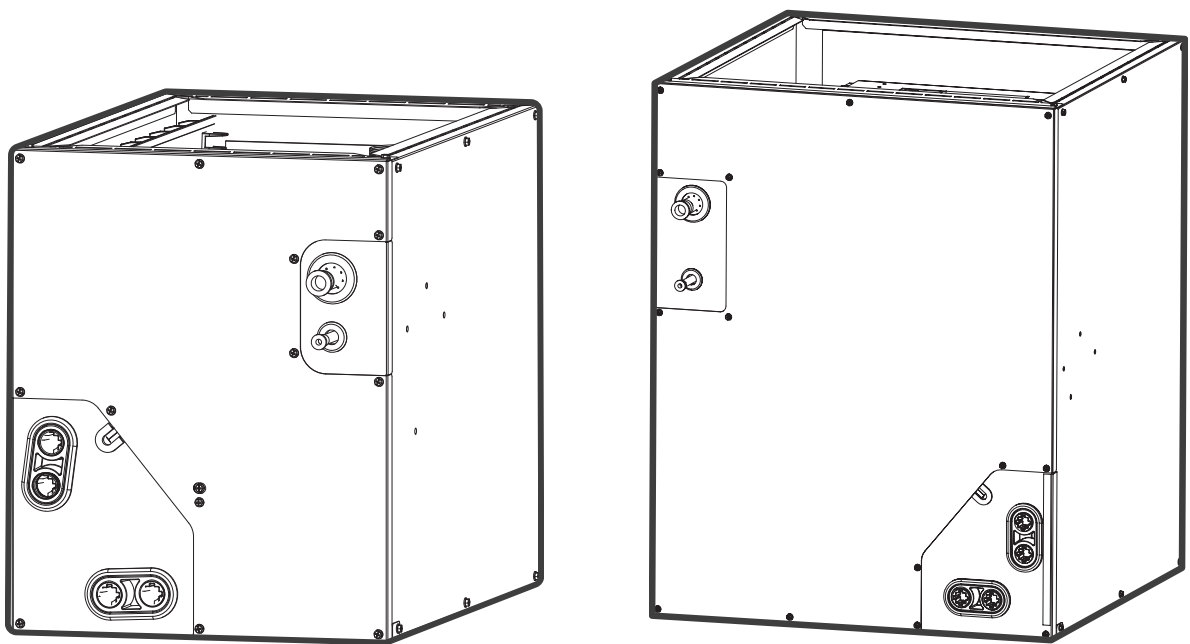


INSTALLATION MANUAL**EVAPORATOR COIL 18K – 60K BTU**

DRUC2414S2A, DRUC2417S2A, DRUC3614S2A, DRUC3617S2A,
DRUC3621S2A, DRUC6021S2A, DRUC6024S2A

R-454B, 24V / RS485 Communicating, 1ph 60HZ



Model Number:

Serial Number:

Purchase Date:

Installing Contractor Company Name:

**TIP**

Capture relevant information about your Durastar mini-split equipment before it is installed and write it above for future reference.

TABLE OF CONTENTS

INTRODUCTION	3
SYMBOLS USED IN THIS MANUAL.....	3
IMPORTANT SAFETY PRECAUTIONS	4
AIR FLOW LIMITATIONS	16
AIR FLOW PRESSURE DROP TABLE	17
ACCESSORIES.....	18
OPERATING TEMPERATURES.....	19
UNIT DIMENSIONS	20
SYSTEM PARTS IDENTIFICATION	21
COIL PARTS IDENTIFICATION.....	22
INSTALLATION PREPARATION.....	24
COIL INSTALLATION ON THE FURNACE	27
DUCT REQUIREMENTS	28
CONDENSATE DRAIN LINE CONNECTION.....	30
REFRIGERANT PIPING CONNECTION.....	31
LINE SET CONNECTION	32
COIL INTERFACE INSTALLATION	34
WIRING PRECAUTIONS	35
INTERFACE SENSOR CONNECTIONS.....	36
WIRING OVERVIEW	37
INDOOR UNIT WIRING	38
COIL INTERFACE 24V CONTROL LOGIC	42
EXPLANATION OF FURNACE CONNECTIONS	43
ELECTRICAL RATINGS.....	44
DIP SWITCH DEFINITIONS.....	45
WIRING DIAGRAM.....	46
CONNECTOR AND SWITCH POSITIONS	47
24V SIGNAL CHART (COOLING & HEATING).....	48
24V SIGNAL CHART (COOLING ONLY)	49
OPTIONAL SWITCHES AND FUNCTIONS.....	50
FINAL CHECKS.....	51
TEST RUN	52
TROUBLESHOOTING.....	53
ERROR AND OPERATING CODES.....	56

INTRODUCTION

To better serve you, please do the following before contacting customer service:

- If you received a damaged product, immediately contact the retailer or dealer that sold you the product.
- Read and follow this manual carefully for proper installation and maintenance the coil
- Read the troubleshooting section of this manual as it will help you diagnose and solve common issues.
- Visit us on the web at www.durastar.com to download product guides and up-to-date information.
- If you need warranty service, our friendly customer service representatives are available via email at questions@durastar.com or by telephone at 1-888-320-0706.

SYMBOLS USED IN THIS MANUAL



WARNING: The warning symbol indicates personal injury or loss of life is possible. Extra care and precautions should be taken to ensure the user's safety.



CAUTION: The caution symbol indicates property damage or other serious consequences could occur.



NOTE: The pencil indicates any manufacturer notes relating to surrounding content. These may include further clarifications or call-outs.



TIP: A light bulb symbol indicates suggested manufacturer tips for the user to get the most out of the Durastar equipment and to accommodate the best user experience.



Refrigerant
Safety Group
A2L

WARNING:

RISK OF FIRE DUE TO FLAMMABLE MATERIALS
Follow handling instructions carefully in compliance with national regulations.

Explanation of symbols displayed on the unit

	CAUTION	This symbol shows that the operation manual should be read carefully.
	CAUTION	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	CAUTION	This symbol shows that information is available such as the operating manual or installation manual.

**WARNING**

Turn off the coil and disconnect the power before installing, cleaning, or repairing the coil. Failure to do so can cause electric shock.

IMPORTANT SAFETY PRECAUTIONS

Improper handling can cause serious damage or injury. Please read the following safety information in its entirety.



Warnings for Product Use

- This coil 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 coil by a person responsible for their safety. Children should be supervised to ensure that they do not play with the coil.
- If an abnormal situation arises (like a burning smell), immediately turn off the unit and disconnect the power. Call your dealer for instructions to avoid electric shock, fire or injury.
- Do not insert fingers, rods or other objects into the air inlet or outlet. This may cause injury, since the fan may be rotating at high speeds.
- Do not use flammable sprays such as hair spray, lacquer or paint near the unit. This may cause fire or combustion.
- Do not operate the coil in places near or around combustible gases. Emitted gas may collect around the unit and cause explosion.
- Do not operate your coil in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.
- Do not expose your body directly to cool air for a prolonged period of time.
- If the coil is used together with burners or other heating devices, thoroughly ventilate the room to avoid oxygen deficiency.
- In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed coil units is highly recommended.



Warnings for Product Installation

- Turn off the coil and disconnect the power before performing any installation or repairs. Failure to do so can cause electric shock.
- Installation must be performed by an authorized dealer or specialist according to the installation instructions. Improper installation can cause water damage, electrical hazard or fire. Contact an authorized service technician for repair or maintenance.
- This coil shall be installed in accordance with national wiring regulations.
- Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
- Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.
- Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property.
- Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.
- Do not turn on the power until all work has been completed.

- When moving or relocating the coil, consult experienced service technicians for disconnection and re-installation of the unit.
- For instruction on how to install the coil to its support, please thoroughly read and follow both the indoor and outdoor installation manuals.



Electrical Warnings

- The power supply of the Mini Interface must meet the requirements of safety isolation.
- Before obtaining access to terminals, all supply circuits must be disconnected.
- Risk of electric shock. Can cause injury or death. Disconnect all remote electric power supplies before servicing.
- The electronic control board only provides control signals and does not drive high-power loads. The external load power cannot exceed 15W.
- Only use the specified wire. If the wire is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The product must be properly grounded at the time of installation, or electric shock may occur.
- For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock. All electrical connections must be made according to the Electrical Wiring Diagram located on the panels of the indoor and outdoor units.
- All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electric shock.
- Do not share the electrical circuit with other coils. Improper or insufficient power supply can cause fire or electric shock.
- If connecting power to fixed wiring, an all-pole disconnection device should be incorporated in the fixed wiring in accordance with the electrical local code.



Warnings for Cleaning and Maintenance

- Turn off the device and disconnect the power before cleaning. Failure to do so can cause electric shock.
- Do not clean the coil with excessive amounts of water.
- Do not clean the coil with combustible cleaning agents. Combustible cleaning agents can cause fire or deformation.



CAUTIONS

- Turn off and unplug the unit during storms.
- Make sure that water condensation can drain unhindered from the unit.
- Do not operate the coil with wet hands. This may cause electric shock.
- Do not use device for any other purpose than its intended use.
- Do not climb onto or place objects on top of the outdoor unit.
- Do not allow the coil to operate for long periods of time with doors or windows open, or if the humidity is very high.

**WARNING: REFRIGERANT SAFETY (A2L)**

- This system operates with R-454B refrigerant classified as an A2L where the 2L stands for a lower flammability. Air and R-454B should never be stored in tanks or allowed to accumulate.
- Do not pierce refrigerant lines or burn.
- Be aware that flammable refrigerants may not contain an odor.
- Compliance with national refrigerant regulations shall be observed.
- All joints made in the installation between parts of the REFRIGERATION SYSTEM shall be made with a brazed, welded, or mechanical connection before opening the valves to permit refrigerant to flow between the REFRIGERATION SYSTEM parts.
- The minimum average fan airflow velocity is no less than 1,0 m/s (200ft/min).
- The refrigerant detection system shall de-energize the heat source when a leak is detected
- The control system for coil shall be provided with a fan interlock designed to prevent operation of the heat pump unless the circulating fan is energized and preventing simultaneous operation of the heat pump and the installed fossil fuel furnace.
- R-410A or R-22 systems should not be retrofit with R-454B.
- Do not use means to accelerate the defrosting process or to clean the unit, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

**A2L REFRIGERANT SAFETY PRECAUTIONS****1. Installation (Where Refrigerant Pipes Are Allowed)**

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- That the installation of pipe-work shall be kept to a minimum.
- That pipe-work shall be protected from physical damage.
- Where refrigerant pipes shall be compliance with national gas regulations.
- That mechanical connections shall be accessible for maintenance purposes.
- Be more careful that foreign matter(oil, water,etc) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc.
- All working procedure that affects safety means shall only be carried by competent persons.
- Coil shall be stored in a well ventilated area where the room size corresponds to the room area as specific for operation.
- Joints shall be tested with detection equipment with a capability of 0.18 oz (5 g) per year of refrigerant or better, with the equipment in standstill and under operation or under a pressure

of at least these standstill or operation conditions after installation. Detachable joints shall NOT be used in the indoor side of the unit (brazed, welded joint could be used).

- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.

LEAK DETECTION SYSTEM installed. Unit must be powered except for service. For the unit with refrigerant sensor, when the refrigerant sensor detects refrigerant leakage, the indoor unit will display a error code and emit a buzzing sound, the compressor of outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code "FHCC". The refrigerant sensor can not be repaired and can only be replaced by the manufacturer. It shall only be replaced with the sensor specified by the manufacturer.

2. Because a FLAMMABLE REFRIGERANT is used, the requirements for installation space of coil and/or ventilation requirements are determined according to:

- the mass charge amount(M) used in the coil,
- the installation location,
- the type of ventilation of the location or of the coil.
- 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, 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 protection devices, piping, and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;
- that piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;
- that steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;
- that precautions shall be taken to avoid excessive vibration or pulsation;
- the minimum floor area of the room shall be mentioned in the form of a table or a single figure without reference to a formula;
- After completion of field piping for split systems, the field pipework shall be pressure tested with OXYGEN-FREE NITROGEN (OFN) and then vacuum tested prior to refrigerant charging, according to the following requirements:
 1. Pressure test the refrigerant piping to 500 PSI.
 2. The test pressure after removal of pressure source shall be maintained for at least 1 hour with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
 3. During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump and the pressure shall not rise above 1500 microns within 10 min. The vacuum pressure level shall be specified in the manual, and shall be the lessor of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial, and industrial buildings.
- Field-made refrigerant joints indoors shall be tightness tested according to the following requirements: The test method shall have a sensitivity of 0.18 oz (5 g) per year of refrigerant or better under a pressure of at least 125% of the maximum allowable pressure. No leak shall be detected.

3 . Qualifications Of Workers

Any maintenance, service and repair operations must be performed by qualified personnel. Any working procedure that impacts safety must be performed only by qualified individuals who have completed the necessary training and obtained certification to demonstrate their competence. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. All training shall follow the ANNEX HH requirements of UL 60335-2-40 4th Edition.

Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

4. 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 minimized. For repair to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

5. Work Procedure

Works shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

6. General Work Area

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

7. 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 flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. no sparking, adequately sealed or intrinsically safe.

8. Presence Of Fire Extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry power or CO2 fire extinguisher adjacent to the charging area.

9. 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.

10. Ventilated Area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any work that could produce ignition. Keep ventilation openings clear of obstruction. Ventilation continue during the period that the work is carried out. Proper ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

11. Checks To The Refrigeration 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:

- the actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuits shall be checked for the presence of refrigerant;
- marking to the equipment continues to be visible and legible, marking 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.

12. 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, and 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:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that there no live electrical components and wiring are exposed while charging, recovering or purging the system;
- that there is continuity of earth bonding;
- Sealed electrical components shall be replaced if it's damage;
- Intrinsically safe components must be replaced if it's damage.

13. Wiring

Check that wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

14. 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 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 bubble method and 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. See the following instructions for removal of refrigerant.

15. 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:

- safely remove refrigerant following local and national regulations; evacuate;
- purge the circuit with NITROGEN
- evacuate (requirement);
- continuously flush or purge with NITROGEN when using flame to open circuit; and
- open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For coils containing flammable refrigerants, the system shall be purged with OXYGEN-FREE NITROGEN (OFN) to render the coil safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen **shall not be used** for purging refrigerant systems.

For coils containing flammable refrigerants, refrigerant purging shall be achieved by breaking the vacuum in the system with OXYGEN-FREE NITROGEN (OFN) and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (requirement). This process shall be repeated until no refrigerant is within the system (requirement). 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.

16. Charging Procedures

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

- Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants).

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OXYGEN FREE NITROGEN (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.

17. 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.

- Become familiar with the equipment and its operation.
- Isolate system electrically
- 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.
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.
- Do not overfill cylinders (no more than 80 % volume liquid charge)
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- 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.
- Recovered refrigerant shall not be charged into another refrigeration system unless it has been cleaned and checked.

18. Labeling

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

19. 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 labeled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment 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.

20. Unventilated Areas

- An unventilated area where the coil using FLAMMABLE REFRIGERANTS is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.
- If coils connected via an air duct system to one or more rooms with A2L REFRIGERANTS are installed in a room with an area less than A_{min} , that room shall be without continuously operating open flames (e.g. an operating gas coil) 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 active flame arrest.
- 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.
- Only auxiliary devices (such as certificated heater kit) approved by the coil manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.
- For duct connected coils, false ceilings or drop ceilings may be used as a return air plenum if a REFRIGERANT DETECTION SYSTEM is provided in the coil and any external connections are also provided with a sensor immediately below the return air plenum duct joint.
- REFRIGERANT SENSORS for REFRIGERANT DETECTION SYSTEMS shall only be replaced with sensors specified by the coil manufacture.
- LEAK DETECTION SYSTEM installed. Unit must be powered except for service.

21. Transportation, Marking and Storage for Units That Employ Flammable Refrigerants

The following information is provided for units that employ FLAMMABLE REFRIGERANTS

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.

Marking of equipment using signs: Signs for similar coils 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.

Disposal of equipment using flammable refrigerants: See national regulations.

Storage of equipment/coils: The storage of the coil should be in accordance with the applicable regulations or instructions, whichever is more stringent.

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.



Additional Precautions

- Turn off the coil and disconnect the power if you are not going to use it for a long time.
- Turn off the unit during electrical storms to avoid damaging the unit.
- Make sure that water condensation can drain unhindered from the unit.
- Do not operate the coil with wet hands. This may cause electric shock.
- Do not use this device for any other purpose than its intended use.
- Do not climb onto or place objects on top of the outdoor unit.
- Do not allow the coil to operate for long periods of time with doors or windows open, or if the humidity is very high.
- If the coil is used together with burners or other heating devices, thoroughly ventilate the room to avoid oxygen deficiency and carbon monoxide build up.
- In certain environments, such as kitchens, server rooms, etc., the use of specially designed coil units is highly recommended.
- 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.
- Excessive Weight Hazard – Use two (2) or more people when moving and installing the unit. Failure to do so can result in back or other type of injury.

Specifications of R-454B Refrigerant

- **Application:** R-454B is not a drop-in replacement for R-410A. The equipment design must accommodate the A2L safety group of R-454B. It cannot be used in R-410A systems.
- **Physical Properties:** R-454B has an atmospheric bubble point of -59.6 °F (-50.9 °C) and an atmospheric dew point of -58.0 °F (-50.0 °C). Its bubble point saturation pressure at 77 °F (25 °C) is 213 psig (1469 kPa) and dew point saturation pressure at 77 °F (25 °C) is 205 psig (1415 kPa).
- **Composition:** R-454B is classified as safety group A2L per ASHRAE Standard 34. Verify that service equipment and instruments are certified for use with group A2L refrigerants, and in particular with R-454B is a non-azeotropic mixture of 68.9% by weight difluoromethane (HFC-32) and 31.1 % by weight 2,3,3,3-tetrafluoro-1-propene (HFO-1234yf).

