more than one disconnect switch. Lock out and tag switch with a suitable warning label.

⚠ WARNING

Safety Hazard!

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

All phases of the installation must conform to NATIONAL, STATE, AND LOCAL CODES. For additional information, please contact your local distributor.

Table 8. Electrical parameters

Model	Power Supply
5DXCB003AC3HCA	24V to 1Ph 60Hz
5DXCB005AC3HCA	
5DXCD008AC3HCA	
5DXCD010AC3HCA	

- Install a circuit breaker at every power terminal near the units (indoor unit and thermostat) with at least 1/10th of an inch contact gap. The units must be able to be plugged or unplugged.
- The circuit breaker specifications are based on a working condition where the working temperature is 104° F. If working condition changes, adjust the specifications according to national standards.
- Use 5pc of AWG18 power cords to be the communication cords between indoor unit, thermostat, and furnace. The maximum length is 98 ft. Select a proper length according to local conditions. Communication cords must not be twisted together.

Wiring the leak detection sensor or system to the furnace assembly

- The wiring shall be not less than 18 AWG.
- Critical-to-safety wiring is any field installed wiring necessary to fulfill the requirements in the event of a leak detection.

Continuous air circulation is required for proper functionality. The unit must be powered except for service.

All wires must go through the insulation tube.

Connection of Power Cords and Communication Wires

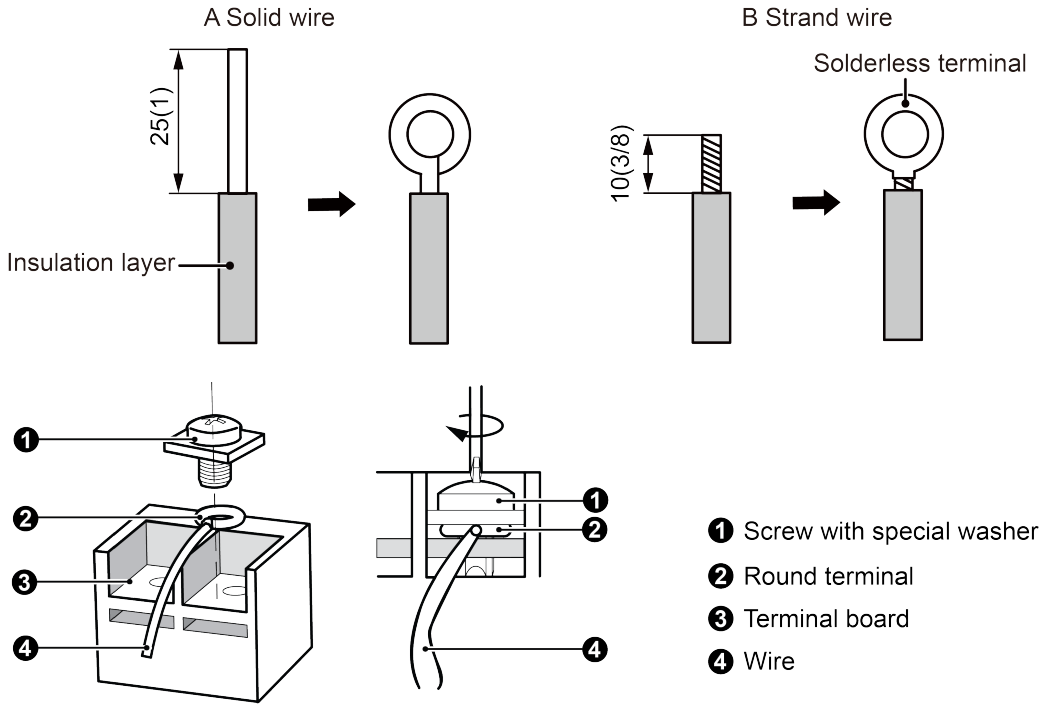
For solid wires (as shown below):

1. Use wire cutters to cut off the wire end and then peel away up to 0.5 to 1 inch of the insulation layer.
2. Use a screwdriver to unscrew the terminal screw on the terminal board.
3. Use wire clippers 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.

For strand wires (as shown below):

1. Use wire cutters to cut off the wire end and then peel away up to 0.4 inch 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.

