


Installation Manual: CXF Series - Full Cased Microchannel Coils for Cooling

CXF - full-cased upflow or downflow



REFRIGERANT SAFETY GROUP A2L

 **CAUTION**

Risk of fire

This unit uses a mildly flammable (A2L) refrigerant. See [A2L refrigerant safety considerations](#) to ensure safe installation, operation, and servicing of this unit.

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About this manual

Read all sections of this manual and keep it for future reference.



WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov.

This installation manual covers the following:

- Installation of CXF coils with furnaces or JME and JMC modular air handlers

① **Note:** CXF coils may have provisions to use braze free connections. Regardless, sweat connect fittings can be used if desired. The coils are shipped with a low psi. nitrogen charge.

CAUTION

If using this coil with R-454B refrigerant, read before installation.

Certification



Assembled at a facility with
an ISO 9001:2015-certified
Quality Management
System



DS Solutions App

Johnson Controls believes in empowering our customers with unit-specific information at all times. Download the Ducted Systems Solutions Mobile App (DS Solutions App), which is available through the App Store for iOS and Google Play for Android. Users can use the DS Solutions App to scan the QR code located on the rating plate that is unique to each unit and provides information specific to the product. Take advantage of the features available for all units: Nomenclature, Literature (Technical Guide, Installation Manual and Wiring Diagrams), Parts list, Product Registration, Claims Tracking, and more.



iOS



Android

Safety

It is important to understand the safety symbols used in this manual. Read safety information carefully and follow all safety requirements to ensure correct installation.

Understanding safety symbols and instructions

Understand and pay particular attention to the signal words **DANGER**, **WARNING**, **CAUTION**, as well as the **NOTICE**, **Important**, and **Note** alerts.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING indicates a **potentially** hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION indicates a **potentially** hazardous situation, which, if not avoided may result in minor or moderate injury. It is also used to alert against unsafe practices and hazards involving only property damage.

NOTICE indicates information considered important, but not hazard-related, such as messages relating to property damage.

Important indicates information that is essential to complete a task or may result in damage to the device if not followed.

Note indicates something of special interest or importance. Notes can contain any any type of information except safety information.

Safety requirements

Read these safety requirements carefully to ensure correct installation.

WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual for assistance. For additional information, consult a qualified installer or service agency.

WARNING

The furnace area must not be used as a broom closet or for any other storage purposes, as a fire hazard may be created. Never store items such as the following on, near, or in contact with the furnace.

1. Spray or aerosol cans, rags, brooms, dust mops, vacuum cleaners, or other cleaning tools
2. Soap powders, bleaches, waxes or other cleaning compounds; plastic items or containers; gasoline, kerosene, cigarette lighter fluid, dry cleaning fluids or other volatile fluid
3. Paint thinners and other painting compounds
4. Paper bags, boxes, or other paper products

Never operate the furnace with the blower door removed. To do so could result in serious personal injury and/or equipment damage.

WARNING

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

Children must be supervised to ensure that they do not play with the appliance.

CAUTION

This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including but not limited to building, electrical, and mechanical codes.

CAUTION

This unit uses a mildly flammable (A2L) refrigerant. See [A2L refrigerant safety considerations](#) to ensure safe installation and operation of this unit.

NOTICE

To ensure a correct match for this indoor product, refer to the current *Tabular Data Sheet* for the outdoor equipment selected for the system application. If the indoor product model is not listed in the *Tabular Data Sheet* included with the outdoor unit, to access the current version of the *Tabular Data Sheet*, go to the *Residential Equipment & Supplies* section at www.simplygettingthejobdone.com or scan the QR code provided on the outdoor unit rating plate.

NOTICE

If applying this coil with an oil furnace, a 6 in. long section of duct is required between leaving-air opening of the furnace and the entering-air end of the coil.

A2L refrigerant safety considerations

CAUTION

You must read all of this section before installing this unit.

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

Any required ventilation openings must be kept clear of obstruction.