R454B REQUIRED MINIMUM ROOM AREA

Minimum Room Area

R454B UL guidelines mandate that refrigerant dissipation measures be implemented in the event of a leak, determined by the total area of the installation and the overall system charge. The total system charge includes any component that holds refrigerant, including line sets, indoor coils, and outdoor units. The ceiling height of the space cannot be less than 7.3ft/2.2m, and the minimum room area of operating or storage should be as specified in the following table:

TA_{min} : REQUIRED MINIMUM ROOM AREA: ft² (m²)

M _c or M _{REL} [oz/kg]	TA _{min} [ft ² /m ²]	M _c or M _{REL} [oz/kg]	TA _{min} [ft ² /m ²]	M _c or M _{REL} [oz/kg]	TA _{min} [ft ² /m ²]	M _c or M _{REL} [oz/kg]	TA _{min} [ft ² /m ²]
≤ 62.7/1.7	12/1.1	134/3.8	126/11.67	211.6/6.0	198/18.43	289.2/8.2	271/25.18
63.5/1.8	60/5.53	141.1/4	132/12.29	218.7/6.2	205/19.04	296.3/8.4	278/25.8
70.5/2	66/6.14	148.1/4.2	139/12.9	225.8/6.4	212/19.66	303.4/8.6	284/26.41
77.6/2.2	73/6.76	155.2/4.4	145/13.51	232.8/6.6	218/20.27	310.4/8.8	291/27.63
84.6/2.4	79/7.37	162.2/4.6	152/14.13	239.9/6.8	225/20.88	317.5/9.0	298/27.64
91.7/2.6	86/7.99	169.3/4.8	159/14.74	246.9/7.0	231/21.5	324.5/9.2	304/28.26
98.8/2.8	93/8.6	176.4/5	165/15.36	254/7.2	238/22.11	331.6/9.4	311/28.87
105.8/3	99/9.21	183.4/5.2	172/15.97	261/7.4	245/22.73	338.6/9.6	317/29.48
112.9/3.2	106/9.83	190.5/5.4	179/16.58	268.1/7.6	251/23.34	345.7/9.8	324/30.10
119.9/3.4	112/10.44	197.5/5.6	185/17.2	275.1/7.8	258/23.96	352.7/10.0	331/30.71
127/3.6	119/11.06	204.6/5.8	192/17.81	282.2/8.0	264/24.57		
Variable Definitions	TA_{min}: the required minimum room area in ft² (m²) M_c: the actual refrigerant charge in the system in lbs (kg) M_{REL}: the refrigerant releasable charge in lbs (kg) WARNING: The minimum room area or the minimum room area of conditioned space is based on releasable charge and total system refrigerant charge.						

MINIMUM FURNACE AIRFLOW BASED ON SYSTEM REFRIGERANT CHARGE

Please check the furnace you purchased. The minimum airflow of operating or storage should be as specified in the following table.

M_c [oz/kg]	QH_{min} [CFM/(m ³ /h)]	M_c [oz/kg]	QH_{min} [CFM/(m ³ /h)]	M_c [oz/kg]	QH_{min} [CFM/(m ³ /h)]
49.4/1.4	84/142	162.3/4.6	275/466	275.1/7.8	466/791
56.4/1.6	96/162	169.3/4.8	287/486	282.2/8.0	478/811
63.5/1.8	107/182	176.4/5.0	298/507	289.2/8.2	490/831
70.5/2.0	119/203	183.4/5.2	310/527	296.3/8.4	501/851
77.6/2.2	131/223	190.5/5.4	322/547	303.4/8.6	513/872
84.7/2.4	143/243	197.5/5.6	334/568	310.4/8.8	525/892
91.7/2.6	155/264	204.6/5.8	346/588	317.5/9.0	537/912
98.8/2.8	167/284	211.6/6.0	358/608	324.5/9.2	549/932
105.8/3	179/304	218.7/6.2	370/628	331.6/9.4	561/953
112.9/3.2	191/324	225.8/6.4	382/649	338.6/9.6	573/973
119.9/3.4	203/345	232.8/6.6	394/669	345.7/9.8	585/993
127/3.6	215/365	239.9/6.8	406/689	352.7/10.0	597/1014
134/3.8	227/385	246.9/7.0	418/709	36/10.2	609/1034
141.1/4.0	239/405	254/7.2	430/730	366.8/10.4	621/1054
148.2/4.2	251/426	261/7.4	442/750	373.9/10.6	633/1074
155.2/4.4	263/446	268.1/7.6	454/770	381/10.8	645/1095
Airflow Formula	QH_{min} is the required minimum airflow in CFM/ m³ /h M_c is the actual refrigerant charge in the system in oz/ kg WARNING: Minimum airflow is determined based on the releasable refrigerant charge and the total refrigerant charge of the system. Under full-load cooling conditions, the supply airflow shall not exceed 400 standard cubic feet per minute (SCFM) per ton of rated cooling capacity.				

TAKE NOTE OF THE FUSE SPECIFICATIONS

The coil's circuit board (PCB) is designed with a fuse to provide over-current protection. The specifications of the fuse are printed on the circuit board , for example : T3.15AL/250VAC, T5AL/250VAC, T3.15A/250VAC, T5A/250VAC, T20A/250VAC, T30A/250VAC,etc.



NOTE

Only a blast-proof ceramic fuse can be used.

AIRFLOW LIMITATIONS

Install the coil in accordance with the following approximate designed airflow limits:

COIL MODEL	COMPATIBLE OUTDOOR UNIT (TON)	MINIMUM (CFM)	MAXIMUM(CFM)
DRUC2414S2A	1-1/2	525	600
	2	700	800
DRUC2417S2A	1-1/2	525	600
	2	700	800
DRUC3614S2A	2-1/2	875	1000
	3	1050	1200
DRUC3617S2A	2-1/2	875	1000
	3	1050	1200
DRUC3621S2A	2-1/2	875	1000
	3	1050	1200
DRUC6021S2A	3-1/2 - 4	1400	1600
	5	1575	1800
DRUC6024S2A	3-1/2 - 4	1400	1600
	5	1575	1800

WARNING



When these coils are used with any furnace, the furnace must be equipped with blower failure detection and airflow verification. Blower feedback must shut the gas valve within one (1) minute of airflow loss. **These coils are not approved for use with Ultra Low NOx (ULN) furnaces.**

AIRFLOW PRESSURE DROP TABLE

COIL MODEL	PRESSURE DROP (in. w.c.) @ AIRFLOWS (SCFM) IN COOLING														
	0.10	0.16	0.20	0.26	0.30	0.34	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.68	0.72
DRUC2414S2A	486	640	720	848	919	1008	1075	/	/	/	/	/	/	/	/
DRUC2417S2A	496	671	769	916	998	1102	1178	/	/	/	/	/	/	/	/
DRUC3614S2A	489	639	719	827	889	1008	1159	/	/	/	/	/	/	/	/
DRUC3617S2A	499	670	768	895	968	1079	1215	/	/	/	/	/	/	/	/
DRUC3621S2A	509	701	817	964	1048	1150	1271	/	/	/	/	/	/	/	/
DRUC6021S2A	576	744	834	958	1037	1106	1206	1359	1425	1462	1499	1559	1635	1700	1768
DRUC6024S2A	535	728	812	976	1046	1091	1187	1341	1412	1429	1484	1518	1601	1671	1753

NOTE: Data based on wet coil with air inlet at 80 F DB/ 67 F WB without air filter.

NOTE

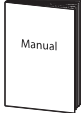
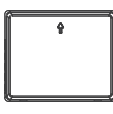
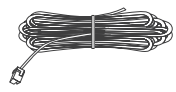


Gas furnace heating airflow (CFM) may exceed the design cooling airflow. Ductwork and coil selection must be sized for the greater of the cooling or heating CFM to avoid furnace limit trips, excessive noise, and coil freeze-up.

ACCESSORIES

INCLUDED INSTALLATION ACCESSORIES

The coil comes with the following accessories. These are usually packaged in the air outlet. Remove before install.

ACCESSORY	QUANTITY	IMAGE	ACCESSORY	QUANTITY	IMAGE
Manual	2		Room Temp. Sensor T1	1	
Coil Interface (PDRUCINT1)	1		Room Temp. Sensor Extension (5m)	1	
Coil Interface Screws M4*35	3		Coil Sensor Clamp	1	
Coil Interface Screws 5/8" M4*16	4		Cable Ties	1	
Coil Interface Anchors	3				

FIELD SUPPLIED INSTALLATION ACCESSORIES

The following installation accessories are required and must be purchased separately.

- Refrigerant piping (line set)
- Filter
- Indoor and outdoor connection wire
- Outdoor power supply cord
- Drain pipe
- Pipe and cable wrapping tape
- Wall hole sleeve and cover
- Putty
- Wiring u-lugs



WARNING

Ensure that all service equipment and instruments are certified for use with group A2L refrigerants, specifically R-454B. Recovery equipment, pumps, hoses, and related components must be rated for the appropriate design pressures for R-454B. Manifold sets should accommodate pressures up to 800 psig on the high side and 250 psig on the low side, with a 550 psig low-side retard. Hoses must have a service pressure rating of 800 psig, while recovery cylinders should be rated for 400 psig, meeting DOT 4BA400 or DOT 4BW400 standards.

TOOLS NEEDED

The following tools are required for installation.

- Vacuum pump
- HVAC manifold gauge set
- Micron Gauge
- Refrigerant leak detector
- Copper pipe cutter
- Phillips screwdriver
- Drill with 2 1/2" or 3 1/2" (indoor unit model depending) core bit
- Flaring tool
- Burr reamer
- Crescent or spanner wrench
- Hexagonal wrench set
- Torque wrench
- Multimeter
- Electro-probe
- Level
- Hammer
- Wire strippers
- Wire crimper
- Hand seamer

OPERATING TEMPERATURES

Your coil is designed to operate in the following indoor and outdoor temperatures. When your coil is used outside of the following temperature ranges, certain safety features may activate and turn off the unit to protect it from damage. We strongly suggest keeping the unit plugged in at all times when temperatures are below 32°F (0°C) for smooth operation.

TEMPERATURE RANGES

	COOL mode	HEAT mode	DRY mode
Indoor Air Temperature	60°F – 90°F (16°C – 32°C)	32°F – 86°F (0°C – 30°C)	50°F – 90°F (10°C – 32°C)
Outdoor Air Temperature	-13°F / -22°F* – 122°F (-25°C / -30°C* – 50°C)	-13°F / -22°F* – 75°F (-25°C / -30°C* – 24°C)	32°F – 122°F (0°C – 50°C)

* The minimum operating temperature depends on the outdoor unit. Low ambient Sirius Heat™ models have a minimum operating temperature in heat mode of -22°F (-30°C).

To further optimize the performance of your unit, do the following:

- Keep doors, windows, and curtains closed.
- Limit energy usage by using TIMER ON and TIMER OFF features on the DRSTAT102C.
- Do not set the unit to excessive temperature levels.
- Do not block air inlets or outlets.
- Regularly inspect and clean air filters.

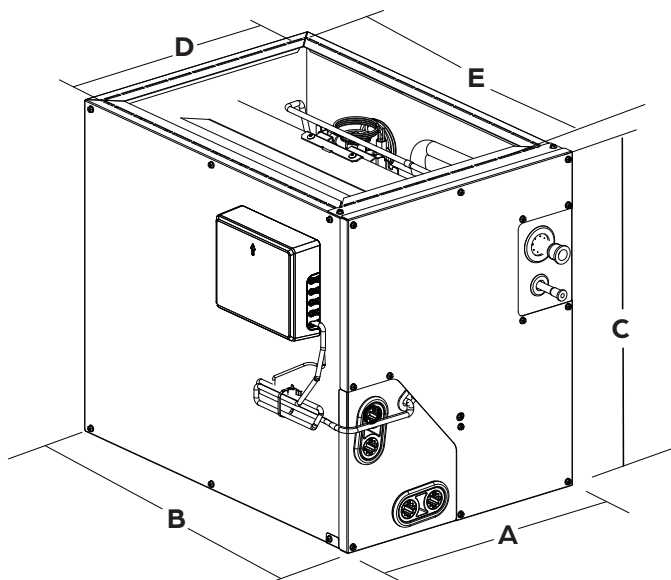
NOTE



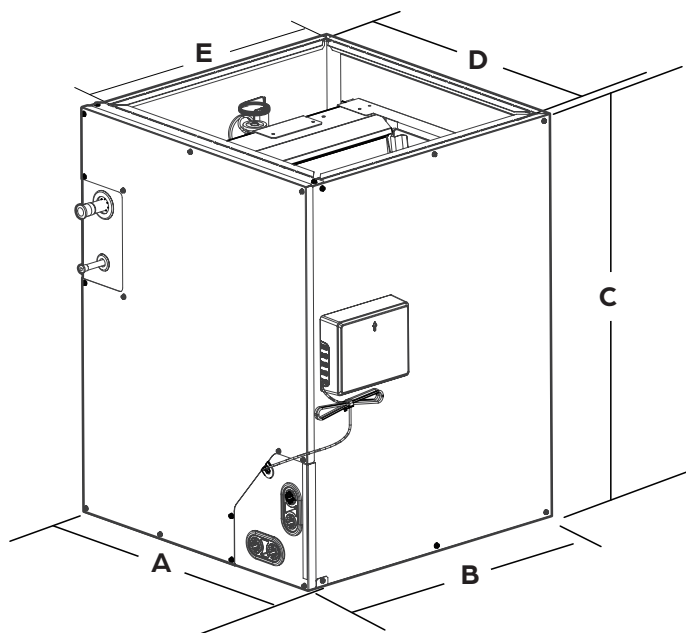
Keep the room's relative humidity below 80%. If the coil operates in excess of this, the surface of the coil may attract condensation. To help prevent condensation from forming and dripping, make sure the supply diffusers are open and not blocked.