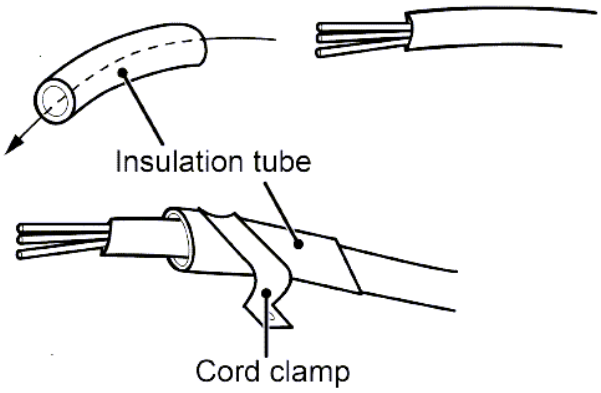
Figure 13. Connect power cords and communication wires



Connect communication wires and power cords:

- Lead the thermostat wires and power cords through the insulation tube .
- Secure the wires with wire clamps.

Figure 14. Insulation tube



⚠ WARNING

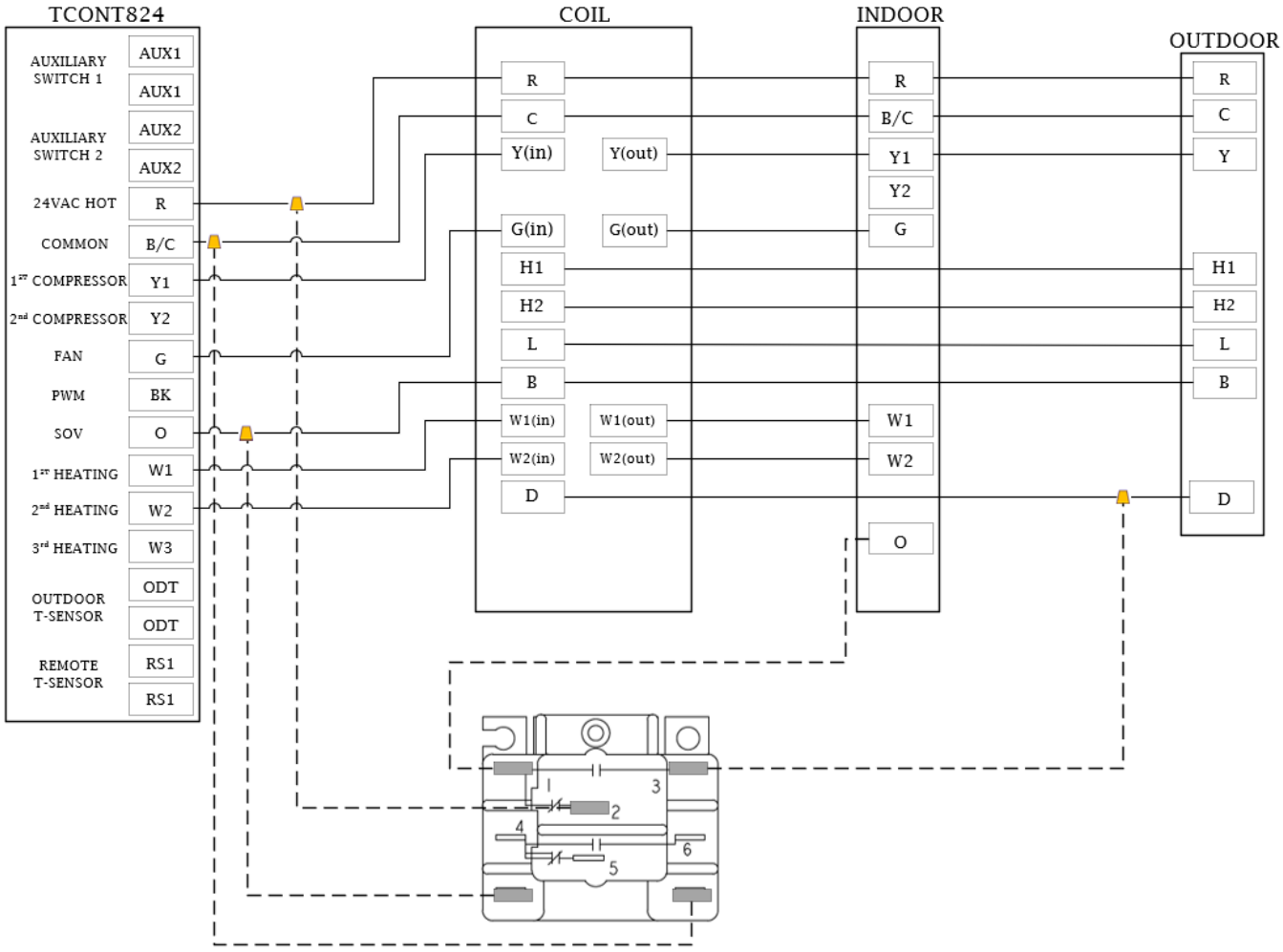
Electrical and Fire Hazard!