WARNING

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work, unless they have been approved by the appliance manufacturer or are suitable for use with the refrigerant being used.

Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700 °C and electric switching devices.

WARNING

Any indoor field-made refrigerant joints shall be tightness tested with no leaks detected. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 25% of the maximum allowable pressure.

The following units do not have a factory installed refrigerant detection system (RDS):

Table 1: Models without a factory installed RDS

CXF18A5A1N1	CXF30B5A3N1
CXF18B5A1N1	CXF30C5A3N1
CXF24A5A2N1	CXF36B5A4N1
CXF24B5A2N1	CXF36B5C4N1
CXF30A5A4N1	CXF36C5C4N1

NOTICE

If the total system charge is above 3.91 lbs of refrigerant in the units in [Table 1](#), then the S1-2AC06700124 RDS kit will need to be purchased and installed according to the instructions provided with the kit. If the unit is being used without an RDS kit installed then the [Room size requirements](#) section does not apply. However, the remainder of the A2L refrigerant safety considerations must be followed.

General

Table 2: Safety considerations

Item number	Safety consideration
1	Any room with an appliance containing more than 3.91 lb in a refrigerating circuit must be constructed such that any refrigerant leak cannot stagnate in a way that would create a fire or explosion hazard.
2	Before 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, item 3 to item 7 below must be adhered to before conducting work on the system.
3	Work must 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.
4	Instruct all maintenance staff and others working in the local area on the nature of work being carried out. Avoid work in confined spaces.
5	The area must be checked with an appropriate refrigerant detector before and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants: non-sparking, adequately sealed, or intrinsically safe.
6	If conducting any hot work on the refrigerating equipment or any associated parts, you must have appropriate fire-extinguishing equipment on hand. Have a dry powder or CO ₂ fire extinguisher adjacent to the charging area.
7	If conducting work in relation to the refrigerating system that involves exposing any pipework, do not use any sources of ignition in such a manner that may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, must be kept sufficiently far away from the site of installation, repair, removal, and disposal, during which refrigerant might possibly be released to the surrounding space. Before conducting any work, survey the area around the equipment to ensure that there are no flammable hazards or ignition risks. Display "No Smoking" signs.
8	Ensure the area is in the open or that it is adequately ventilated before opening the system or while conducting any hot work. The ventilation must safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
9	Ensure that the sensor is not obstructed in any way.

Room size requirements

WARNING

If the unit must be installed in a residence with a minimum room area less than what is determined to be the minimum from [Table 3](#), then that room must also not have any continuously operating open flames or other potential ignition sources. A device with a continuous pilot light may be present if that device is provided with an effective flame arrest.

① **Note:** Minimum installation height (X and W) is not applicable to this model series.

Table 3: Minimum room area

System charge (lb -oz)	Minimum total conditioned room area (ft ²) (Z)	Minimum total conditioned room area (m ²) (Y)	Minimum airflow (CFM)
4-0	120	11.14	216
4-4	127	11.84	230
4-8	135	12.54	244
4-12	142	13.23	257
5-0	150	13.93	271
5-4	157	14.63	284
5-8	165	15.32	298
5-12	172	16.02	311
6-0	180	16.72	325
6-4	187	17.41	338
6-8	195	18.11	352
6-12	202	18.81	365
7-0	210	19.50	379
7-4	217	20.20	392
7-8	225	20.90	406
7-12	232	21.59	419
8-0	240	22.29	433
8-4	247	22.99	446
8-8	255	23.68	460
8-12	262	24.38	474
9-0	270	25.08	487
9-4	277	25.77	501
9-8	285	26.47	514
9-12	292	27.17	528
10-0	300	27.86	541
10-4	307	28.56	555
10-8	315	29.25	568
10-12	322	29.95	582
11-0	330	30.65	595
11-4	337	31.34	609

