

KITS COMMON TO AIR HANDLERS

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REFRIGERANT DETECTION SENSOR KIT

Installation Instructions for Refrigerant Detection Sensor Kit – Air Handler Units

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent or service agency.

CAUTION

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

WARNING



Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

CAUTION

Refrigerant Detection System installed. Unit must be powered except for service.

WARNING

RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH: System contains two independent protective earthing (grounding) terminals which both shall be properly connected and secured.

WARNING

If this appliance is conditioning a space with an area smaller than T_{Amin}, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest system.

T_{Amin} Table

Charge (lb)	10.0	15.0	20.0	25.0	30.0
Charge (kg)	4.5	6.8	9.1	11.3	13.6
Minimum Conditioned Area (ft ²)	149.9	224.9	299.9	374.8	449.8
Minimum Conditioned Area (m ²)	13.9	20.9	27.9	34.8	41.8

CAUTION

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

WARNING

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.

WARNING

For appliances using A2L refrigerants connected via an air duct system to one or more rooms, only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

WARNING

For duct connected appliances, false ceilings or drop ceilings may be used as a return air plenum if a REFRIGERANT DETECTION SYSTEM is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint.

CAUTION

Any service personnel installing, decommissioning, or performing maintenance on the unit must be properly trained with A2L refrigerants

IMPORTANT

RDS system requires 3 VA additional loading on low voltage transformer.



NOTE – Multiply values in T_{Amin} table by the Altitude Adjustment Factors to correct T_{Amin} based on installed altitude.

Altitude Adjustment Factor

Altitude (m)	0	200	400	600	800	1000	1200	1400	1600
Altitude (ft)	0	660	1310	1970	2620	3280	3940	4590	5250
Adj. Factor	1	1	1	1	1.02	1.05	1.04	1.1	1.12
Altitude (m)	1600	1800	2000	2200	2400	2600	2800	3000	3200
Altitude (ft)	5250	5910	6560	7220	7870	8530	9190	9840	10500
Adj. Factor	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.4

WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.

WARNING

Ducts connected to an appliance shall not contain a potential ignition source

NOTE – Partial units shall only be connected to an appliance suitable for the same refrigerant.

Shipping and Packing List

- 1 – Sensor mounting bracket
- 1 – Refrigerant detection sensor
- 2 – Screws
- 1 – Wire routing grommet
- 6 – Warning labels

General

This kit outlines the procedures to install the sensor mounting bracket and the installation of the sensor to the bracket, including wiring procedures.

This sensor kit is required in R454B applications, and compatible with any R-410A air handler unit as outlined in the product installation instructions. These instructions are meant to be a companion of the original product installation instructions when installing the product in R454B applications.

IMPORTANT

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

- 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 in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed 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 REFRIGERATING SYSTEM.

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

- Work 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.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the detection equipment being used is suitable for use with all applicable refrigerants, i. e. non-sparking, adequately sealed or intrinsically safe.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, the appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.
- 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.

- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out.
- Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards
- All field joints shall be accessible for inspection prior to being covered or enclosed
- 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 as applicable:
 1. The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
 2. The ventilation machinery and outlets are operating adequately and are not obstructed.
 3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
 4. Markings on the equipment should be visible and legible. Markings and signs that are illegible shall be corrected.
 5. Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
- For systems containing refrigerant, all repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged in a safe manner to avoid possibility of sparking, that no live electrical components and wiring are exposed while charging, recovering, or purging the system, and that there is continuity of earth bonding. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used that is reported to the owner of the equipment, so all parties are advised.
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant. A halide torch (or any other detector using a naked flame) shall not be used. The following detection methods are deemed acceptable for all refrigerant systems. Electronic detectors may be used to detect refrigerant, 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. Detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and that 12.5 % refrigerant is confirmed. 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. In the event refrigerant is detected by sensor, all naked flames shall be removed/extinguished. If 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 refrigerant detection.
- 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 and, since flammability is a consideration, procedures such as safely remove refrigerant following local and national regulations, purging the circuit with inert gas, evacuating (optional for A2L), purging with inert gas (optional for A2L), or opening the circuit by cutting or brazing be adhered to. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to be able to perform the required work. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and working area is well ventilated.


NOTE – Sealed electrical components shall be replaced, not repaired.

NOTE – Intrinsically safe components must be replaced, not repaired.