UNIT DIMENSIONS

Most Models



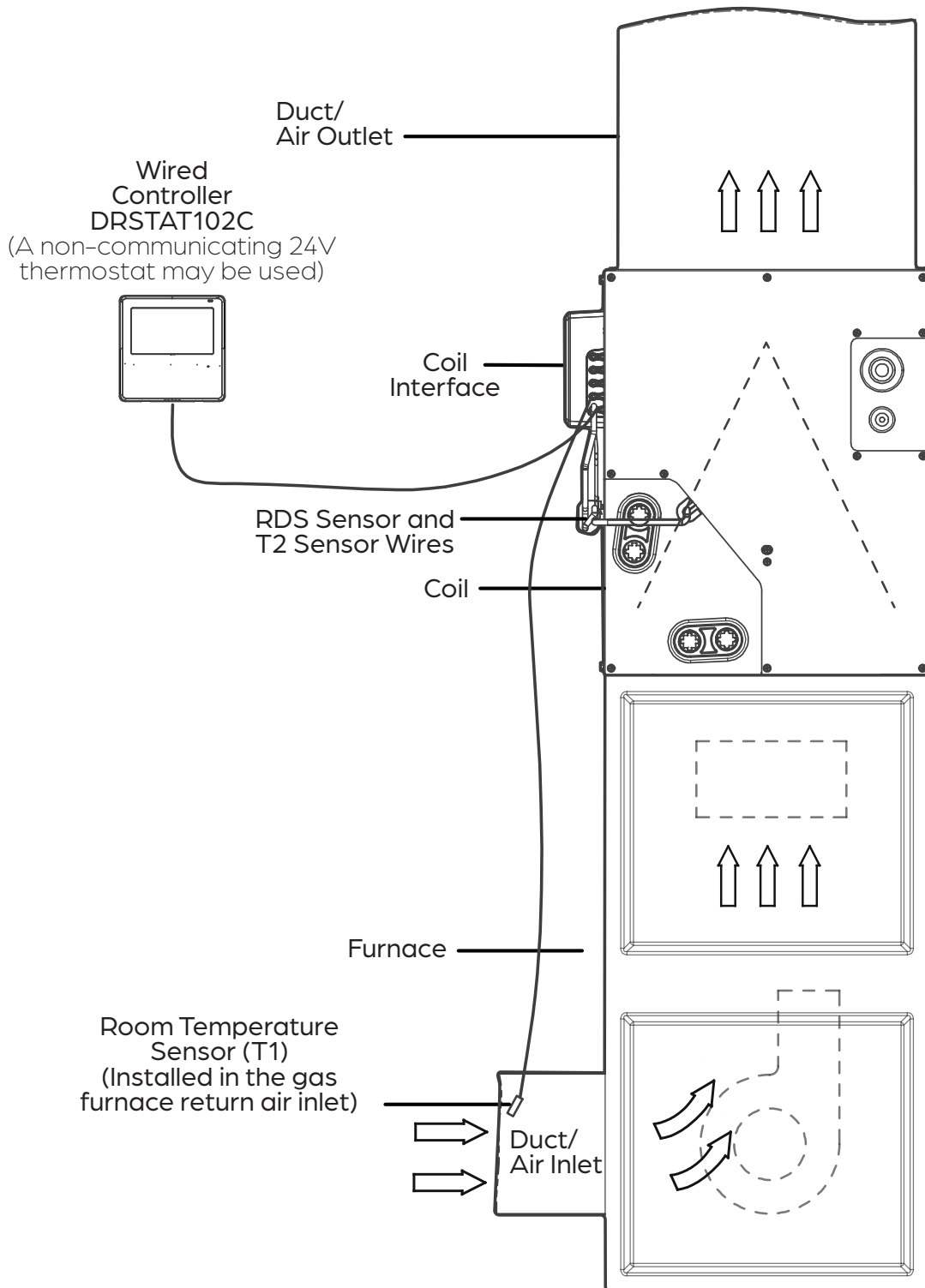
DRUC6021S2A



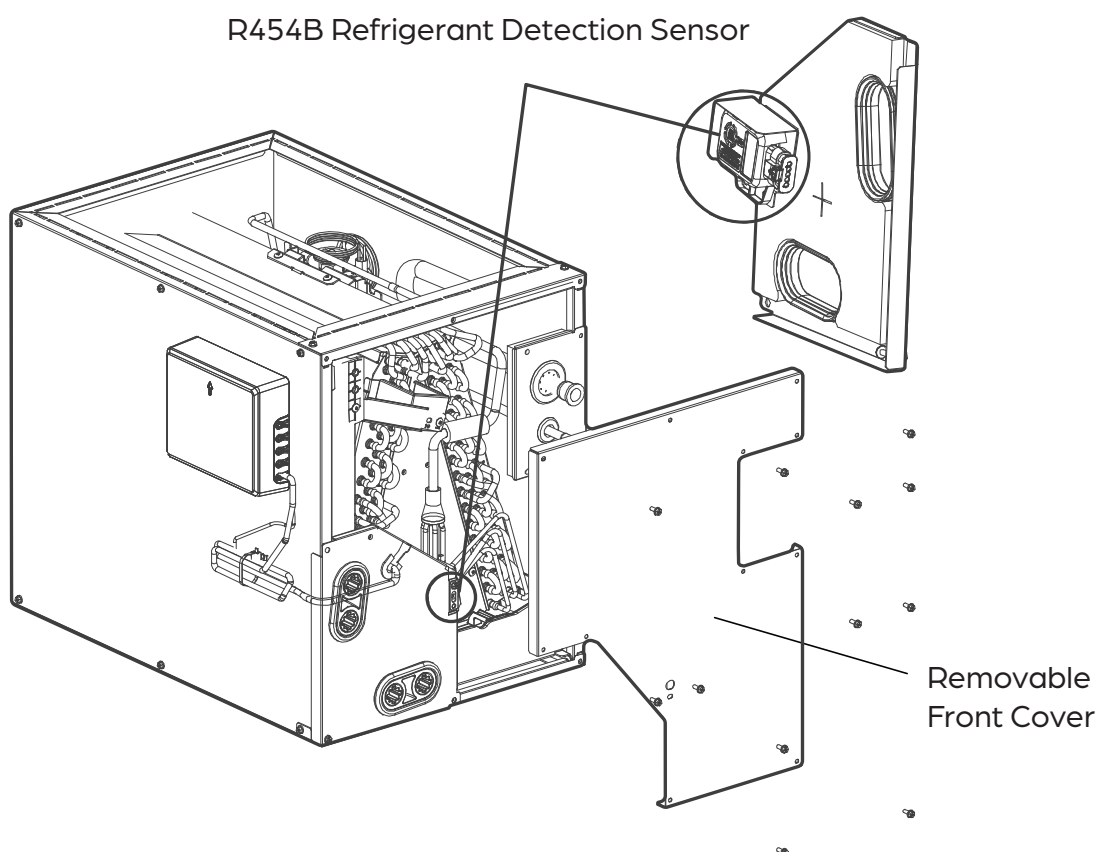
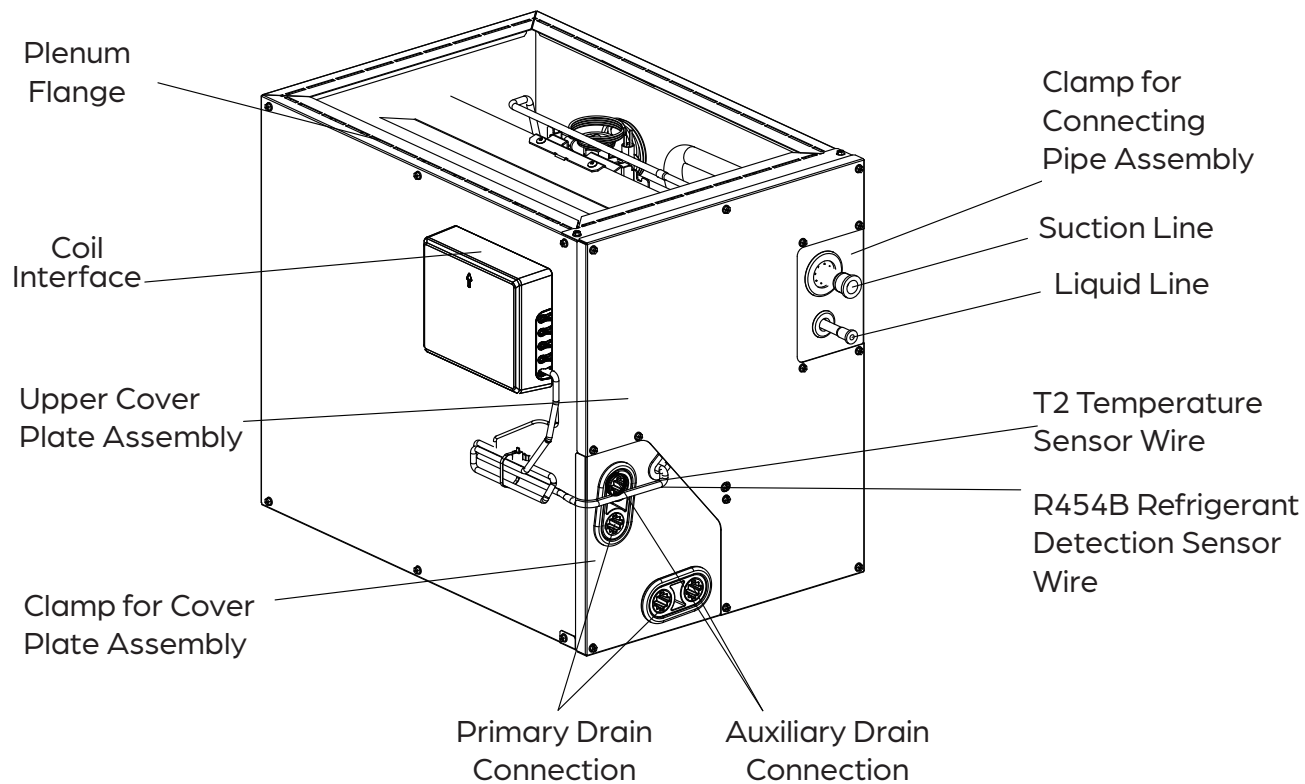
MODEL	LIQUID PIPE in (mm)	SUCTION PIPE in (mm)	DIMENSIONS					NET WEIGHT lbs (kg)
			A (Width) in (mm)	B (Depth) in (mm)	C (Height) in (mm)	D (Supply Width) in (mm)	E (Supply Depth) in (mm)	
DRUC2414S2A	3/8 (9.52)	3/4 (19) ¹	14-1/2 (368)	21 (533)	18 (457)	13-1/4 (336)	18-1/2 (470)	42 (19)
DRUC2417S2A	3/8 (9.52)	3/4 (19)	17-1/2 (445)	21 (533)	18 (457)	16-3/16 (411)	18-1/2 (470)	42 (19)
DRUC3614S2A	3/8 (9.52)	3/4 (19)	14-1/2 (368)	21 (533)	23-5/16 (592)	13-1/4 (336)	18-1/2 (470)	57 (26)
DRUC3617S2A	3/8 (9.52)	3/4 (19)	17-1/2 (445)	21 (533)	23-1/2 (599)	16-3/16 (411)	18-1/2 (470)	60 (27)
DRUC3621S2A	3/8 (9.52)	3/4 (19)	21 (534)	21 (533)	24 (611)	19-3/4 (502)	18-1/2 (470)	64 (29)
DRUC6021S2A	3/8 (9.52)	3/4 (19)	21-1/2 (546)	21-1/2 (549)	28 (711)	19-1/8 (486)	21-1/4 (514)	97 (44)
DRUC6024S2A	3/8 (9.52)	3/4 (19)	24-1/2 (522)	21 (533)	28 (711)	23-1/4 (591)	18-1/2 (470)	81 (37)

¹Adapter included with the DRU1U18S2A must be used to match the coil suction pipe size.

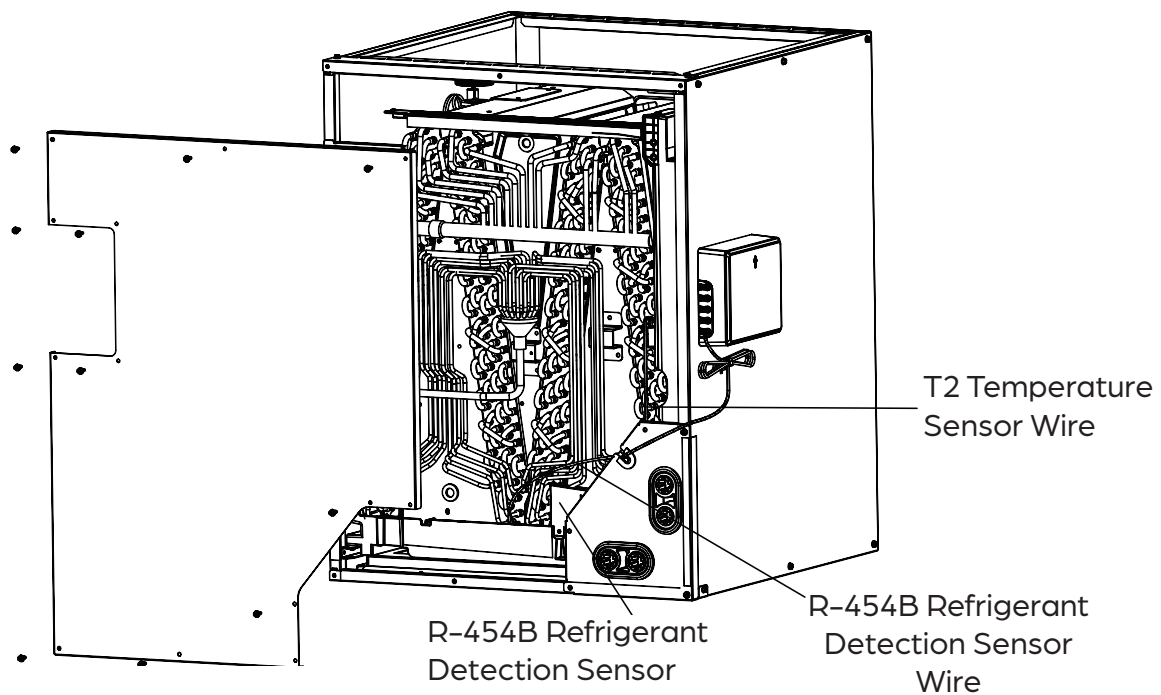
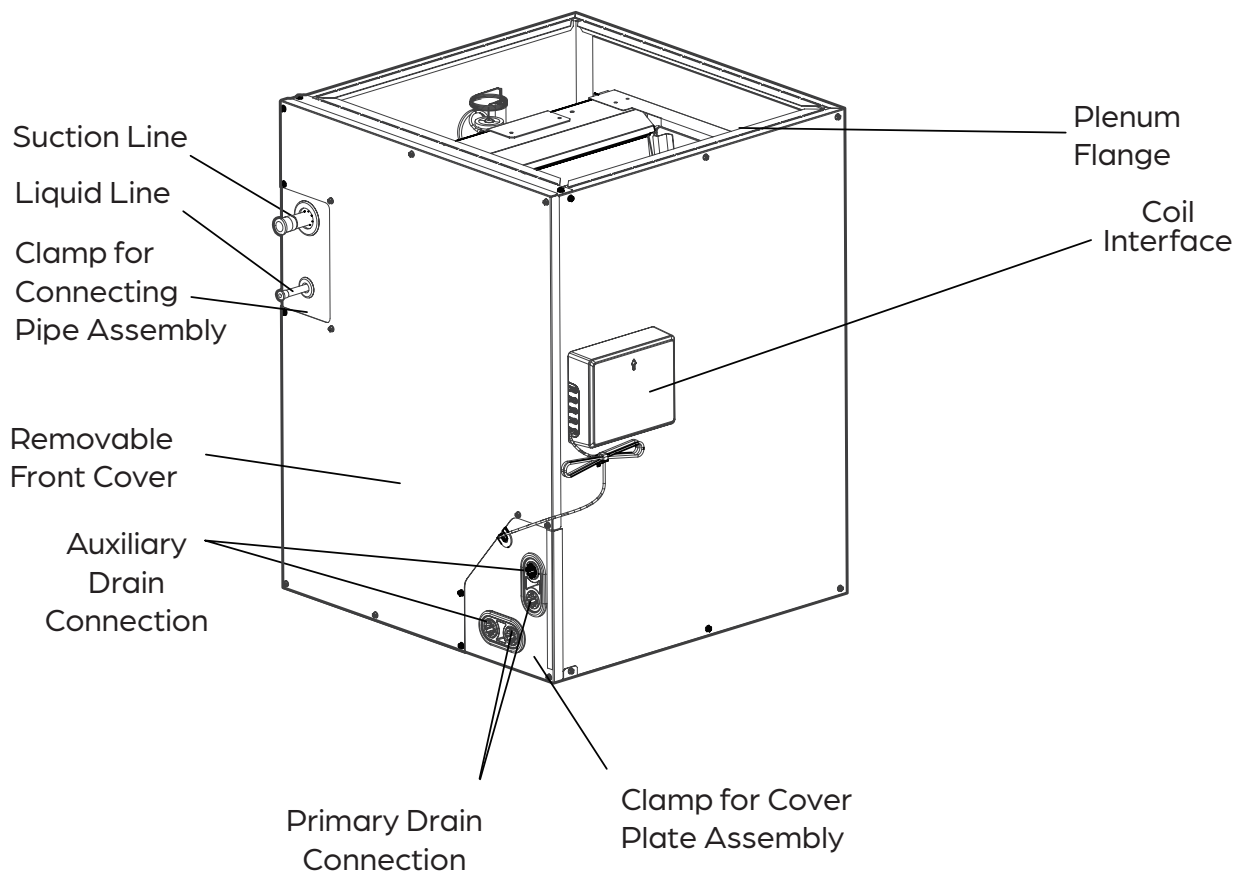
SYSTEM PARTS IDENTIFICATION



COIL PARTS IDENTIFICATION- MOST MODELS



COIL PARTS IDENTIFICATION- DRUC6021S2A ONLY



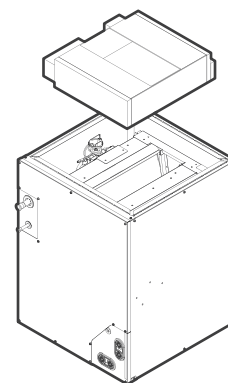
INSTALLATION PREPARATION

UNPACK THE UNIT

Carefully unpack the unit and inspect the contents for damage. If any damage is found at the time of delivery, notify the carrier or distributor. Check the rating plate to verify the model number, voltage, and any kits match with what you ordered.

**CAUTION**

Remove the foam packing material from within the unit and verify that all foreign objects are removed.

**NOTE**

The installation must be performed in accordance with the required local and national standards. The installation may be slightly different in different areas.

SELECT INSTALLATION LOCATION

Before installing the indoor unit, you must choose an appropriate location. The following standards must be met for an appropriate location for the unit.

Install the unit:

- With enough room for installation (connecting pipe and drainage) and maintenance.
- On a structure that can support its weight. If the structure is too weak, the unit may fall and cause personal injury, unit and property damage, or death.
- With heating elements at least 18 inches above the floor in a garage. Failure to follow these instructions can result in death, explosion, or fire.
- Cables and wires at least three (3) feet / one (1) meter from televisions or radios to prevent static or image distortion. Depending on the coils, a three (3) feet / one (1) meter distance may not be sufficient.

DO NOT install the unit in:

- A wet environment. Excessive moisture can corrode the equipment, electrical components, and cause electrical shorts.
- A coastal area with high salt content in the air.
- Areas with strong magnetic waves.
- Areas with oil drilling or fracking.
- Areas where there may be detergent or other corrosive gases in the air, such as bathrooms or laundry rooms.
- Areas that store flammable materials or gas. Danger of explosion. Keep flammable materials and vapors, such as gasoline, away from air handler.
- Areas where the air inlet or outlet of the indoor or outdoor unit may be obstructed.

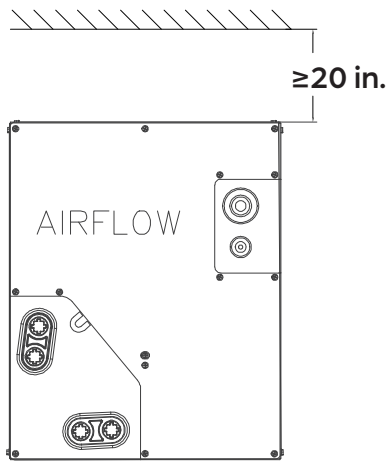
**NOTE**

In addition, you must be aware of needed clearance space, installation direction, and duct requirements. These items are covered in the following pages.