Table 3: Minimum room area

System charge (lb -oz)	Minimum total conditioned room area (ft²) (Z)	Minimum total conditioned room area (m²) (Y)	Minimum airflow (CFM)
11-8	345	32.04	622
11-12	352	32.74	636
12-0	360	33.43	649
12-4	367	34.13	663
12-8	375	34.83	676
12-12	382	35.52	690
13-0	390	36.22	704
13-4	397	36.92	717
13-8	405	37.61	731
13-12	412	38.31	744
14-0	420	39.01	758
14-4	427	39.70	771
14-8	435	40.40	785
14-12	442	41.10	798
15-0	450	41.79	812
15-4	457	42.49	825
15-8	465	43.19	839
15-12	472	43.88	852
16-0	480	44.58	866
16-4	487	45.28	879
16-8	495	45.97	893
16-12	502	46.67	906
17-0	510	47.37	920
17-4	517	48.06	934
17-8	525	48.76	947
17-12	532	49.45	961
18-0	540	50.15	974
18-4	547	50.85	988
18-8	555	51.54	1001
18-12	562	52.24	1015
19-0	570	52.94	1028
19-4	577	53.63	1042
19-8	585	54.33	1055
19-12	592	55.03	1069
20-0	600	55.72	1082
20-4	607	56.42	1096
20-8	615	57.12	1109
20-12	622	57.81	1123
21-0	630	58.51	1136

① Note:

- Minimum total conditioned room area refers to the combined area of all air conditioned rooms in the residence.

If the system charge is not listed in the above table, use the formulas below to calculate the respective values:

- Minimum conditioned room area (ft²) = system charge x 29.903
- Minimum conditioned room area (m²) = system charge x 2.786
- Minimum system airflow (CFM) = system charge x 54.117

Mechanical ventilation

Table 4: Mechanical ventilation

Item number	Safety consideration
1	If installing the unit in a residence below the determined total conditioned area from Table 3 , then extra mechanical ventilation is required.

Refrigerant equipment checks

Table 5: Refrigerant equipment checks

Item number	Safety consideration
1	Where electrical components are being changed, they must be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines must be followed. If in doubt, consult the manufacturer's technical department for assistance.
2	<p>Apply the following checks to installations using flammable refrigerants:</p> <ul style="list-style-type: none"> • Ensure the actual refrigerant charge is in accordance with the room size within which the refrigerant-containing parts are installed. • Ensure the ventilation machinery and outlets are operating adequately and are not obstructed. • Ensure marking on the equipment continues to be visible and legible. Correct any markings and signs that are illegible. • Install refrigerating pipe or components in a position where they are unlikely to be exposed to any substance that may corrode refrigerant-containing components, unless the components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being corroded.

Electrical devices checks

Table 6: Electrical devices checks

Item number	Safety consideration
1	Repair and maintenance to electrical components must include initial safety checks and component inspection procedures.
2	If a fault exists that could compromise safety, then do not connect any electrical supply to the circuit until the fault is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, use an adequate temporary solution. This must be reported to the owner of the equipment so all parties are advised.
3	Initial safety checks must include: <ul style="list-style-type: none"> • Ensure capacitors are discharged: take care to avoid the possibility of sparking. • Ensure no live electrical components and wiring are exposed while charging, recovering, or purging the system. • Ensure there is continuity of earth bonding.

Detection of refrigerant

Table 7: Detection of refrigerant

Item number	Safety consideration
1	Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. Do not use a halide torch or any other detector using a naked flame.
2	The following leak detection methods are deemed acceptable for all refrigerant systems. <ul style="list-style-type: none"> • 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. Calibrate the detection equipment in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Set leak detection equipment at a percentage of the LFL of the refrigerant and calibrate to the refrigerant employed. Ensure the appropriate percentage of gas with a maximum of 25% is confirmed. • Leak detection fluids are also suitable for use with most refrigerants but avoid the use of detergents containing chlorine as the chlorine may react with the refrigerant and corrode the copper pipework. Examples of leak detection fluids are bubble method and fluorescent method agents.
3	If a leakage of refrigerant is found that requires brazing, recover all of the refrigerant from the system or isolate the leakage by means of shut-off valves in a part of the system remote from the leak. Remove refrigerant according to the <i>Removal and evacuations</i> section of the outdoor unit's <i>Installation Manual</i> .