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

Bracket / Sensor Installation

Bracket Identification

Part Number	Bracket
626312-00	

Refer to the installation instructions for the specific unit being updated.

UPFLOW

- 1 - Locate bracket and sensor in kit.



FIGURE 1. Sensor

- 2 - Locate attachment holes in bottom-left area of the cabinet.
- 3 - Locate required hardware for installation.
- 4 - Assemble the bracket and the sensor together with the provided fasteners.
- 5 - Remove air handler unit panels.
- 6 - Install bracket/sensor assembly to the unit by lining up the holes as shown in figure 2. Make sure lance tab fits under the flange of the cabinet.



FIGURE 2

- 7 - Install the provided wire-routing grommet as shown in figure 2. Guide cable through the grommet. Cable should have a small bend (drip loop) as shown.
- 8 - Guide cable (shown in red) along center support bracket, towards the side of the cabinet if using option 1, or along the edge of the unit if routing using option 2.

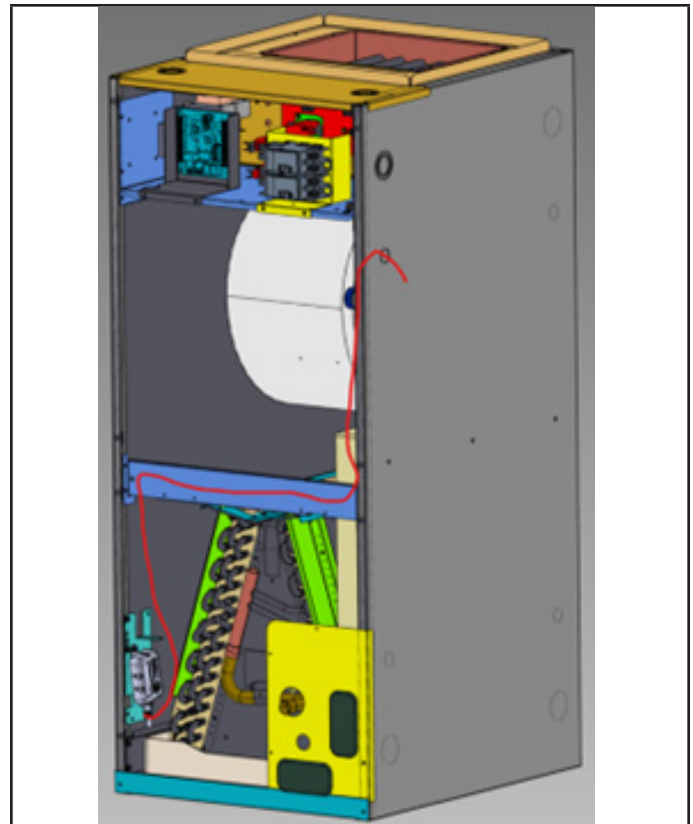


FIGURE 3. Option 1 Cable Routing

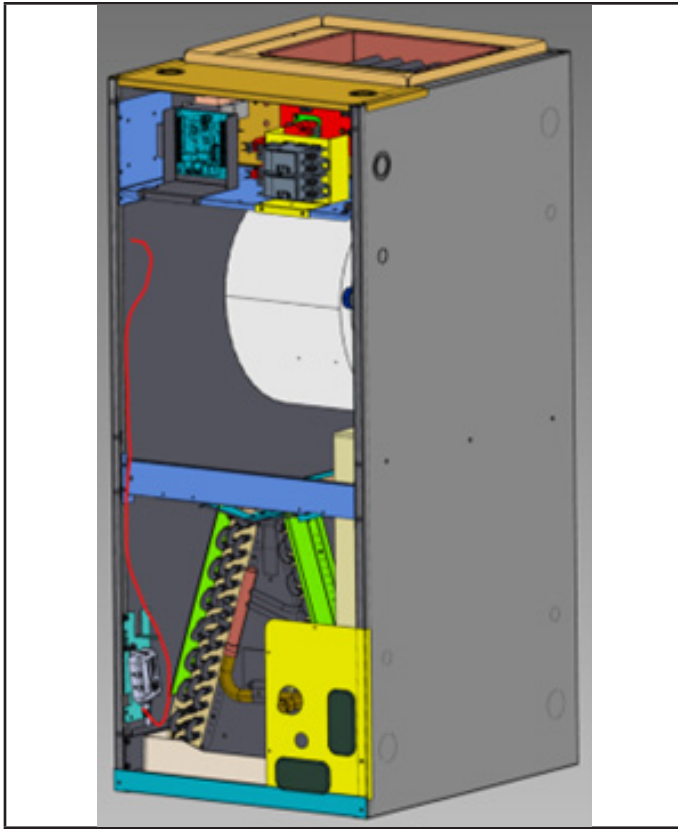


FIGURE 4. Option 2 Wire Routing

9 - Open the low voltage hole knockout and route sensor cable through opening (figure 5).