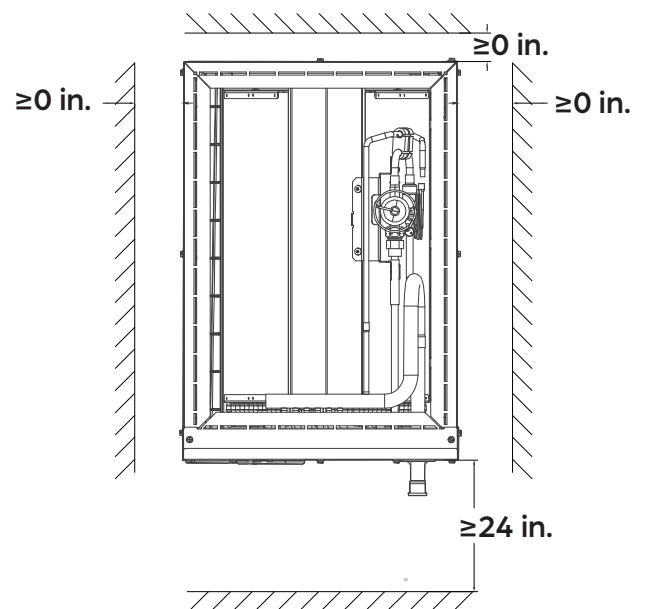
RECOMMENDED UNIT CLEARANCE

- NOTE**
- Be aware of the following needed clearances during installation:
- Maintenance and service access, including coil cleaning and coil assembly removal
 - Refrigerant piping and connections
 - Condensate drain line
 - Coil interface control box
- The images below are for illustrative purposes only. Refer to the images on pages 20, 22 and 23 and the unit itself.

Coil Front View



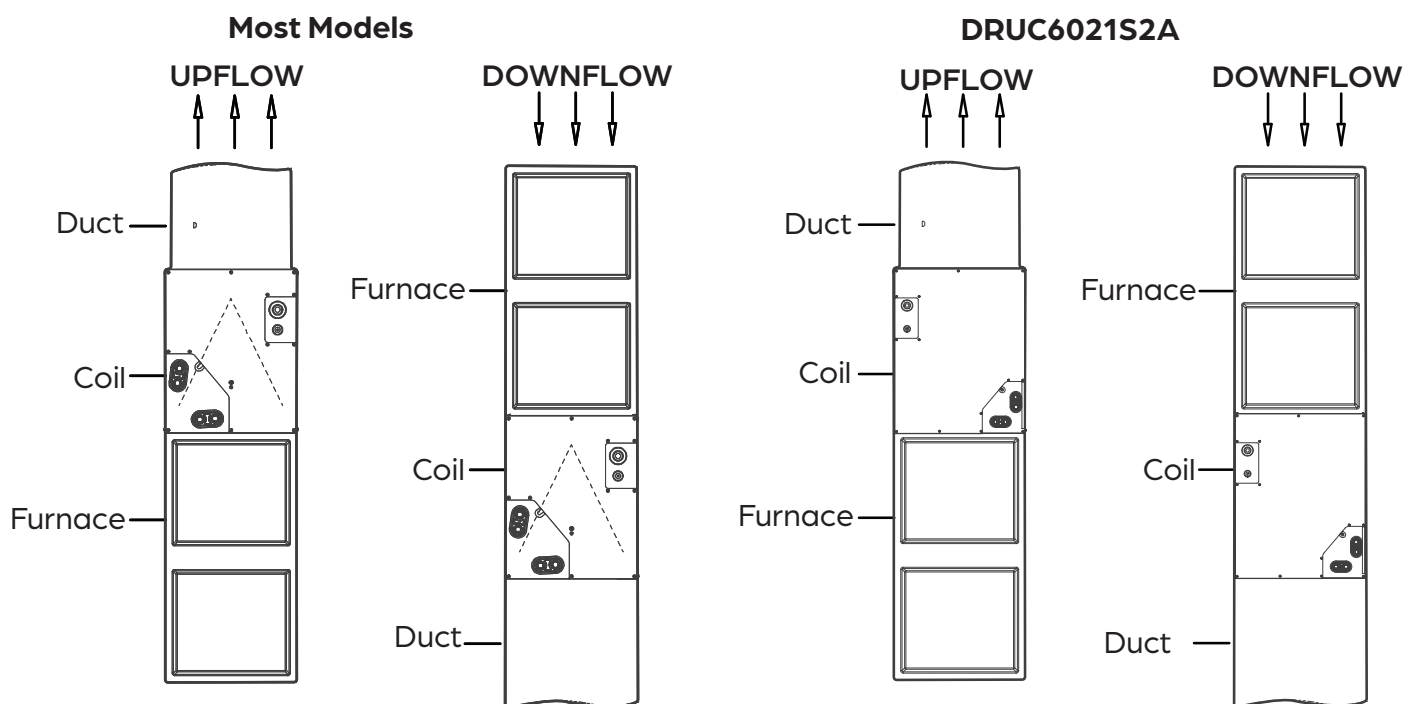
Coil Top View



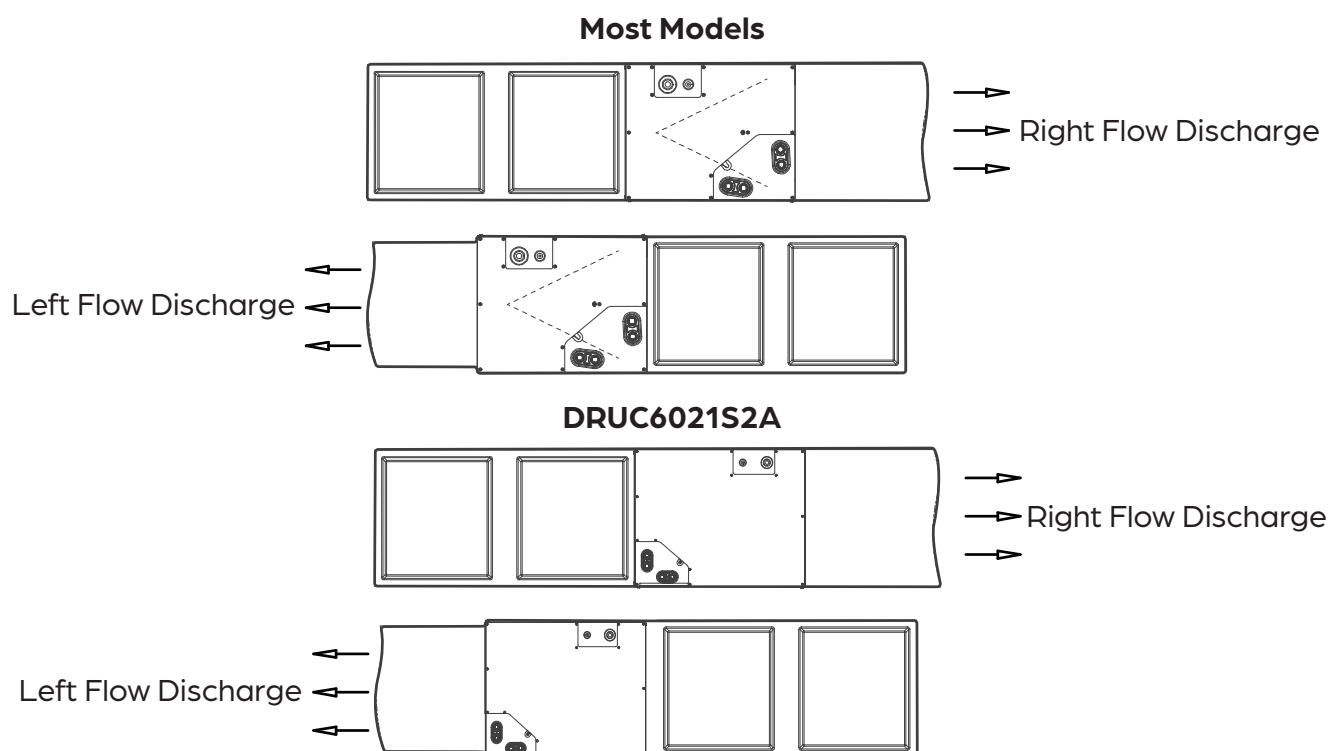
DETERMINE INSTALLATION DIRECTION

The units can be installed in a vertical (up or down) or horizontal (right or left) configuration.

VERTICAL INSTALLATION



HORIZONTAL INSTALLATION



WARNING

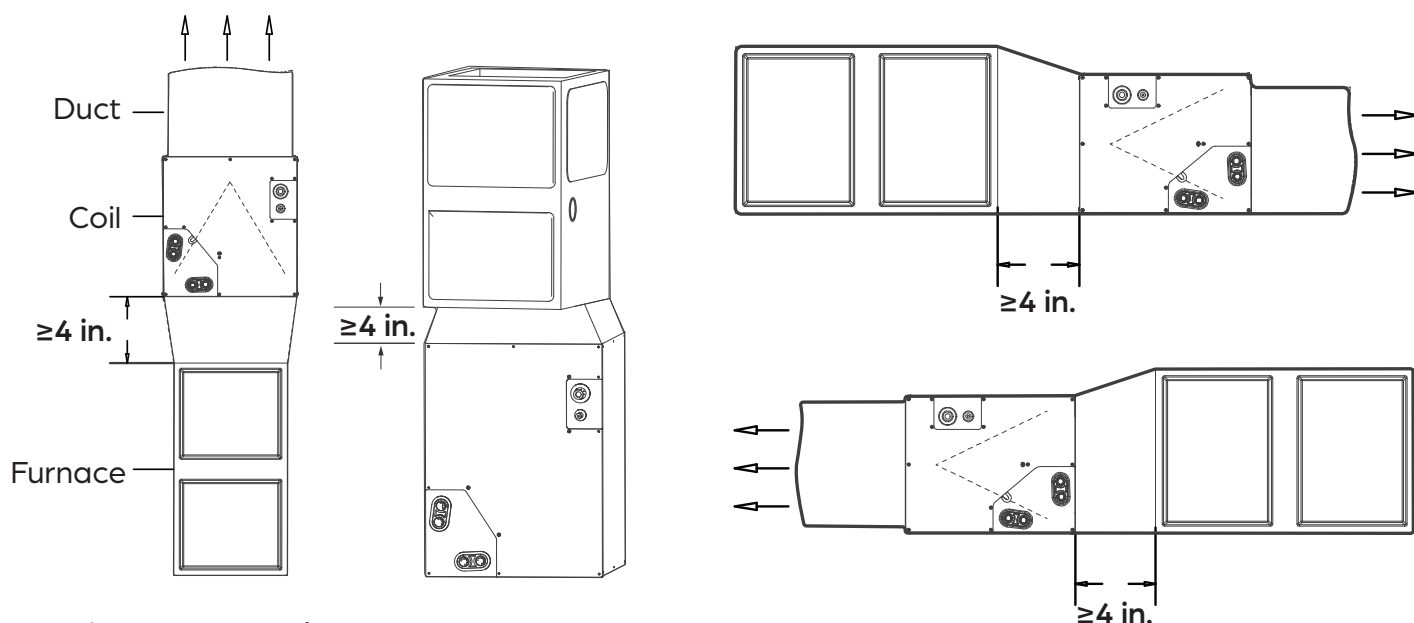


It is recommended that a field supplied secondary drain pan is installed with a overflow cut-off switch. This is especially true when the installation is above or in a finished living space. Local codes may require this.

COIL INSTALLATION ON THE FURNACE

Determine if a Field-Fabricated Transition is Necessary

The cased coil is designed to fit furnaces of the same width. If the coil is wider than the furnace, or vice versa, create a field fabricated adapter that is > 4 inches in width to allow air flow to evenly flow through the coil slabs. This is illustrated below. The drain and refrigerant connections may differ based on the model, see the diagrams on the previous pages.



Upflow Installation

1. Set the coil in place on the upflow furnace discharge opening.
2. Ensure the coil is level for proper condensate drainage. Do not tip the coil toward the condensate drain, the drain pan is already sloped properly.
3. The coil may not need to be fastened to the furnace with fastener but refer to the furnace installation manual for more instruction.
4. Seal the joint between the coil casing and the furnace to create an air tight seal using tape or sealant in accordance with local codes.

Downflow Installation

IMPORTANT



If the airflow is high due to ductwork or other causes, there is a chance for water to blow off the coil into the ductwork. It is recommended that a 4 inch minimum field-supplied adapter be placed between the coil and the furnace to allow the air to distribute evenly to both coil slabs.

1. Ensure the supporting structure is sufficient for the weight of the coil and furnace.
2. Set the cased coil on the supply duct opening, ensuring that the coil is level.
3. If necessary, place a field-fabricated 4 in minimum adapter on the coil casing. Taper the adapter when the coil and furnace are not the same size.
4. Set the furnace on the adapter and follow the instructions in the furnace manual to properly secure the furnace and coil.
5. Seal the joint between the coil casing and the furnace to create an air tight seal using tape or sealant in accordance with local codes.

Horizontal Installation

The unit can be installed on a platform, secured to roof truss in an attic, suspended from hangers on floor joists in a crawl space, or installed on blocks in a drain pan. It is designed to allow airflow in either direction and to pair with horizontal-left or horizontal-right furnaces.

1. Depending on your model and orientation, the plenum flanges shown on pages 22 and 23 can be bent out and used to connect the coil to the furnace or the ductwork.
2. Ensure the coil is positioned so the drain pipe fittings are at the bottom of the coil regardless of airflow direction.
3. Position the coil casing snugly against the furnace.
4. Ensure coil cabinet is level side to side and front to back. It is allowable to add up to 1/2 in of additional slope over length and depth of coil cabinet in the direction of drain pan connection.
5. Use self-tapping screws to attach the coil and furnace.
6. If the coil is wider than the furnace, use a 4 inch minimum transition and self-tapping screws to attach the furnace.
7. Seal the joint between the coil casing and the furnace to create an air tight seal using tape or sealant in accordance with local codes.

DUCT REQUIREMENTS



NOTE

This unit is not designed for non-ducted (free-blow) applications

The vast majority of problems encountered with ducted systems can be linked to improperly designed or installed duct systems. It is critical for the function and longevity of the unit that the ductwork is correctly designed and installed.

sheet-metal ductwork installed in unconditioned areas must be insulated and protected with a vapor barrier. Fibrous ductwork is acceptable when built and installed according to the SMACNA Construction Standard on Fibrous Glass Ducts. All duct systems must meet National Fire Protection Association requirements and comply with UL 181 testing for Class I air ducts. Always verify local code requirements for duct materials and insulation.

- Design the duct system to stay within the unit's rated external static pressure, ensuring adequate airflow and accounting for all resistance from supply/return ducts, grilles, filters, and accessories.
- Refer to the airflow performance tables in this manual.
- Use flexible duct collars to minimize the transmission of vibration/noise into the conditioned space.
- It is recommended to use lined return and supply duct near the unit when noise is a concern.
- The ductwork should be assembled according to best practices and local codes.
- The supply air duct connection should be properly sized by use of a transition to match the unit opening.
- All ducts should be suspended using flexible hangers and never fastened directly to the structure.
- **IMPORTANT:** Any elbow installed near the unit must be at least the same size as the supply duct flange.
- **IMPORTANT:** Do not fasten the front flange of the return duct into areas containing power wiring, as screws or drills may damage wire insulation.

**WARNING**

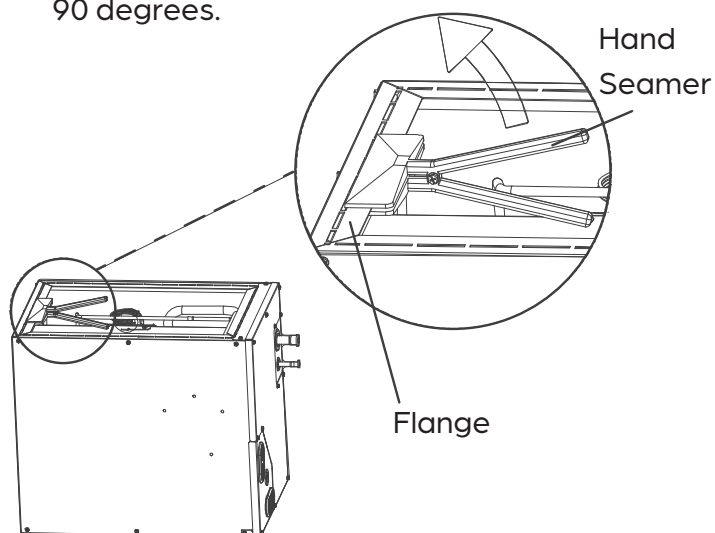
Do not install this coil or draw return air from where a gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

**WARNING**

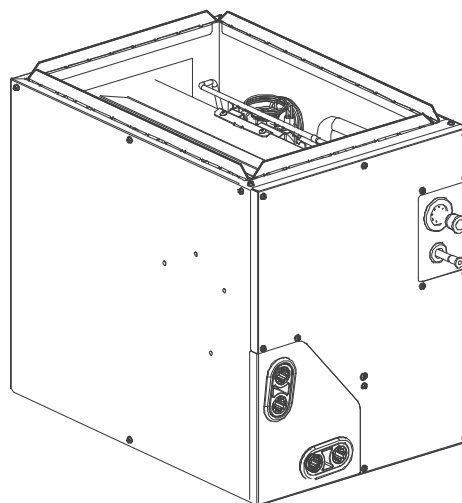
Auxiliary equipment that could serve as an ignition source must not be installed within the ductwork. Potential ignition sources include hot surfaces with temperatures above 700 °C and electrical switching devices.