Failure to follow instructions below could result in death or serious injury, and property damage.

- **Confirm the indoor unit and thermostat are powered on.**
- **Match terminal numbers and wire colors with those indicated in the indoor unit to avoid burning electrical components.**
- **Connect wires firmly to the wiring box to prevent fire hazards.**
- **Confirm the ground wire is connected.**

Wiring Diagram

Figure 15. Field wiring (S9V2 wiring example)



Notes:

- *If using "O", the relay must be wired as shown.*
- *H1/H2 wiring is for communicating control which is recommended for optimal system performance. The outdoor unit must be configured by dip switch for operation mode.*
- *H1/H2 wiring requires 18 AWG stranded shielded wiring.*

Dip Switch Configuration

The control board has four dip switches (SA1) that control the unit.

Figure 16. Dip switch

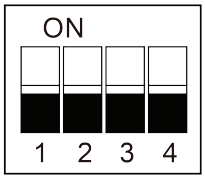


Table 9. Dip switch descriptions

Dip switch position	Description
1	ON: 24 V connection OFF: RS485 communication connection (default)
2	Default is OFF. Do not adjust.
3	Default is OFF. Do not adjust.
4	Factory-set capacity.

Sealing Ducts

- Use fiberglass sealing strips, caulking, or equivalent sealing method between the plenum and the coil unit to ensure a tight seal.
- Confirm 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.
- Seal ducts with sponge or other thermal insulation material where around the cut-off valves to prevent air leakage or water seepage.
- Paste sponge seal around the air outlet to prevent leakage.

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 below.

Table 10. Airflow

Model	Rated airflow (CFM)	Max airflow water management - all orientations (CFM)
5DXCB003AC3HCA	600	1000
5DXCB005AC3HCA	800	1000
5DXCD008AC3HCA	1100	1310
5DXCD010CA3HCA	1200	1310

Notes:

1. If 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.

3. Water blow-off could occur in certain installation positions if the airflow setting exceeds the maximum values listed above.

Table 11. Static pressure (in. W.C.)

Model	0.12	0.18	0.23	0.3
5DXCB003*	450	600	800	850
5DXCB005*	-	600	800	850
5DXCD008*	825	900	1100	1200
5DXCD010*	-	900	1100	1200

Note: Air flow (CFM) at different static pressures.

Troubleshooting and Maintenance

Error Codes

Table 12. Error codes

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 occur at the same time, error codes will show on the display repeatedly.*

Maintenance

Regular inspection and maintenance should be performed by a professional to prolong the unit life span.

Drain Pipe

Regularly check the drainage pipe for clogs to confirm that condensate water can drain.

Seasonal Maintenance

At the beginning of the season:

- Check if the air inlet/outlet of the units are blocked.
- Check if the filter screen is properly installed.
- Check if the unit is correctly installed. Contact your local dealer if repairs are necessary.

At the end of the season:

- Clean and dust the indoor unit.
- If the unit is rusty, coat with paint to prevent rust from spreading.

Obtain replacement parts from the manufacturer.

Servicing

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to minimize ignition risk. For repair to the refrigerating system, complete the following before beginning work:

- **Work procedure** — Use a controlled environment to minimize the risk of flammable gas or vapor being present during servicing.
- **General work area** — Inform all maintenance staff and others working in the local area of the nature of work being carried out. Avoid work in confined spaces.
- **Check for refrigerant** — Use an appropriate refrigerant detector prior to and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Confirm that the leak detection equipment used is suitable for all applicable refrigerants (non-sparking, adequately sealed, or intrinsically safe).
- **Fire extinguisher** — If any hot work is to be conducted on the refrigerating equipment or any associated parts, confirm appropriate fire extinguishing equipment is. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
- **No ignition sources** — Do not use any source of ignition that may lead to fire or explosion. Keep all possible ignition sources, including cigarettes, far away from the site of installation, repair, removal and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the confirm there are no flammable hazards or ignition risks in the area around the equipment. “No Smoking” signs shall be displayed.
- **Ventilation** — Confirm that the area is adequately ventilated before beginning work or conducting any hot work. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Refrigerant Equipment

Confirm the following when 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 circuit shall be checked for the presence of refrigerant.
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall 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.