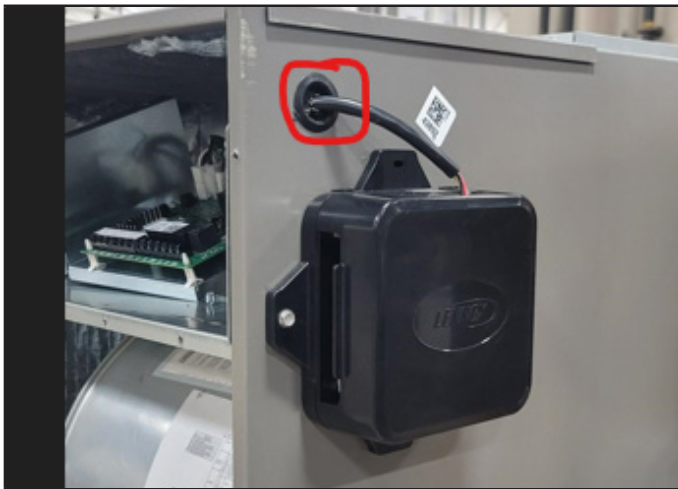


FIGURE 5

10 - Follow instructions in RDSC kit to finish configuration of RDS.

HORIZONTAL RIGHT CONFIGURATION

1 - Keep factory installed drain pans in place as shown in figure 6.

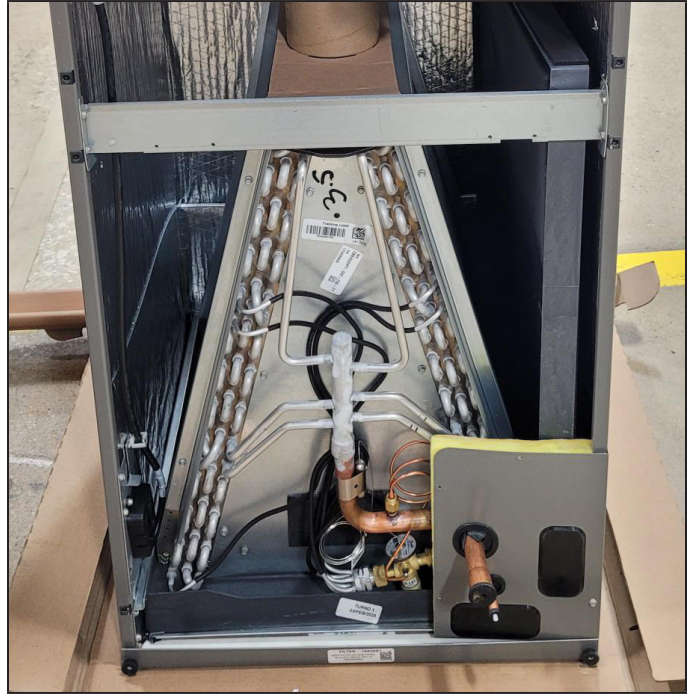


FIGURE 6

2 - Rotate unit to the right (clockwise). For more details, follow air handler unit installation instruction recommendations for conversion to horizontal right configuration.

3 - Locate sensor and bracket in kit.

4 - Locate attachment holes in bottom left area of the cabinet.

5 - Locate required hardware for installation.

6 - Assemble the bracket and sensor together with the provided fasteners. Sensor/bracket assembly shown in figure 7.



FIGURE 7

- 7 - Remove air handler unit panels.
- 8 - Install bracket/sensor assembly to the unit by lining up the holes in the center support bracket as shown in figure 8.