Connecting Ductwork

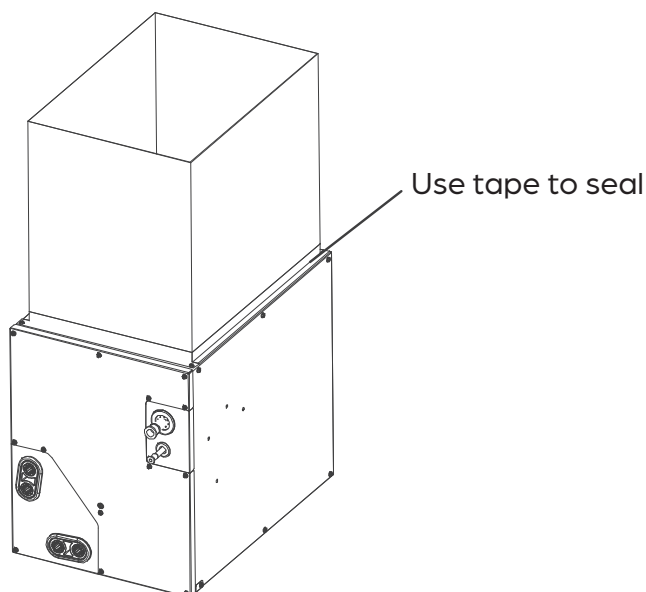
1. Use a hand seamer to bend the flange up 90 degrees.



2. Bend the flanges outward.



3. Seal the joint between the coil casing and the duct to create an air tight seal using tape or sealant in accordance with local codes. It is recommended to wrap the duct plenum with insulation.



CONDENSATE DRAIN LINE CONNECTION

The coil is designed to dispose of accumulated water through built-in condensate drain fittings.

- After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.
- It is recommended that PVC fittings be used on the condensate pan.
- Do not over-tighten fittings. Finger tighten plus 1-1/2 turns.
- Be sure the plastic plug is installed in the unused condensate drain fitting.
- Two 3/4 inch female threaded pipe connections are provided in each coil condensate pan.
- It is recommended to use a cleanout trap. Consult local codes for additional restrictions or precautions. The following guidelines are suggested to assure proper drainage:
 - Install a trap in the condensate line of the coil as close to the coil as possible.
 - Make trap at least 3 inches (76 mm) deep and no higher than the bottom of unit condensate drain opening as shown below.
 - Pitch condensate line 1 inch (25.4 mm) for every 5 ft. of length to an open drain or pump.
 - Make sure that the outlet of each trap is below its connection to condensate pan to prevent condensate from overflowing the drain pan.
 - Prime all traps, test for leaks, and insulate traps and lines if located above a living area.

NOTE



It is recommended to install a trap with a safety switch or use a secondary safety switch in the secondary drain hole. Install a field-fabricated secondary drain pan with an external drain line for any unit placed over finished spaces or areas vulnerable to water damage. The pan should be under the entire coil, and its drain should discharge where it is easily visible to the user.



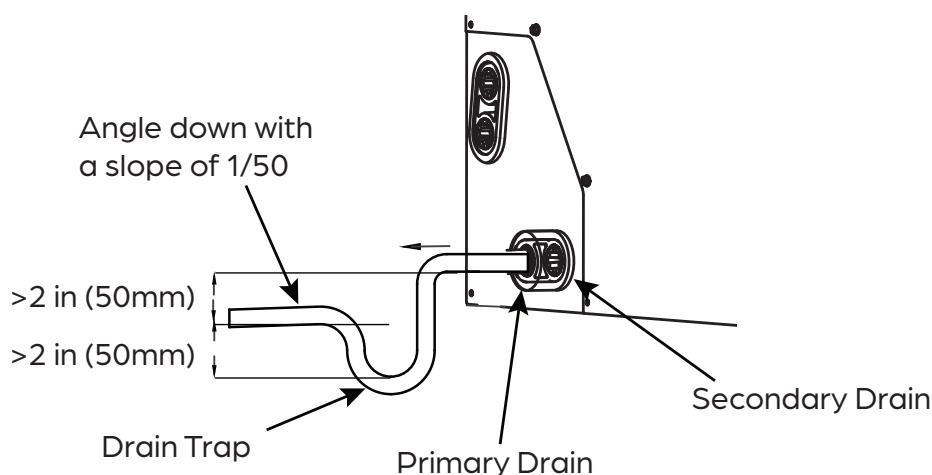
CAUTION

If the condensate line is to be connected to a waste (sewer) line, an open trap with an air gap must be installed ahead of the waste line to prevent escape of sewer gases.



CAUTION

The drainpipe outlet should be at least 1.9" above the ground or anticipated snowfall line. If it touches the ground, the drain may become blocked.



REFRIGERANT PIPING CONNECTION

All field piping must be completed by a licensed technician and must comply with the local and national regulations.

In the event of refrigerant leakage, measures should be taken to prevent the refrigerant concentration in the room from exceeding the safe limit. If the refrigerant leaks and its concentration exceeds its proper limit, hazards due to lack of oxygen may result. Ventilate the area immediately.

WARNING



When connecting refrigerant piping, do not let substances or moisture other than specified refrigerant enter the unit or pipes. Run nitrogen through the refrigerant tubing when brazing to avoid carbon build up. The presence of foreign materials will lower the unit's capacity and can cause abnormally high pressure in the refrigeration system. This can result in explosion and personal injury.

Refrigerant Pipe Length

The length of refrigerant piping will affect the performance and efficiency of the unit. Nominal efficiency is tested with a pipe length of 25 feet (7.6 meters). A minimum pipe run of 10 feet (3 meters) is required to minimize vibration and excessive noise.

Adding Additional Refrigerant

Each outdoor unit is factory charged with enough refrigerant to support up to 25' (7.5m) per zone. This is based on a one way liquid line measurement from the outdoor unit to the indoor unit. Systems with line sets that exceed this length will require additional refrigerant (see the following chart). The refrigerant should be charged from the service port on the outdoor unit's low pressure valve. Additional refrigerant information can be found in the **SUBMITTAL DOCUMENTS** at **WWW.DURASTAR.COM**. Additional refrigerant can be calculated using the following chart and formula:

(Actual pipe length – Standard pipe length) x Additional Refrigerant Charge

Refrigerant Piping Specifications

Outdoor Unit Capacity	Standard Refrigerant Connection Size	Standard Pipe Length w/ Precharged Refrigerant	Additional Refrigerant Charge		Maximum Length of Piping	Maximum Rise Length
			1/4 Liquid Line	3/8 Liquid Line		
	in (L x G)	ft (m)	oz/ft (g/m)	oz/ft (g/m)	ft (m)	ft (m)
18k	3/8 x 3/4	25 (7.6)	0.32 (30)	0.69 (65)	98.4 (30)	65.6 (20)
24k / 30k	3/8 x 3/4	25 (7.6)	0.32 (30)	0.69 (65)	164 (50)	82 (25)
36k / 42k / 48k / 60k	3/8 x 3/4	25 (7.6)	0.32 (30)	0.69 (65)	246 (75)	98.4 (30)

IMPORTANT NOTE:



The TOTAL SYSTEM CHARGE WEIGHT should be noted on the label adjacent to the unit rating label on the outdoor unit.

WARNING

- Failure to follow this warning could result in personal injury. Wear eye protection.
- Coil is factory charged with 15 psi nitrogen. The coil is under pressure and a TXV screen is in place behind liquid line plug. **DO NOT** remove liquid line plug first! Always remove the suction line plug first, to depressurize the coil.

IMPORTANT NOTES:

- Factory nitrogen charge may escape past rubber plugs during storage. This does not indicate a leaking coil nor warrant return of the coil.
- Size and install refrigerant lines according to the outdoor unit capacity and the information provided on the previous page.
- Route refrigerant lines to the coil in a manner that will not obstruct service access to the unit or removal of the furnace filter.
- Do not use damaged, dirty, or contaminated tubing because it may plug the refrigerant flow-control device.
- **ALWAYS** evacuate the coil and field-supplied tubing before opening the outdoor unit service valves.

CAUTION

DO NOT BURY REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, refrigerant may migrate to cooler buried section during extended periods of unit shutdown, causing possible compressor damage at start-up.

CAUTION

Failure to follow this caution may result in product damage. To avoid valve damage to the refrigerant control device while brazing, valves must be wrapped with a heat-sinking material such as a wet cloth.

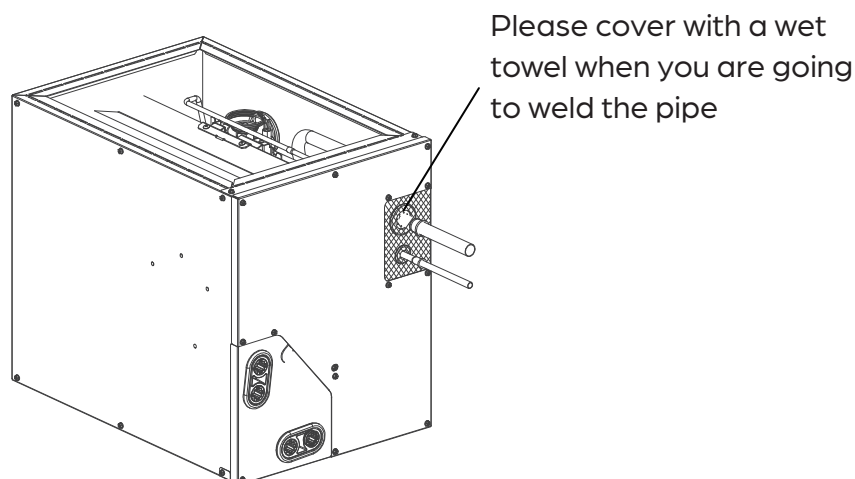
LINE SET CONNECTION

The coil can be connected to outdoor units using field-supplied tubing of refrigerant grade. Always evacuate tubing and reclaim refrigerant when making connections or flaring tubing. Leak check connections before insulating the entire suction line.

1. Remove cabinet access door.
2. Remove the rubber plugs--suction plug first, then the liquid plug-- from the coil stubs, using a pulling and twisting motion. Hold the coil stubs steady to avoid bending or distorting.
3. Remove the tubing plate with rubber grommets and slide the plate with grommets onto the refrigerant lines (field supplied line-set), away from the braze joints.
4. Fit the refrigerant lines into the coil stubs and wrap a heat sinking material such as a wet cloth behind the braze joints.
5. Wrap the TXV bulb and nearby tubing with a heat-sinking material such as a wet cloth.

NOTE

It is advised to braze a 3/8 **bi-flow** drier rated for a minimum working pressure of 600 psig on the liquid line near the indoor unit (or if needed near the outdoor unit). Replace this filter drier each time the sealed system is broken into for service.



6. Use a 1/2 Psig Nitrogen purge in the suction line and out the liquid line.
7. Braze using a Sil-Fos or Phos-copper alloy. Do not use soft solder.
8. After brazing, allow the joints to cool.
9. Carefully remove the TXV bulb insulation and verify that the TXV bulb is securely fastened with a hose clamp.
10. Tighten screw a half-turn past hand tight with the TXV bulb placed in the indentation with full contact with the vapor line tube.
11. Re-wrap the TXV bulb with insulation.
12. Slide tubing plate with rubber grommets over joints. Position tubing at center of each grommet to ensure an air seal around the tube.
13. Reinstall cabinet door.
14. Leak check connections before insulating the entire suction line.

**CAUTION**

Wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.

**CAUTION**

Check to make sure there is no refrigerant leak after completing the installation work. If there is a refrigerant leak, ventilate the area immediately and evacuate the system (refer to the air evacuation section of the outdoor unit manual).

**CAUTION**

Take precautions to ensure aluminum tubes do not come in direct contact or allow for condensate run off with a dissimilar metal. Dissimilar metals can cause galvanic corrosion and possible premature failure.

REFRIGERANT METERING DEVICE

These Coils have a factory installed hard shut-off TXV designed only for use with R-454B refrigerant. Use only with outdoor units designed for R-454B.

ALL TXV'S HAVE PRESET SUPERHEAT SETTINGS AND ARE NOT ADJUSTABLE IN THE FIELD

COIL INTERFACE INSTALLATION (PDRUCINT1)

1. Choose an install location. Priority should be given to installing the coil interface on the front of the coil, or you can choose to install it on the side of the coil or on nearby walls as needed.

Example Installation Locations

- Figure 1: Installed on the side of the coil. (Vertical mounting, you can choose left or right)
- Figure 2: Installed on the side of the coil. (Horizontal mounting)
- Figure 3: Installed on the wall

NOTE



- Ensure the control box is located at least 3 inches above the condensate pipe (or on the opposite side) to ensure water does not enter the control box.

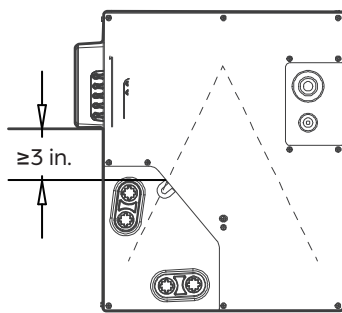


FIGURE 1

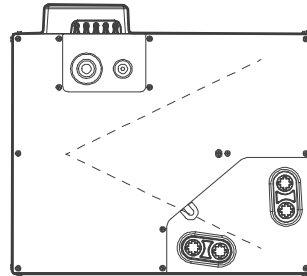


FIGURE 2

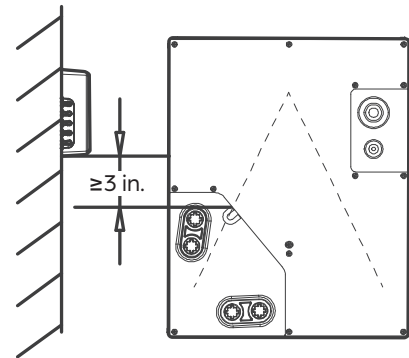
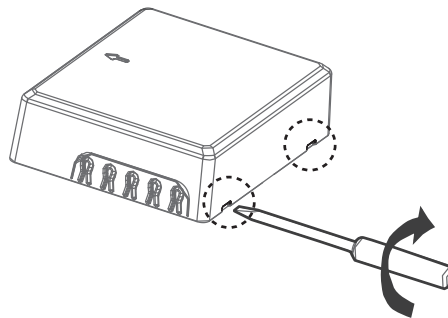
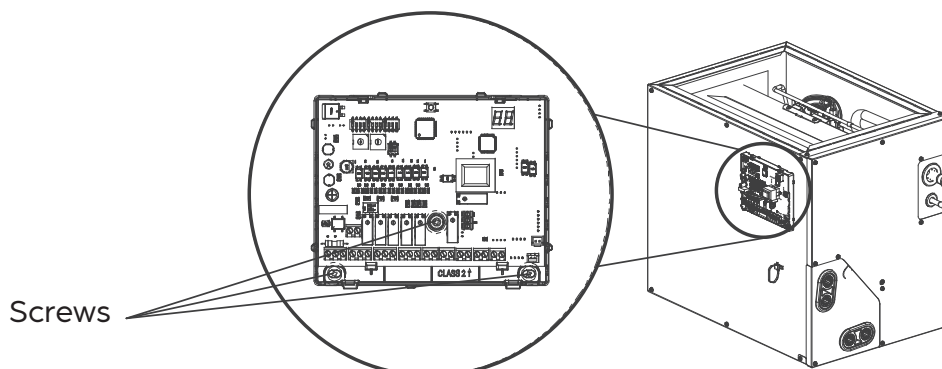


FIGURE 3

2. Insert a flat-head screwdriver into the two indicated slots on the control box, then gently twist it to release and open the cover.



3. Attach the interface using three (3) provided 5/8" screws. Do not use a longer screw as damage to internal coil components could occur.



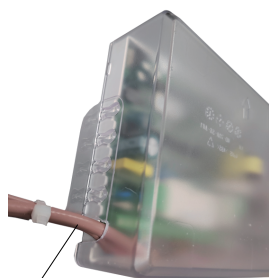
Screws

WARNING


When installing and drilling for the control box screws, make sure the screws do not puncture components inside the coil.

5. After the wiring described in the following sections is completed, cut out cover wiring ports

- On the right and/or the left side of the control box, use pliers to cut out the wire outlets. (If there are multiple wires, cut to the maximum outline shown below.)



Wire knockout



Wire knockout maximum outline

6. Close the lid tightly once wiring is complete.

WIRING PRECAUTIONS

WARNING


Failure to follow warnings may lead to equipment damage, injury or death. Field line side wires may remain live, DO NOT perform service or maintenance until the main disconnect is pulled. Wait 10 minutes for capacitors to fully discharge.

WARNING


While connecting the wires, strictly follow the wiring diagram, and refer to the nameplate for electrical information. Wire according to NEC and local codes. The refrigerant circuit can become very hot. Keep the interconnection cable away from the copper tube.

WARNING


BEFORE PERFORMING ANY ELECTRICAL WORK, READ THESE WARNINGS.

- All wiring must comply with local and national electrical codes, regulations and must be installed by a licensed electrician.
- If there is a serious safety issue with the power supply, stop work immediately.
- Power voltage should be within 90–110% of rated voltage. Insufficient power supply can cause malfunction, electrical shock, or fire.
- Installation of an external surge protector at the outdoor disconnect is recommended.
- If connecting power to fixed wiring, a switch or circuit breaker that disconnects all poles and has a contact separation of at least 1/8in (3mm) must be incorporated in the fixed wiring. The qualified technician must use an approved circuit breaker or switch.

- Only connect the unit to an individual branch circuit. Do not connect another appliance to that circuit.
- Use copper wire only.
- Make sure to properly ground the coil.
- Every wire must be firmly connected. Loose wiring can cause the terminal to overheat, resulting in product malfunction and possible fire.
- Do not let wires touch or rest against refrigerant tubing, the compressor, or any moving parts within the unit.
- To avoid getting an electric shock, never touch the electrical components right after the power supply has been turned off. After turning off the power, always wait 10 minutes or more before you touch the electrical components.
- Make sure that you do not cross your electrical wiring with your signal wiring. This may cause distortion, interference or possibly damage to circuit boards.
- Connect the outdoor wires before connecting the indoor wires.