Decommissioning

Before you begin:

Before attempting the procedure, complete the following:

- Ensure that the technician is completely familiar with the equipment and all its detail.
- Ensure to safely recover all refrigerants.
- Take an oil and refrigerant sample, in case analysis is required before reusing the recovered refrigerant.
- Ensure that electrical power is available.
- Ensure that mechanical handling equipment is available, if required, for handling refrigerant cylinders.
- Ensure that all personal protective equipment is available and being used correctly.
- Ensure that the recovery process is supervised at all times by a competent person.
- Ensure that recovery equipment and cylinders conform to the appropriate standards.

Follow the steps below to ensure the unit is correctly and safely decommissioned:

1. Isolate the system electrically.
2. Connect a recovery machine to remove refrigerant from the system.
3. Ensure that the cylinder is situated on the scales before recovery takes place.
4. Start the recovery machine and operate in accordance with instructions provided with the machine.
 - ① **Note:**
 - Do not overfill cylinders to more than 80% volume liquid charge.
 - Do not exceed the maximum working pressure of the cylinder, even temporarily.
5. When the cylinders have been filled correctly and the process completed, ensure that the cylinders and the equipment are removed from the site promptly and that all isolation valves on the equipment are closed off.
 - ① **Note:** Do not charge recovered refrigerant into another refrigerating system unless it has been cleaned and checked.

Label the equipment stating that it has been decommissioned and emptied of refrigerant. Date and sign the label. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating that the equipment contains a flammable refrigerant.

Wiring installation

NOTICE

Cap unused wiring connections.

NOTICE

The mitigation control board has a bank of DIP switches. For use with a JME air handler indoor model, both DIP switches must be in the 0 or off position. For all other indoor models, both DIP switches must be in the 1 or on position.

NOTICE

The mitigation control board has a G output and an A2L output. For Y81E, Z8ES, RL18, Y82E, Z8ET, Y82V, Z8VT, Y91E, Z9ES, RG19, Y92E, Z9ET, Y92V, Z9VT, Y9VV, Z9VV, JME, and JMC indoor models, do not use the green G output wire. Instead, use the green/blk A2L and connect it to the G terminal on the indoor equipment.

See [Connecting the wiring](#) for specific information on connecting the wiring for this coil and the chosen indoor and outdoor units.

① **Note:** The 10-pin mitigation harness is included in the loose parts kit.