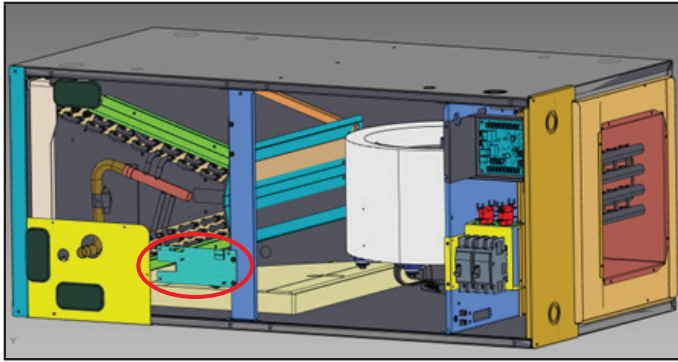


FIGURE 8

- 9 - Make sure sensor cable exits the right-hand side, as viewed from the front of the unit. The cable must go through the slotted opening in the center support bracket (see figure 9).

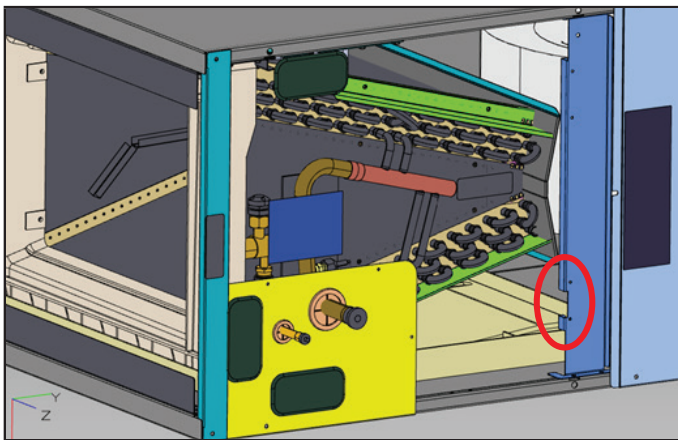


FIGURE 9

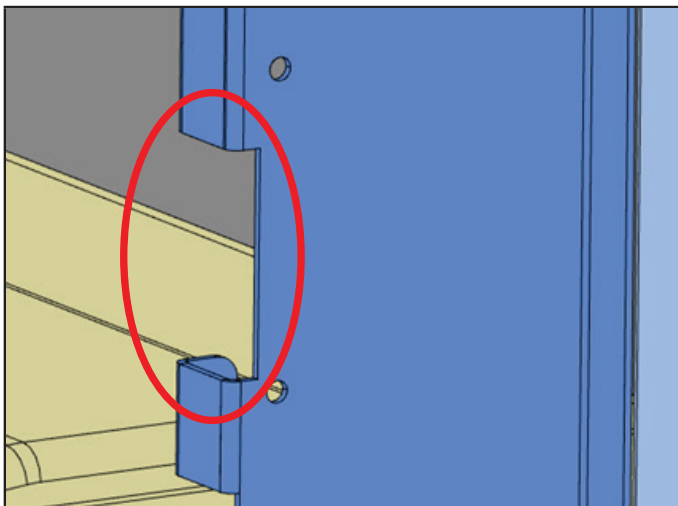


FIGURE 9. (Detail)

- 10 - Open the low voltage hole knockout and route the sensor cable through opening (figure 10).

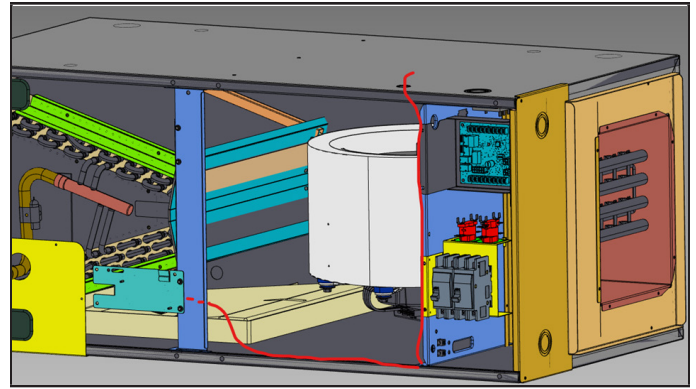


FIGURE 10

- 11 - Follow instructions in RDSC kit to finish configuration of RDS.



FIGURE 11

HORIZONTAL LEFT CONFIGURATION

- 1 - Pull coil to remove factory-installed horizontal drain pan and install it on the left-hand side.