Requirements for installation of the critical-to-safety wiring connection of the leak detection sensor or leak detection system to the furnace per UL 60335-2-40.

- Critical-to-safety wiring is any field installed wiring necessary to fulfill the requirements of minimum room area in the event of detection of a leak.
- The wiring shall be not less than 18 AWG with a minimum insulation thickness of 1.58 mm and protected from damage.
- The appliance shall not be installed on furnaces with an inductive electrical greater than Le as calculated as follows:

Since S_u is the burning velocity of a refrigerant in centimeters per second (cm/s) and the S_u for R-454B is 6.7cm/s. The switched electrical load (Le) in kVA is less than or equal to the following:

$Le = 5 \times (6.7 / S_u)^4 = 5$ when breaking all phases;

$Le = 2.5 \times (6.7 / S_u)^4 = 2.5$ when breaking two legs of a three-phase load, or when breaking one or two legs of a single-phase load.

- Detection of a leak shall turn on the indoor fan at the highest available speed or turn it on to not less than minimum airflow listed earlier in this manual (QH_{min}).

INTERFACE SENSOR CONNECTIONS

Refrigerant Leak Sensor Connection

The refrigerant sensor is already installed in place in the coil. However, its wire **must be connected to the coil interface at the black 4-pin plug (CN8)**. The sensor can remain in the same position regardless of the installation direction.

NOTE



There is a second red plug (CN5) that is used in rare situations where 3rd party equipment requires an additional refrigerant sensor. The factory default uses one sensor with switch SW5 off. If SW5 is turned on, sensors must be plugged into CN8 and CN5 otherwise and FHCC error will occur. **If the default refrigerant sensor wire is incorrectly plugged into red CN5 instead of black CN8 a FHCC error will occur.**

WARNING



When using a gas furnace for heating, ensure that the heat exchanger temperature does not exceed 200°F. Exceeding this temperature may cause the refrigerant leak sensor to malfunction, which can lead to a hazardous situation.

Coil Temperature Sensor (T2) Connection

The coil temperature sensor is preinstalled in the proper location, but the wire must be plugged into CN47 on the coil interface.

Room Air Sensor (T1) Placement and Connection

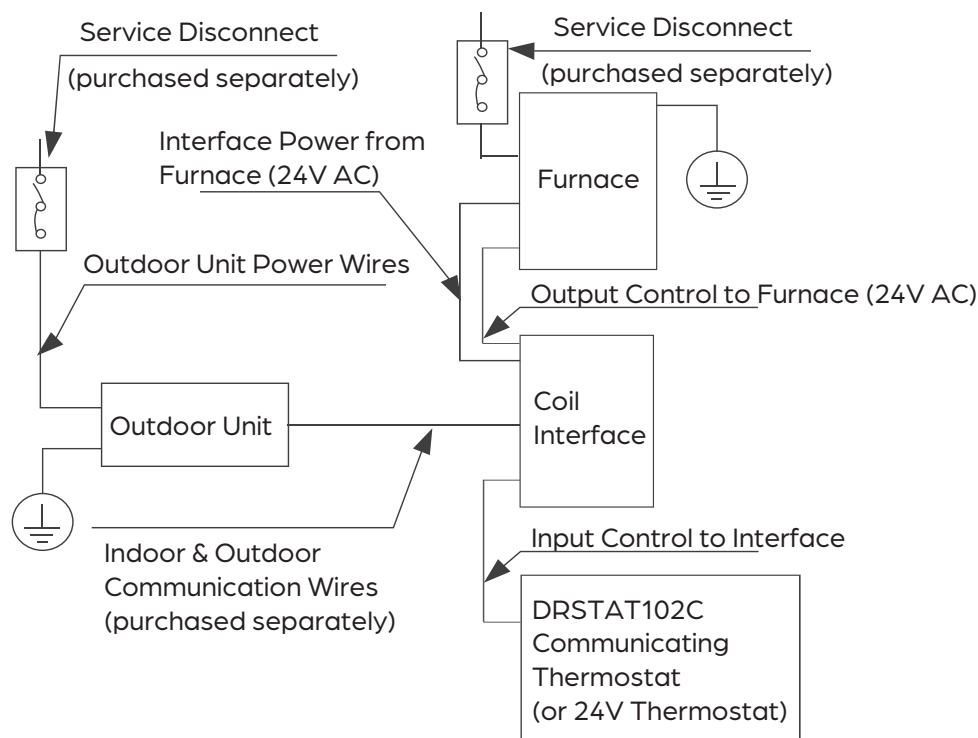
The coil comes with the T1 sensor and a sensor extension cable. Use the cable length that best fits your installation. Install the T1 sensor in the return air plenum of the furnace as shown in the overview on page 21. Plug the T1 sensor wire into CN46 on the coil interface.

WIRING OVERVIEW



NOTE

The diagrams are for explanatory purposes only. Your unit may be slightly different. Select the disconnect and wires as required by local, state, and national codes.



NOTE



See the outdoor unit installation manual for instructions on how to connect outdoor unit wiring. Reference the furnace installation manual and wiring diagram for installation details.

INDOOR UNIT WIRING

**WARNING**

Before performing any electrical or wiring work, turn off the main power to the system.

Connect the Signal Cable

The signal cable enables communication between the indoor and outdoor units. You must first choose the right cable size before preparing it for connection. Run a continuous length of cable and avoid splicing the cable.

Cable Sizing

Use the correct size cable depending on the communication type (see the following page)

- Non-polar RS485 Communication (S1/S2): 16 AWG to 20 AWG wire can be used. On new installations or if you experience communication interference, it is strongly recommended to use 16 AWG stranded, shielded wire for the best communication.
- 24V Communication: 18 AWG/ 8 conductor thermostat wire
- Power Cables: Determined by the minimum circuit ampacity (MCA) and maximum over current protection (MOCP) of system and the NEC and local codes in your area. Refer to the nameplate to choose the right cable, fuse, or switch.

STEP 1. PREPARE THE CABLE FOR CONNECTION.

- Using wire strippers, strip the insulating jacket from both ends of the signal cable to reveal about 5 in (12 cm) of the wire, then strip the insulation from the ends of the wires.

STEP 2. OPEN THE FRONT PANEL OF THE UNIT.

- Using a screwdriver, remove the cover of the electric control box on your indoor unit.

STEP 3. CONNECT THE WIRES TO THE TERMINALS.

- Thread the power cable and the signal cable through the wire outlet.
- Match the wire colors/labels with the labels on the terminal block. Firmly screw the wires of each wire to its corresponding terminal. Refer to the Serial Number and Wiring Diagram located on the cover of the electric control box.

Wiring the Communication Cable

The coil ships with DIP SWITCH SW1 defaulted to off as seen below. Under this setting, the system will AUTOMATICALLY detect which of the three connection methods on the following page has been used. In the event of unexpected failure, the SW1 can be switched according to connection methods 1, 2, and 3.

Default Indoor Unit
SW1

**CAUTION**

DO NOT connect 24VAC to the S1/S2 terminals. This will damage the system. Only connect to Class 2 terminals.

Wiring Methods

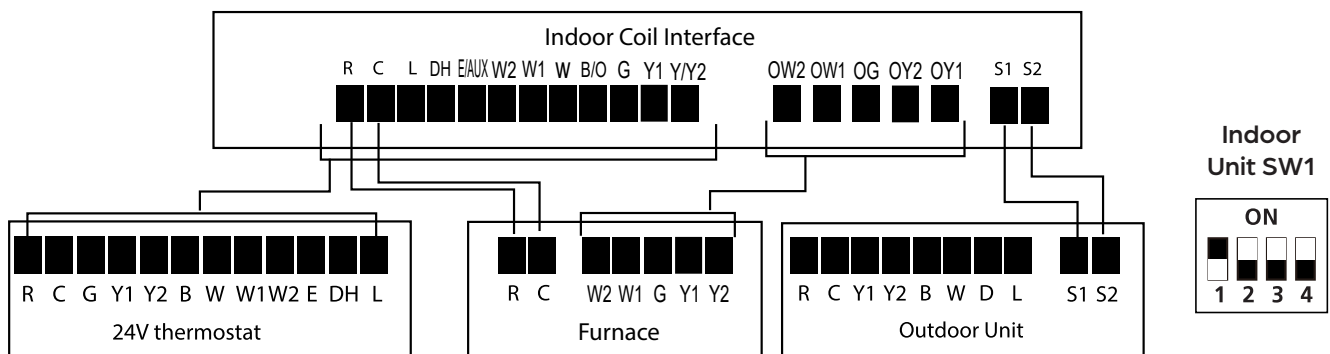


CAUTION

Please refer to the wiring diagram for the wiring method.

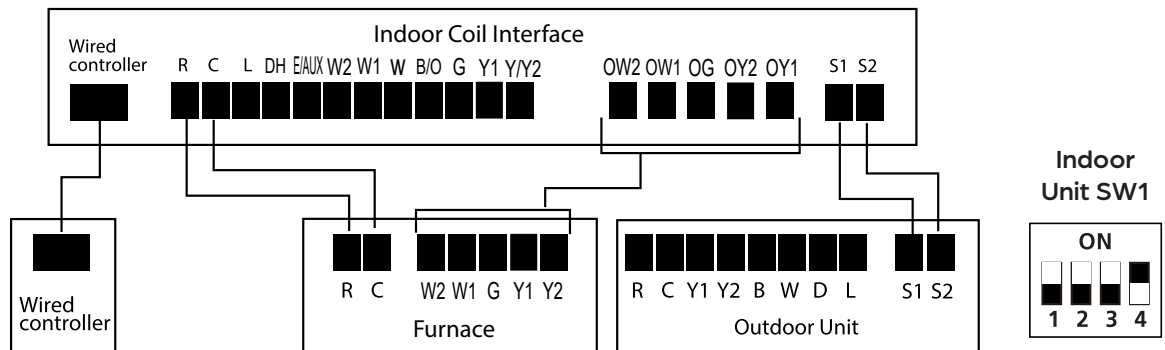
Connection Method 1: RS485 Communication + 24V Thermostat

Use this method to connect a 24V thermostat while the indoor and outdoor are connected via RS485 communication. (In this method the auto ODU clean function is turned off)



Connection Method 2: Full RS485 Communication (Recommended Method)

Use this method to connect the DRSTAT102C thermostat that is purchased separately.



NOTE



For method 1 and 2, if there is a power failure or communication error, the compressor delays operating in heating mode for a period of 3 minutes after communication recovery.

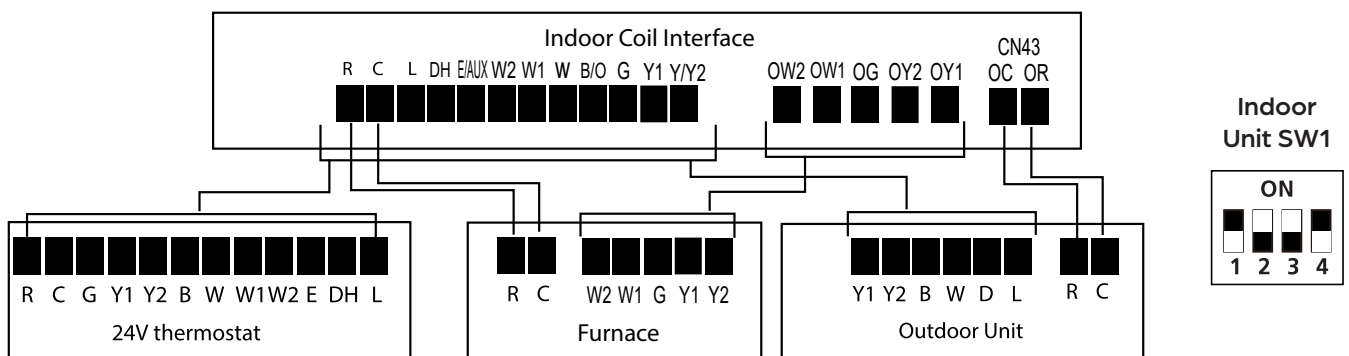
Connection Method 3: 24V Communication

This method does not comply with the DOE Controls Verification Procedure (10 CFR Part 429.134) effective 7/7/2026. AHRI rated systems must be installed using Method 1 or 2. Refer to 24V wiring methods on the following two pages depending on your application. SW1-2 must be flipped on at the outdoor unit.

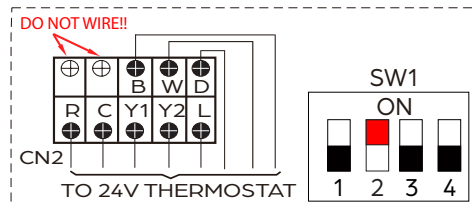
IMPORTANT NOTE!



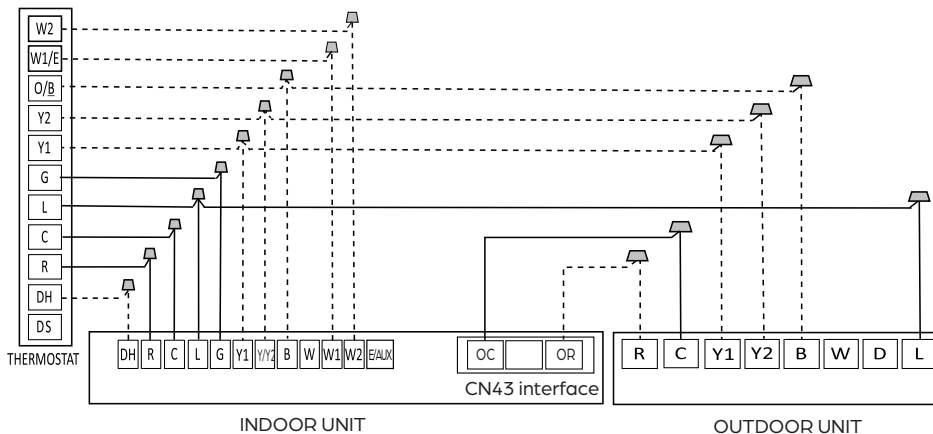
The terminals OC and OR on CN43 of the Coil Interface must be connected to the outdoor unit when using this method. That will stop the operation of the outdoor unit for safety if a refrigerant leakage happens.



Note: Outdoor 24V Connection



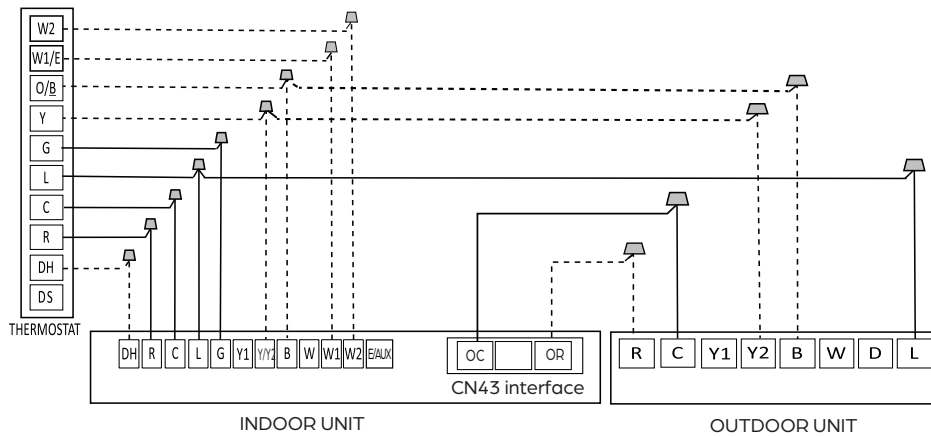
Wiring for 4H and 2C Thermostat



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

S4-1 Default on, W1 and W2
shorted for single stage Aux heat
operation. Turn off to separate stages.

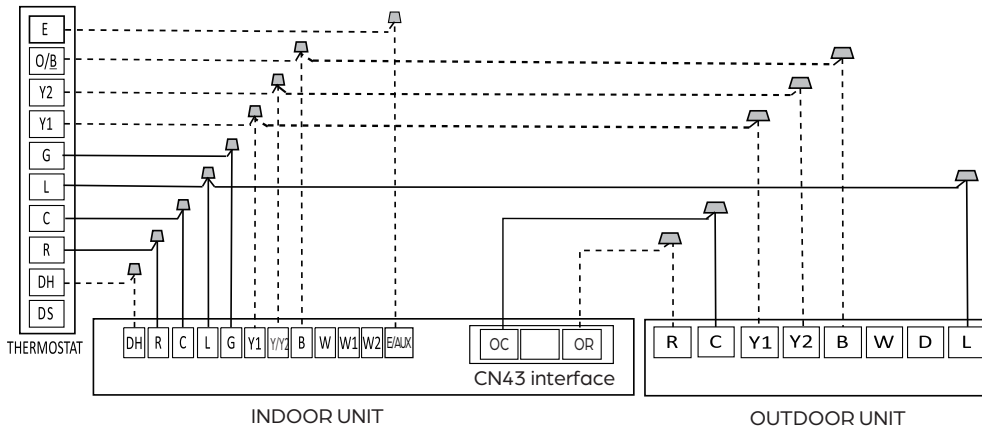
Wiring for 3H and 1C Thermostat



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

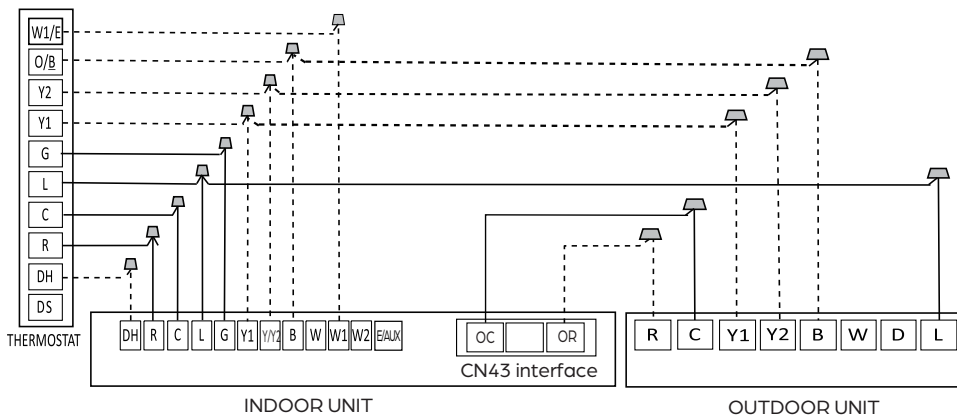
S4-1 Default on, W1 and W2
shorted for single stage Aux heat
operation. Turn off to separate stages.