Electrical Devices

Perform initial and ongoing safety checks of electrical components. If an issue exists that could compromise safety, do not connect any electrical supply o the circuit until it is resolved. If the error cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution can be used. Report all issues o the owner of the equipment.

Initial safety checks include:

- Capacitors are discharged; this shall be done in a safe manner to avoid possibility of sparking.
- That no live electrical components and wiring are exposed while charging, recovering, or purging the system.
- That there is continuity of earth grounding.

Electrical Safety

Do not alter casing on electrical components in such a way that the level of protection is impacted. This includes damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, and incorrect fitting of glands.

Confirm that apparatus is mounted securely.

Confirm that seals or sealing materials have not degraded and are ineffective. Replacement parts shall be in accordance with the manufacturer’s specifications.

Important:

- *The use of silicon sealant may inhibit the effectiveness of some types of leak detection equipment.*
- *Intrinsically safe components do not have to be isolated prior to working on them.*

Pipe Installation

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.

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.

Repairs to Sealed Components

Sealed electrical components must be replaced.

Repair to Intrinsically Safe Components

Do not apply any permanent inductive or capacitance loads to the circuit without confirming that it will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. Confirm the testing devices is at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

Cabling

Check that cabling is not showing signs of wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. Take into account the effects of ageing or continual vibration from sources such as compressors or fans.

Detection of Flammable Refrigerants

Under no circumstances should 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) can not be used.

The following leak detection methods are 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.) Confirm 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.

Examples of leak detection fluids are:

- Bubble method
- Fluorescent method agents

If a leak is suspected, all open 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 and Evacuation

When opening the refrigerant circuit to make repair, or for any other purpose, conventional procedures shall be used. Recover the refrigerant charge 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:

1. Safely remove refrigerant following local and national regulations.
2. Evacuate.
3. Purge the circuit with inert gas (optional for A2L).
4. Evacuate (optional for A2L).
5. Continuously flush or purge with inert gas when using flame to open circuit.
6. Open the circuit.

Do no use compressed air or oxygen for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging is 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.

Charging Procedures

In addition to conventional charging procedures, the follow these requirements:

- Confirm that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Confirm that the refrigeration system is grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Use extreme care to not overfill the refrigeration system.
- Prior to recharging the system, pressure test it with OFN. 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

Decommissioning

A technician familiar with the equipment should perform this procedure. Before decommissioning, take an oil and refrigerant sample in case analysis is required prior to reuse of reclaimed refrigerant. It is essential that the unit is powered before beginning decommissioning.

1. Become familiar with the equipment and its operation.
2. Isolate the system electrically.
3. Before attempting the procedure confirm 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.

4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Confirm that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with manufacturer's instructions.
8. Do not overfill cylinders. (No more than 80% volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, confirm that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

11. Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

Labeling

Label equipment that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed.

Recovery

When removing refrigerant from a system, either for servicing or decommissioning, all refrigerants must be removed safely.

When transferring refrigerant into cylinders, confirm that only appropriate refrigerant recovery cylinders are used. Confirm that the correct number of cylinders for holding the total system charge are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (special cylinders for the recovery of refrigerant).

Cylinders need to have a pressure relief valve and associated shut-off valves in good working order.

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. Before using the recovery machine, check that it is in satisfactory working order and has been properly maintained. Consult the manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant Waste Transfer Notice arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, confirm that they have been evacuated to an acceptable level and that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers.

Any quality or other issues encountered in the purchased air conditioner, please contact the local after-sales service department.

Notes

About Trane and American Standard Heating and Air Conditioning

Trane and American Standard create comfortable, energy efficient indoor environments for residential applications. For more information, please visit www.trane.com or www.americanstandardair.com.

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