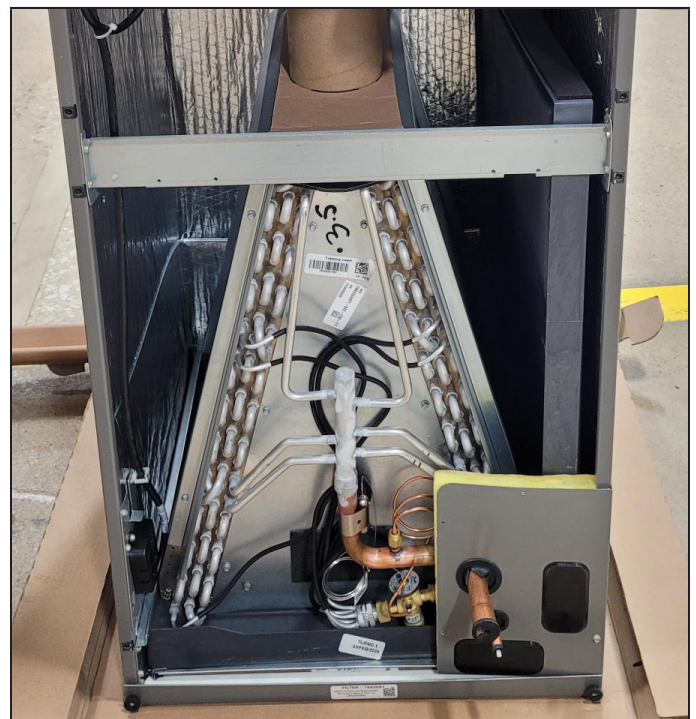


FIGURE 12. Drain Pan Location as Shipped

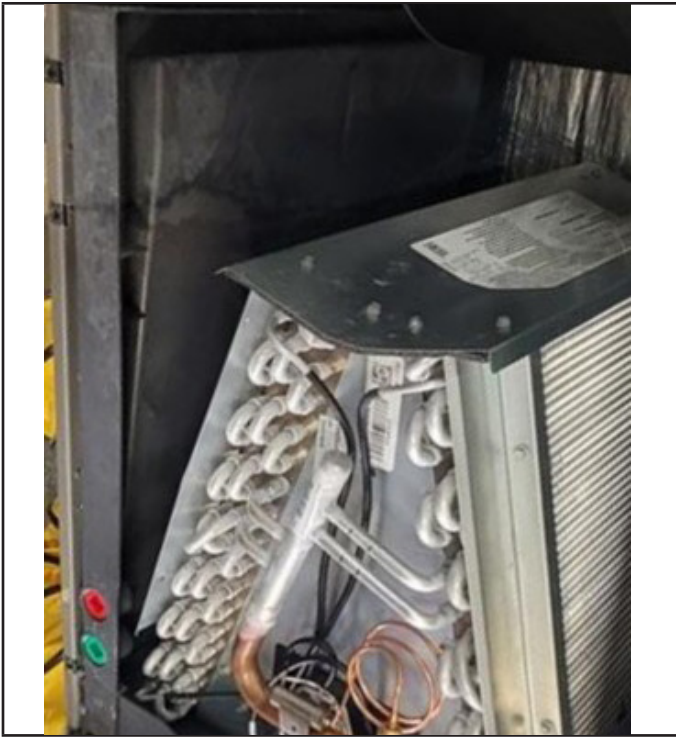


FIGURE 13. Drain Pan Moved to Left Side

- 2 - Rotate unit to the left (counter-clockwise). For more details, follow air handler unit installation instruction recommendations for conversion to horizontal left configuration.
- 3 - Locate sensor and bracket in kit.
- 4 - Locate attachment holes in bottom left area of the cabinet.
- 5 - Locate required hardware for installation.
- 6 - Assemble the bracket and sensor together with the provided fasteners. Sensor/bracket assembly shown in figure 14.



FIGURE 14

- 7 - Remove air handler unit panels.
- 8 - Install bracket/sensor assembly to the unit by lining up the holes in the center support bracket as shown in figure 15.

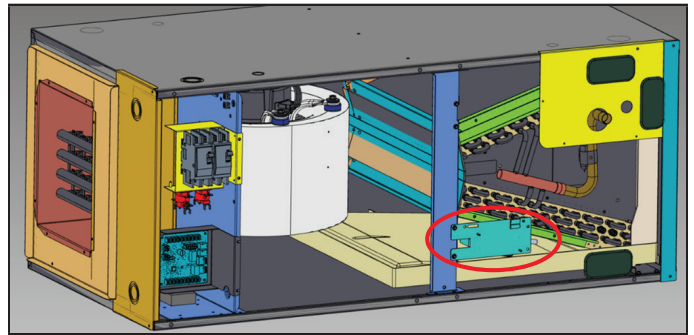


FIGURE 15

- 9 - Open the low voltage hole knockout and route the sensor cable through opening (figure 16).