Wiring for 3H and 2C Thermostat



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

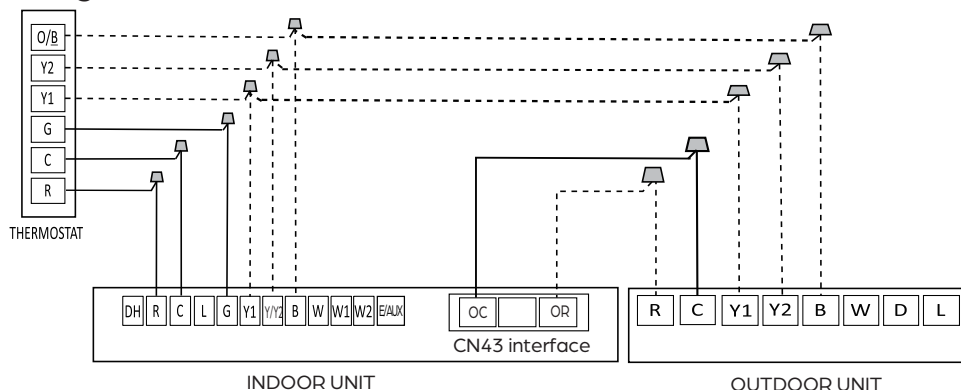
Wiring for 3H and 2C Thermostat



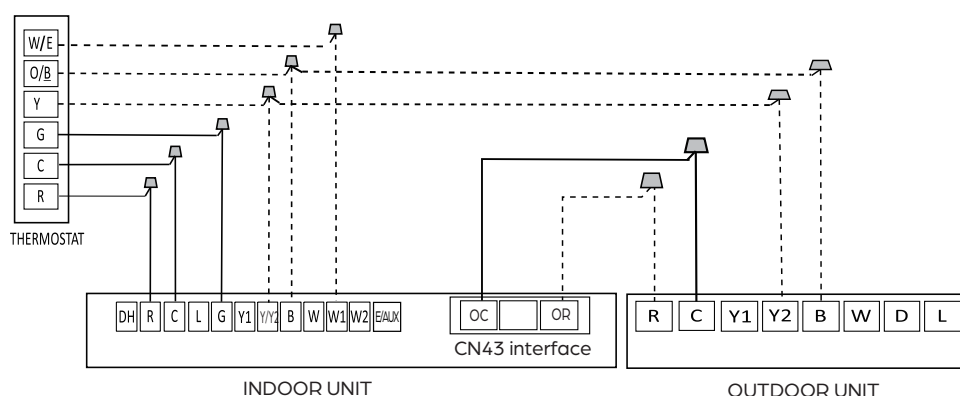
S4-2 Default on, DH function off.
Turn switch off to activate DH
function.

S4-1 Default on, W1 and W2
shorted for single stage Aux heat
operation. Turn off to separate stages.

Wiring for 2H and 2C Thermostat



Wiring for 2H and 1C Thermostat



S4-1 Default on, W1 and W2 shorted for single stage Aux heat operation. Turn off to separate stages.

COIL INTERFACE 24V CONTROL LOGIC

Signal from Thermostat

CONNECTOR	PURPOSE
G	Fan Control
Y1	Heat/Cool Low Demand
Y/Y2	Heat/Cool High Demand
B	Heating Reversing Valve
W	Heat Pump Control
W1	Stage 1 Furnace Heating
W2	Stage 2 Furnace Heating
E/AUX	Emergency Heating
DH/BK	Dehumidification
DS	Reserved Signal
L	System Fault Signal

Power from Furnace to Interface

CONNECTOR	PURPOSE
R	24v Power Connection
C	Common

Signal to Furnace

CONNECTOR	PURPOSE
OW1	Stage 1 Furnace Heating
OW2	Stage 2 Furnace Heating
OY1	Heat/Cool Low Demand
OY2	Heat/Cool High Demand
OG	Fan Control

Signal to Thermostat

CONNECTOR	PURPOSE
L	Malfunction Indicator

Outdoor Unit Connectors

CONNECTOR	PURPOSE
R	24v Power Connection
C	Common
Y1	Low Cooling
Y2	High Cooling
B	Heating Reversing Valve
W	Heating Control
D	Defrost Control
L	System Fault Signal

Description Of Wired Controller Modes

FURNACE	Furnace Heating Only
HEAT PUMP	Heat Pump Heating
DUAL FUEL	Furnace Heating/ HP Heating Automatic Control

EXPLANATION OF FURNACE CONNECTIONS

Control signals to the furnace are the standard thermostat control signals R, C, OW1, OW2, OG, OY1 and OY2 with O standing for output.

CONNECTOR	PURPOSE
R	Provides 24VAC power from the furnace to the board.
C	The 24VAC common wire between the furnace and the board.
OW1	First stage of furnace command line from the board to the furnace (OW1-W1). For furnaces that only have a W and do not have a W2, connect OW1 to the W of the furnace and make no connection with the OW2 signal wire (OW1-W).
OW2	Second stage of furnace command line from the board to the furnace (OW2-W2). OW2 cannot be ON unless OW1 is already ON.
OG	Connect the OG signal to G of the furnace (OG-G). For furnaces that do not have a G, connect OG to the Y or Y1 of the furnace (OG-Y or OG-Y1).
OY1	For 1-speed configuration, connect the OY1 signal to Y of the furnace and make no connection with the OY2 signal wire (OY1-Y). For 2-speed configuration, connect the OY1 signal to Y1 of the furnace (OY1-Y1).
OY2	For 2-speed configuration, connect the OY2 signal to Y2 of the furnace (OY2-Y2). In this configuration, the OY2 signal turns on as follows: • In Cool mode or Heat mode with HP when high speed fan is requested. • In Auto Fan and Cool mode, the signal goes to high speed when the difference between room temperature and set point temperature is more than or equal to 1.5°C. The signal goes back to low speed when the temperature difference is less than 1°C. • In Auto Fan and Heat mode with the HP, the signal goes to high speed when the difference between room temperature and set point temperature is less than or equal to -1.5°C. The signal goes back to low speed when the temperature difference is more than 0°C.

NOTE



- Room temperature sensor to be installed in the return air.
- Coil temperature sensor to be installed on the COIL as specified.

ELECTRICAL RATNGS

ELECTRICAL INPUTS

TYPE	RATING	TERMINALS	WIRE GAUGE/ TORQUE
Power from Furnace	24 V AC, 60 Hz, 300mA, Class 2	CN1-3(R) CN1-2(C)	16-18 AWG / 0.5 N-m
Remote On/Off Control	12 V DC, SELV	CN2	14-22 AWG / 0.5 N-m

COMMUNICATION

TYPE	RATING	TERMINALS	
Between indoor and outdoor unit	5 V DC, Class 2, Limited Energy (≤ 15 W)	CN17	16-18 AWG / 0.5 N-m
Between coil interface (PDRUCINT1) and external 24V thermostat	24 V AC, 60 Hz, Class 2	CN4, CN6, CN11	16-18 AWG / 0.5 N-m
Between coil interface (PDRUCINT1) and centralized controller (XYE)	5 V DC, Class 2	CN3	14-22 AWG / 0.5 N-m
External Communication (HAHB) for DRSTAT102C	18 V DC, Class 2, Limited Energy (≤ 15 W)	CN19	14-22 AWG / 0.5 N-m
Between coil interface (PDRUCINT1) and refrigerant sensor	5V DC, Class 2	CN5, CN8	18 AWG / 0.5 N-m

OUTPUTS

TYPE	RATING	TERMINALS	
Control Device for Furnace (Relay RY7, RY8)	24 V AC, 60 Hz, Class 2, General Use(Signal Use)	CN9	18 AWG / 0.5 N-m
Control Device for Furnace (Relay, RY9, RY10)	24 V AC, 60 Hz, Class 2, General Use(Signal Use)	CN10	18 AWG / 0.5 N-m
Control Device for Outdoor Unit When full 24V communication (Relay, RY11)	24 V AC, 60 Hz, Class 2, General Use(Signal Use)	CN43	18 AWG / 0.5 N-m

Control Scenarios

Use the following two charts on the next page to make dip switch changes based on the chosen control scenario.

Control Scenario	24V Tstat, S1+S2	1
	DRSTAT102C Wired Controller, S1+S2	2
	Full 24V	3



CAUTION

UNIT MUST BE POWERED OFF BEFORE ADJUSTING SWITCHES

DIP SWITCH DEFINITIONS



CAUTION

Only certified service technicians should change dip switch settings. Incorrect dip switch settings cause malfunctions or harm the unit.

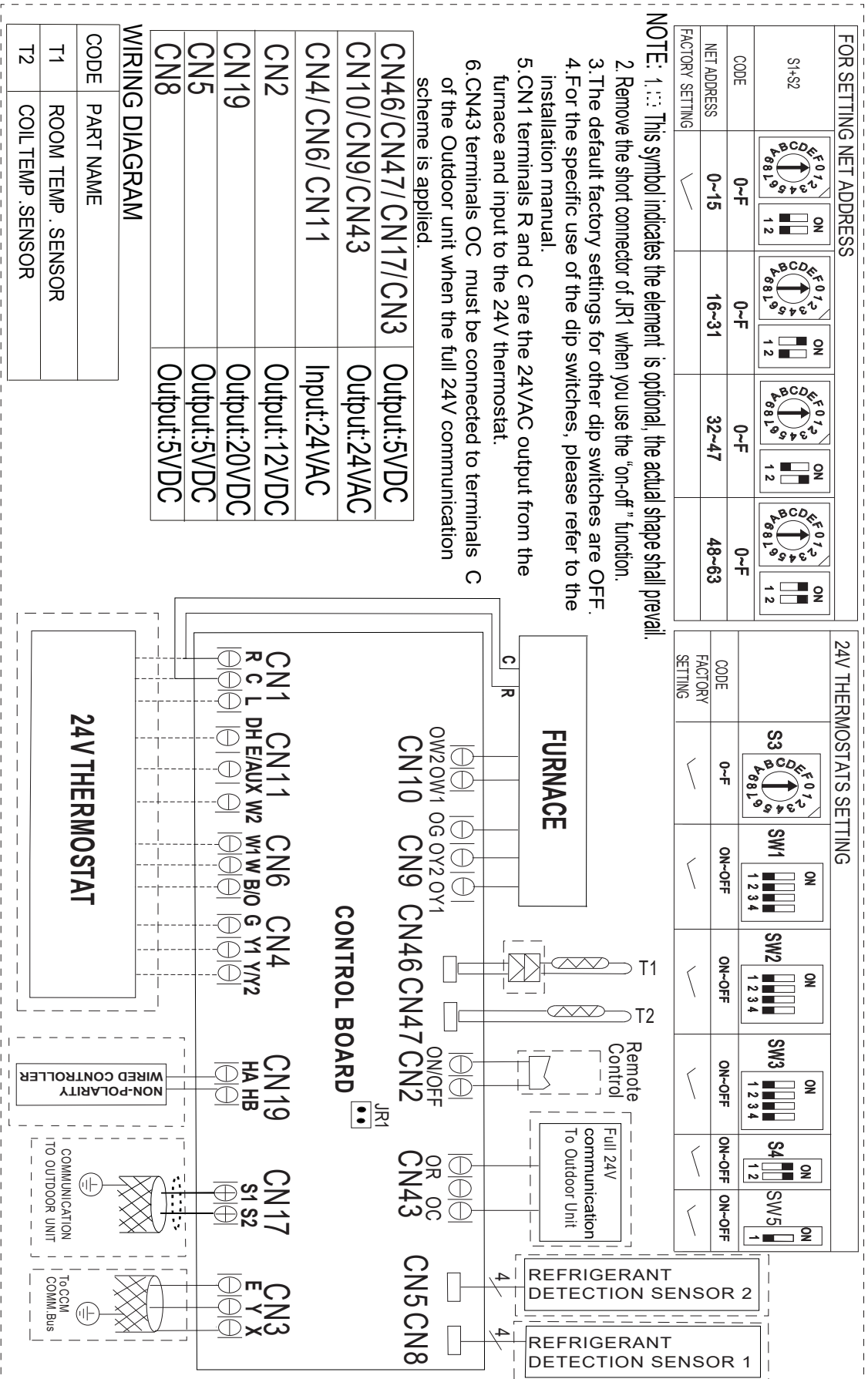


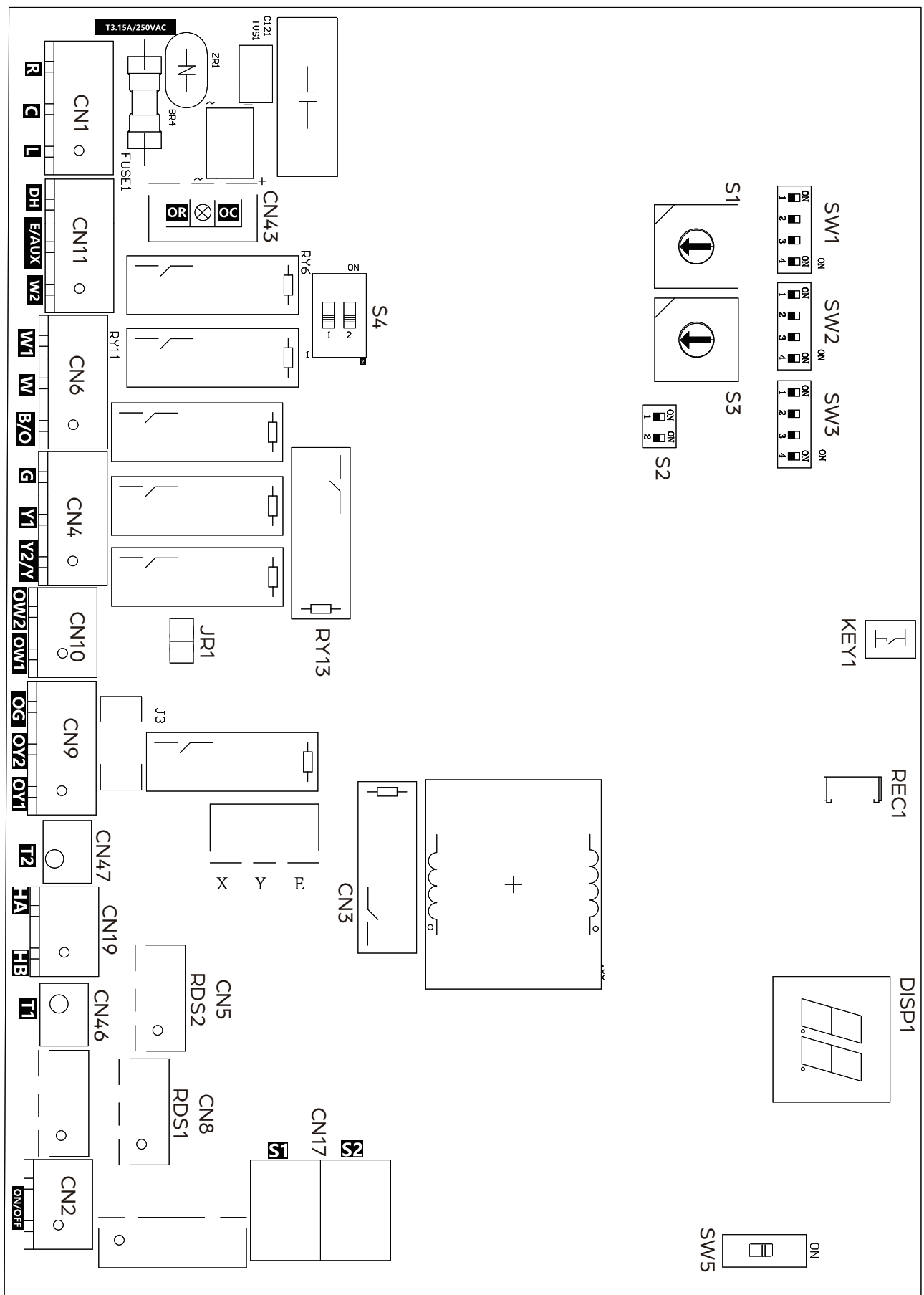
NOTE

For 2-stage furnaces using control scenario 1 and 3, S4-1 must be turned off in order for the stages to operate independently.