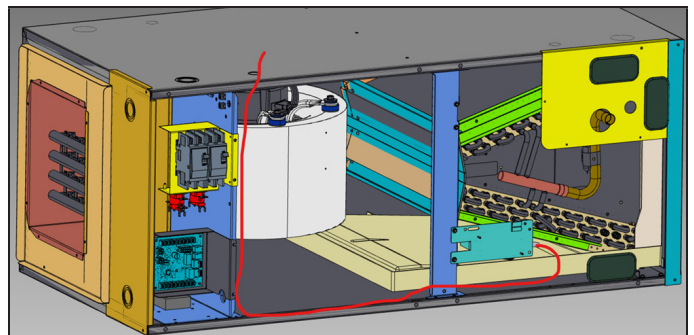


FIGURE 16

- 10 - Follow instructions in RDSC kit to finish configuration of RDS.



FIGURE 17

DOWNFLOW CONFIGURATION

- 1 - Pull coil to remove factory-installed horizontal drain pan.



FIGURE 18. Drain Pan Location as Shipped

- 2 - Perform conversion of air handler unit to downflow configuration. For more details, follow downflow kit installation procedures.



FIGURE 19. Drain Pan after Conversion

- 3 - Locate sensor and bracket in kit.
- 4 - Locate attachment holes in upper left area of the cabinet.
- 5 - Locate required hardware for installation.
- 6 - Assemble the bracket and sensor together with the provided fasteners. Sensor/bracket assembly shown in figure 20.



FIGURE 20

- 7 - Remove air handler unit panels.
- 8 - Install bracket/sensor assembly to the unit by lining up the holes in the cabinet flange as shown in figure 21.

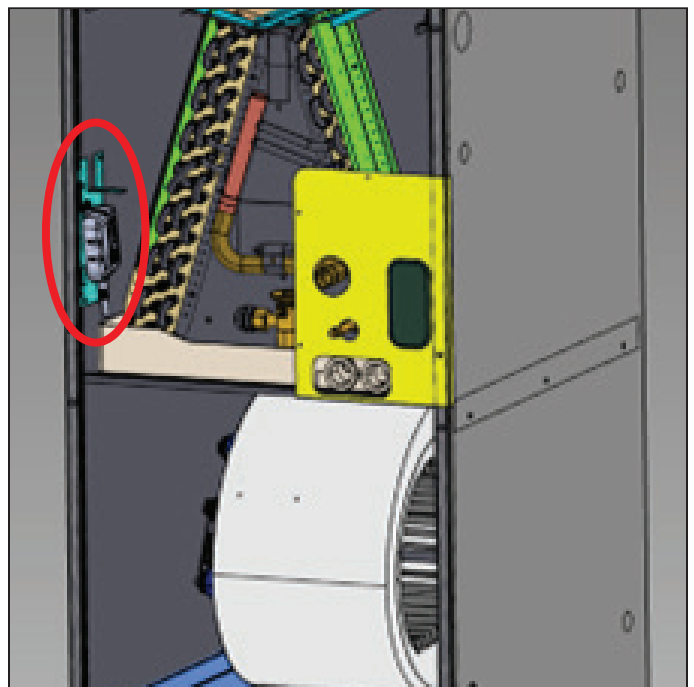


FIGURE 21

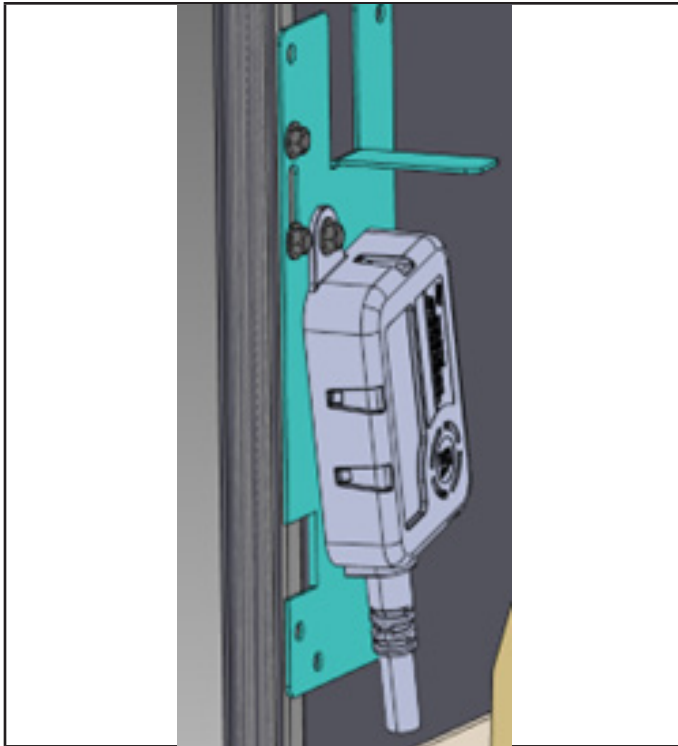


FIGURE 21. (Detail)

9 - Guide the sensor cable to one of the low voltage holes in the cabinet, using Option 1 or 2. Open the low voltage hole knockout and route the sensor cable through opening.

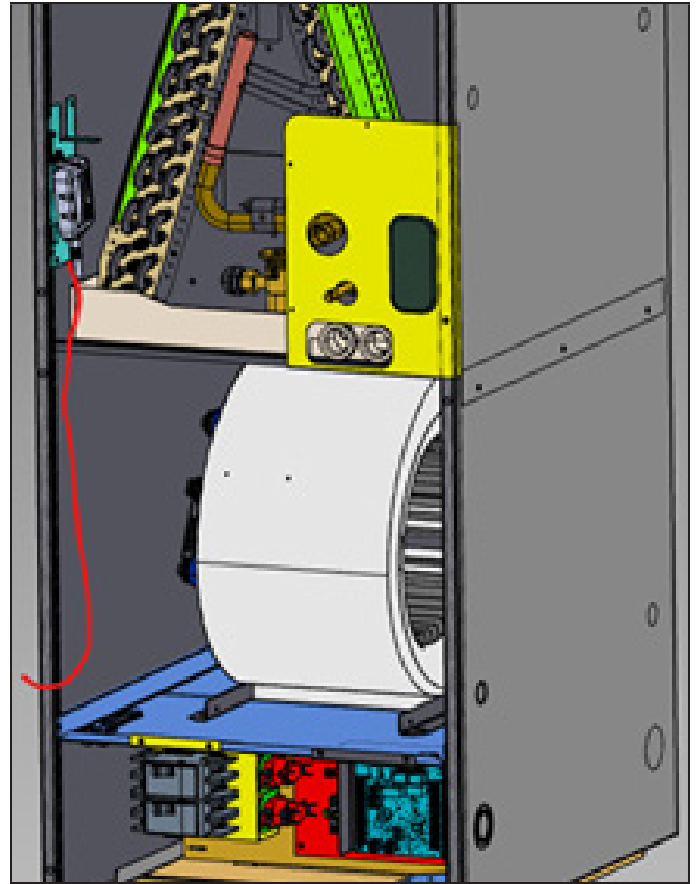


FIGURE 23. Option 2 Cable Routing

10 - Follow instructions in RDSC kit to finish configuration of RDS.