DIP SWITCH	CONTROL SCENARIO	FUNCTION	ON	OFF	NOTE
SW1-2	1,2,	Anti-cold blow protection	NO	[Default] YES	
SW1-3	1,2,3	Single cooling / heating and cooling options	Cooling	[Default] Cooling & Heating	
SW2-1	2	Temperature differential to activate first stage furnace heating for HP+furnace mode	4°F (2°C)	[Default] 2°F (1°C)	
SW2-4	1	Compressor	The operation of heat pump is limited by the outdoor temperature, and the operation of furnace heat is not limited. The system makes judgments according to the following rules: 1) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch. 2) The compressor can be operated when the outdoor temperature is higher than the S3 DIP switch temperature 4°F (2°C)		SW2-4 and S3 need to working together
SW2-4	2	Compressor/Auxiliary heat outdoor ambient lockout	The operation of heat pump is limited by the outdoor temperature, and the operation of auxiliary heat is not limited. The system makes judgments according to the following rules: 1) The compressor can be operated when the outdoor temperature is ≥S3 DIP switch temperature +4°F (2°C). 2) The compressor cannot be operated when the outdoor temperature is lower than the S3 DIP switch temperature.	[Default] Only one heat pump or auxiliary heat can be operated .The system makes judgments according to the following rules: 1) When the outdoor temperature is lower than the S3 DIP switch temperature, the compressor is not allowed to operated, but auxiliary heat is allowed to operate; 2) When the outdoor temperature is ≥S3 DIP switch temperature +4°F (2°C), the compressor can be operated, but auxiliary heat cannot be operated.	
Rotary Switch S3	1,2	Set outdoor temperature limitation (for auxiliary heating or compressor)	See Rotary Switch Table		
SW3-1	1	System automatically stages up capacity to satisfy set point. This adds 1 to 5°F to the user set point in the calculated control point to increase capacity and satisfy user set point	30 minutes	[Default] 90 minutes	
SW3-2	1	Cooling and heating Y/Y2 temperature differential adjustment.	Compressor slower speed	[Default] Faster Compressor	Only affects compressor
SW3-3	2	Temperature differential to activate second stage auxiliary heating(the GAP of T1 and Ts) Wire controller demand with heat pump+Electric heat working together	6°F (3°C)	[Default] 4°F (2°C)	
S4-1	1,3	Default ON	[Default] For single stage supplemental furnace heat, W1 and W2 are connected	For 2-stage supplemental furnace heat, W1 and W2 are controlled independently	Important for 2-stage furnaces.
S4-2	1,3	DH function selection	[Default] Dehumidification control not available	Dehumidification feature is enabled through the thermostat	Only valid for product which has three stage auxiliary heating.
SW5	1,2,3	Selection of the second Refrigerant Sensor	Both Refrigerant Sensor are used	[Default] Only use the first Refrigerant Sensor, interface is CN8	

WIRING DIAGRAM





24V SIGNAL CHART(COOLING & HEATING)

MODE	PRIORITY	G	Y1	Y/ Y2	B	W	W1	W2	E/ AUX	DH	DISPLAY
OFF	/	0	0	0	0	0	0	0	0	*	00
FAN	7	1	0	0	*	0	0	0	0	*	01
Cooling Stage 1	6	*	1	0	0	0	0	0	0	1	02
Cooling Stage 2		*	*	1	0	0	0	0	0	1	03
Dehumidification 1		*	1	0	0	0	0	0	0	0	04
Dehumidification 2		*	*	1	0	0	0	0	0	0	05
Heat Pump Stage 1	5	*	1	0	1	0	0	0	0	1	06
Heat Pump Stage 2		*	*	1	1	0	0	0	0	1	7
Heat Pump Stage 2		*	*	*	*	1	0	0	0	1	
Furnace	3	*	0	0	*	0	1	0	0	*	12
Furnace		*	0	0	*	0	0	1	0	*	
Furnace		*	0	0	*	0	1	1	0	*	
Furnace	4	*	1	0	1	0	1	0	0	1	
Furnace		*	1	0	1	0	0	1	0	1	
Furnace		*	*	1	1	0	1	0	0	1	
Furnace		*	*	*	*	1	1	0	0	1	
Furnace		*	*	1	1	0	0	1	0	1	
Furnace		*	*	*	*	1	0	1	0	1	
Furnace		*	1	0	1	0	1	1	0	1	
Furnace		*	*	1	1	0	1	1	0	1	
Furnace		*	*	*	*	1	1	1	0	1	
Furnace	1	*	*	*	*	*	*	*	1	*	
Heating Zone Control	2	*	1	0	1	0	*	*	0	0	13
Heating Zone Control		*	*	1	1	0	*	*	0	0	
Heating Zone Control		*	*	*	*	1	*	*	0	0	

Note:

1 = 24V Signal

0 = No 24V Signal

* = 1 or 0

The coil will turn off if the 24V input cannot meet the table.

24V SIGNAL CHART(COOLING ONLY)

MODE	PRIORITY	G	Y1	Y/ Y2	B	W	W1	W2	E/ AUX	DH	DISPLAY
OFF	/	0	0	0	0	0	0	0	0	*	00
FAN	7	1	0	0	*	0	0	0	0	*	01
Cooling Stage 1	6	*	1	0	0	0	0	0	0	1	02
Cooling Stage 2		*	*	1	0	0	0	0	0	1	03
Dehumidification 1		*	1	0	0	0	0	0	0	0	04
Dehumidification 2		*	*	1	0	0	0	0	0	0	05
Furnace	5	*	1	0	1	0	0	0	0	1	12
Furnace		*	*	1	1	0	0	0	0	1	
Furnace		*	*	*	*	1	0	0	0	1	
Furnace	3	*	0	0	*	0	1	0	0	*	
Furnace		*	0	0	*	0	0	1	0	*	
Furnace		*	0	0	*	0	1	1	0	*	
Furnace	4	*	1	0	1	0	1	0	0	1	
Furnace		*	1	0	1	0	0	1	0	1	
Furnace		*	*	1	1	0	1	0	0	1	
Furnace		*	*	*	*	1	1	0	0	1	
Furnace		*	*	1	1	0	0	1	0	1	
Furnace		*	*	*	*	1	0	1	0	1	
Furnace		*	1	0	1	0	1	1	0	1	
Furnace		*	*	1	1	0	1	1	0	1	
Furnace		*	*	*	*	1	1	1	0	1	
Furnace	1	*	*	*	*	*	*	*	1	*	
Furnace	2	*	1	0	1	0	*	*	0	0	
Furnace		*	*	1	1	0	*	*	0	0	
Furnace		*	*	*	*	1	*	*	0	0	

Note:

1 = 24V Signal

0 = No 24V Signal

* = 1 or 0

The coil will turn off if the 24V input cannot meet the table.

OPTIONAL SWITCHES AND FUNCTIONS

KEY1 Button

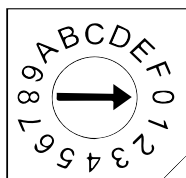
- Press KEY1 to enter the forced automatic mode, press KEY1 again to enter the forced cooling mode (LED displays FC), and press KEY1 again to shut down.
- Press and hold KEY1 under forced cooling mode (LED displays FC) for 5s to enter forced defrost mode.

S3 Rotary Switch for Temperature Protection

The S3 rotary switch is used to set the temperature protection between -22°F and 46°F. The switch defaults to OFF.

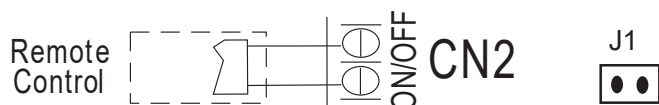
Rotary Switch Table

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



Remote Control

The unit can be turned off and on using a 3rd party remote control hardwired to CN2. Remove jumper J1 when using this function.



FINAL CHECKS



WARNING

Failure to perform the test run may result in unit damage, property damage, or personal injury.

BEFORE THE TEST RUN

A test run must be performed after the entire system has been completely installed.

Confirm the following points before performing the test:

- Indoor and outdoor units are properly installed.
- Verify dip switch settings
- Piping and wiring are properly connected.
- No obstacles near the inlet and outlet of the unit that might cause poor performance or product malfunction.
- Refrigeration system does not leak.
- Drainage system is unimpeded and draining to a safe location.
- Insulation of piping and duct is properly installed.
- Grounding wires are properly connected.
- Length of the piping and additional refrigerant capacity have been recorded.
- Power voltage is the correct voltage for the coil.
- Electrical Safety Checks – Confirm that the unit's electrical system is connected and operating correctly.
- Gas Leak Check – Check all flare nut connections and confirm the system is not leaking.
- Confirm that the low and high pressure valves are fully open.
- Check grounding work by measuring the grounding resistance by visual detection and with a multimeter. The grounding resistance must be less than 0.1 Ω .

ELECTRICAL SAFETY CHECKS

After installation, confirm that all electrical wiring is installed in accordance with local and national regulations, and according to this installation manual.

DURING TEST RUN

Using your multimeter, verify the voltage of the main power entering the system. If the main power voltage is greater than $\pm 10\%$ of the name plate voltage, turn off the unit and immediately call a licensed electrician to find and resolve the cause.



WARNING

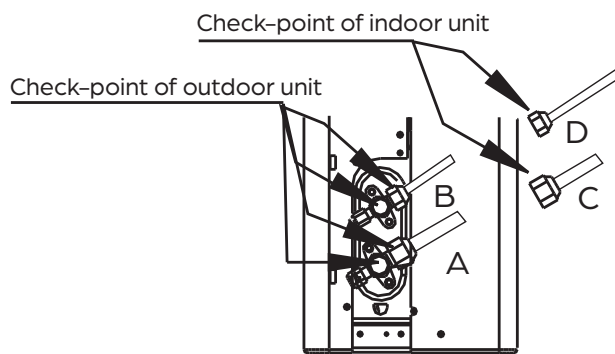
RISK OF ELECTRICAL SHOCK – All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.

GAS LEAK CHECK

There are two methods to check for gas leaks:

1. Soap and Water Method – Using a soft brush, apply a soapy water or liquid detergent to all pipe connection points on the indoor and outdoor unit. The presence of bubbles indicates a leak.
2. Leak Detector Method – If using a leak detector, refer to the device's operation manual for proper usage instructions.

GAS LEAK CHECK POINTS



A: Low pressure stop valve
B: High pressure stop valve
C & D: Indoor unit flare nuts

TEST RUN

TEST RUN INSTRUCTIONS

You should perform the test run for at least 30 minutes.

1. Connect power to the unit.
2. Press the ON/OFF button on the remote controller or wired thermostat to turn the unit on.
3. Press the MODE button to scroll through the following functions, one at a time:
 - COOL – Select lowest possible temperature.
 - HEAT – Select highest possible temperature.
4. Let each function run for 5 minutes and perform the following checks:

LIST OF CHECKS TO PERFORM	[X]
Unit is Properly Grounded	[]
All Electrical Terminals are Properly Covered	[]
Indoor and Outdoor Units are Solidly Installed	[]
All Pipe Connection Points Do Not Leak	[]
Water Drains Properly from Drain Hose without leaks	[]
All Piping is Properly Insulated	[]
Unit Performs COOL Function Properly	[]
Unit Performs HEAT Function Properly	[]
There is no abnormal noise or vibration	[]
Indoor Unit Responds to Remote Controller or Thermostat	[]

5. Double check all pipe connections. During operation, the pressure of the refrigerant system will increase. This may reveal leaks that were not present during the initial leak check. Take time during the test run to recheck all pipe connection points. Refer to *Gas Leak Check* section for instructions.
6. Ensure the condensate flows smoothly through the drain. It may take up to one (1) minute before the unit begins to drain, depending on the drainpipe. In new buildings, this should be performed before finishing the ceiling.

TROUBLESHOOTING

SAFETY PRECAUTIONS

If ANY of the following conditions occur, turn off your unit immediately!

- The power cord is damaged or abnormally warm
- You smell a burning odor
- The unit emits loud or abnormal sounds
- A power fuse blows or the circuit breaker frequently trips
- Water or other objects fall into or out of the unit

DO NOT ATTEMPT TO FIX THESE YOURSELF! CONTACT AN AUTHORIZED SERVICE PROVIDER IMMEDIATELY!

COMMON ISSUES

The following problems are not malfunctions and in most situations do not require repairs.

ISSUE	POSSIBLE CAUSES
The unit changes from COOL/HEAT mode to FAN mode	The unit may change its setting to prevent frost from forming on the unit. Once the temperature increases, the unit will start operating in the previously selected mode again.
	The set temperature has been reached, at which point the unit turns off the compressor. The unit will continue operating when the temperature fluctuates again.
Unit does not turn on when pressing ON/OFF button	The unit has a 3-minute protection feature that prevents the unit from overloading. The unit cannot be restarted within three minutes of being turned off.
	Cooling and Heating Models: If the Operation light and PRE-DEF (Pre-heating/Defrost) indicators are lit up, the outdoor temperature is too cold and the unit's anti-cold wind is activated in order to defrost the unit.
	In Cooling-only Models: If the "Fan Only" indicator is lit up, the outdoor temperature is too cold and the unit's anti-freeze protection is activated in order to defrost the unit.
The indoor unit emits white mist	In humid regions, a large temperature difference between the room's air and the conditioned air can cause white mist.
Both the indoor and outdoor units emit white mist	When the unit restarts in HEAT mode after defrosting, white mist may be emitted due to moisture generated during the defrosting process.
The indoor unit makes noises	A squeaking sound is heard when the system is OFF or in COOL mode. The noise is also heard when the drain pump (optional) is in operation.
	A squeaking sound may occur after running the unit in HEAT mode due to expansion and contraction of the unit's plastic parts.

ISSUE	POSSIBLE CAUSES
Both the indoor unit and outdoor unit make noises	Low hissing sound during operation: This is normal and is caused by refrigerant gas flowing through both indoor and outdoor units.
	Low hissing sound when the system starts, has just stopped running, or is defrosting: This noise is normal and is caused by the refrigerant gas stopping or changing direction.
	Squeaking sound: Normal expansion and contraction of plastic and metal parts caused by temperature changes during operation can cause squeaking noises.
The outdoor unit makes noises	The unit will make different sounds based on its current operating mode.
Dust is emitted from either the indoor or outdoor unit	The unit may accumulate dust during extended periods of non-use, which will be emitted when the unit is turned on. This can be mitigated by covering the unit during long periods of inactivity.
The unit emits a bad odor	The unit may absorb odors from the environment (such as furniture, cooking, cigarettes, etc.) which will be emitted during operations.
	The filters have become dirty and should be cleaned.
The fan of the outdoor unit does not operate	During operation, the fan speed is controlled to optimize product operation.

NOTE



If problem persists, contact a local dealer or your nearest customer service center. Provide them with a detailed description of the unit malfunction as well as your model number.

TROUBLESHOOTING cont.

If trouble occurs, please check the following points before contacting a repair company.

PROBLEM	POSSIBLE CAUSES	SOLUTION
Poor heating performance	The outdoor temperature is extremely low.	Use auxiliary heating device.
	Cold air is entering through doors and windows.	Make sure that all doors and windows are closed during use.
	The air filter is dirty.	Replace the air filter.
	Low refrigerant due to leak or long-term use.	Check for leaks, re-seal if necessary and top off refrigerant.

PROBLEM	POSSIBLE CAUSES	SOLUTION
Poor cooling performance	Temperature setting may be higher than ambient room temperature.	Lower the temperature setting.
	The heat exchanger coil on the indoor or outdoor unit is dirty.	Contact a servicer to clean the affected heat exchanger coil.
	The air filter is dirty.	Replace the air filter.
	The air inlet or outlet of either unit is blocked.	Turn the unit off, remove the obstruction, and turn it back on.
	Doors and windows are open.	Make sure that all doors and windows are closed while operating the unit.
	Excessive heat is generated by sunlight.	Close windows and curtains during periods of high heat or bright sunshine.
	Too many sources of heat in the room (people, computers, electronics, etc.).	Reduce amount of heat sources.
	Low refrigerant due to leak or long-term use.	Check for leaks, re-seal if necessary and top off refrigerant.
The unit is not working	Power failure	Wait for the power to be restored
	The power is turned off	Turn on the power
	The fuse is burned out	Replace the fuse
	The unit's 3-minute protection has been activated	Wait three minutes after restarting the unit
	Timer is activated	Turn timer off



NOTE

If your problem persists after performing the checks and diagnostics above, or an error code remains, turn off your unit immediately and contact an authorized service center.

ERROR AND OPERATING CODES

Error Code	Description
dF	Defrost (not an error)
FC	Forced Cooling (not an error)
EC07	ODU fan speed out of control
EC0d	ODU malfunction
EC51	ODU EEPROM parameter error
EC52	ODU coil temp. sensor (T3) error
EC53	ODU ambient temp. sensor (T4) error
EC54	COMP. discharge temp. sensor (TP) error
EC56	IDU coil outlet temp. sensor (T2B) error
ECC1	Other IDU refrigerant sensor detects leakage (Multi-zone)
EH00	IDU EEPROM malfunction
EH03	IDU fan speed out of control
EH0A	IDU EEPROM parameter error
EH0b	IDU main control board and display board communication error
EH0E	Water-level alarm malfunction
EH3A	External fan DC bus voltage is too low protection
EH3b	External fan DC bus voltage is too high fault
EH60	IDU room temp. sensor (T1) error
EH61	IDU coil temp. sensor (T2) error
EH62/EH66	Evaporator coil inlet temperature sensor T2B is in open circuit or short circuit
EH65	Evaporator coil temperature sensor T2A is in open circuit or short circuit
EHbA	Communication error between the indoor unit and the external fan module
EHb3	Communication malfunction between wire and master control
EHC1	Refrigerant sensor detects leakage
EHC2	Refrigerant sensor is out of range and leakage is detected
EHC3	Refrigerant sensor is out of range
EL01	IDU & ODU communication error
EL0C	System lacks refrigerant
EL16	Communication malfunction between adapter board and outdoor main board
FHCC	Refrigerant sensor error
FL09	Mismatch between the new and old platforms
PC00	ODU IPM module protection
PC01	ODU voltage protection
PC02	Compressor top (or IPM) temp. protection
PC03	Pressure protection (low or high pressure)
PC04	Inverter compressor drive error
PC0L	Low ambient temperature protection
----	IDUs mode conflict