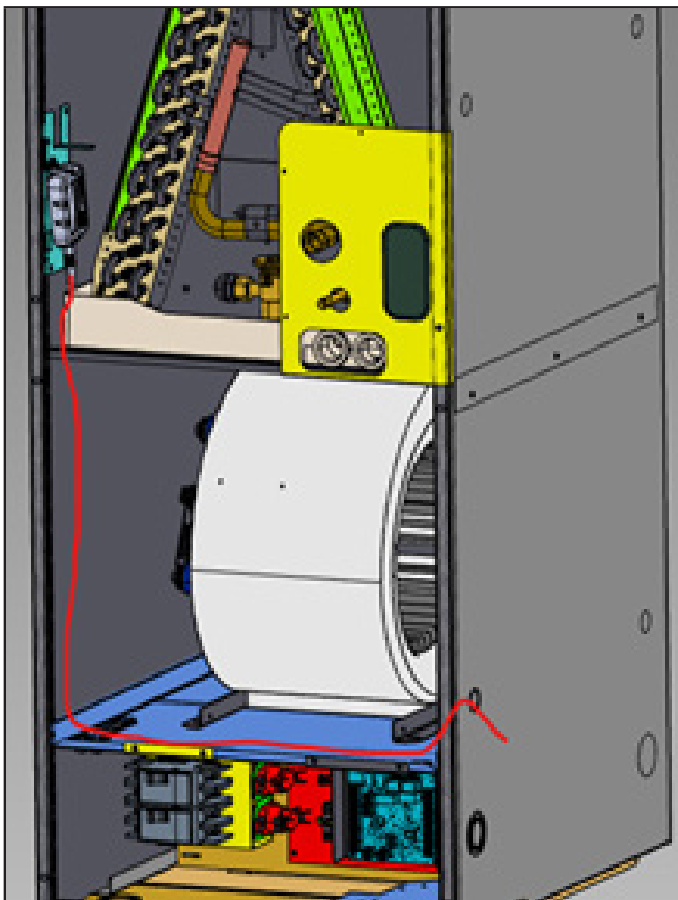


FIGURE 22. Option 1 Cable Routing

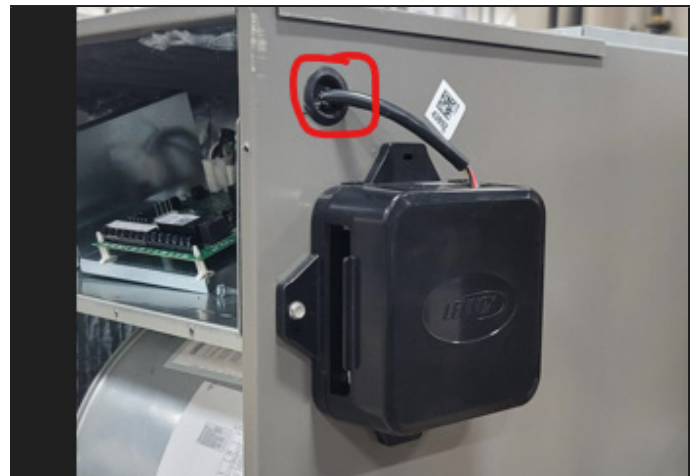


FIGURE 24

LABEL INSTALLATION

! IMPORTANT

Apply all warning labels to the plenum. Warning label application shown in figure 28 below.

OEM coils provide flexibility for installation with R-410A and R454B refrigerants.

This is applicable only during initial coil installation and is not applicable to existing installations.

When a coil is configured for R454B refrigerant during installation, the nameplate is required to be marked and all warning labels must be applied to the coil front panel before the refrigerant detection system installation is completed.

Warning labels **MUST BE VISIBLE** to service or inspection personnel. All required warning labels are provided in this Refrigerant Detection System kit. The labels that must be installed are:

107895-01, 108173-01, 107659-01, 107894-01, 107662-01, 107893-01

Please refer to the examples shown below.

1 - Nameplate Marking

Prior to installing the front panel, mark the unit nameplate to permanently identify the refrigerant configuration.

Nameplate example shown in figure 27 below.

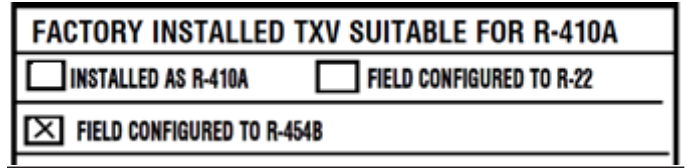


FIGURE 25

2 - Apply Warning Labels

Apply all warning labels to the front panel of the unit.

Warning label application shown in figure 26 below.



FIGURE 26

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 starting decommissioning.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- c) Before attempting the procedure, ensure that:
 - mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with instructions.
- h) Do not overfill cylinders (no more than 80% volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

- k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Sensor Maintenance

It is recommended to check the state of the sensor every 6 months, at the beginning of each cooling and heating season.

- Ensure that the sensor opening is clear and free of debris.
- Check that the sensor cable is in good condition.
- DO NOT use abrasive cleaning solutions to clean sensor opening.
- DO NOT use flammable compressed air solutions to clean the sensor opening.
- DO NOT vacuum sensor inlet opening, as this could cause damage to the sensor internal components.
- DO NOT use detergents to clean sensor.
- When cleaning the evaporator coil, remove sensor from the coil. Follow recommended coil cleaning guidelines as described in installation instructions.



FIGURE 27. Example of Clear, Unobstructed Sensor Inlet