Figure 1: Mitigation control wiring

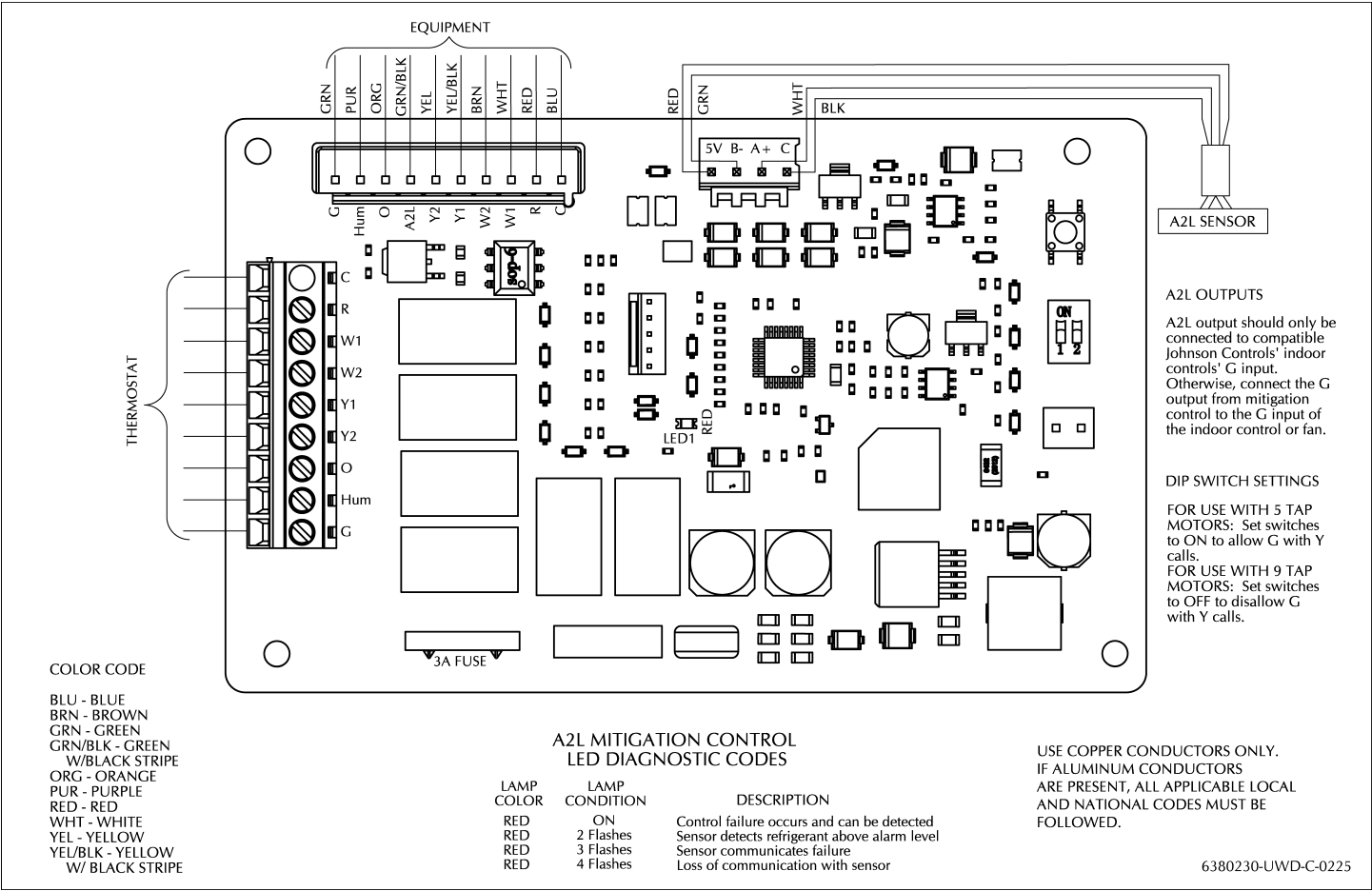
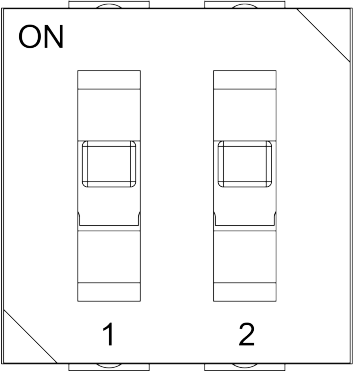


Figure 2 shows the DIP switches on the mitigation control board in the on position.

Figure 2: DIP switches in on position

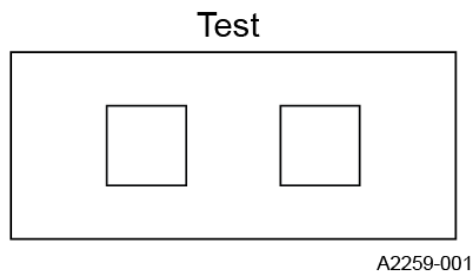


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Field-testing the sensor

1. After wiring and configuring the system, provide a Y call for cooling.
2. Simulate an A2L leak by disconnecting the A2L sensor wire from the A2L control board or shorting the test pins with a screwdriver.

Figure 3: Test pins

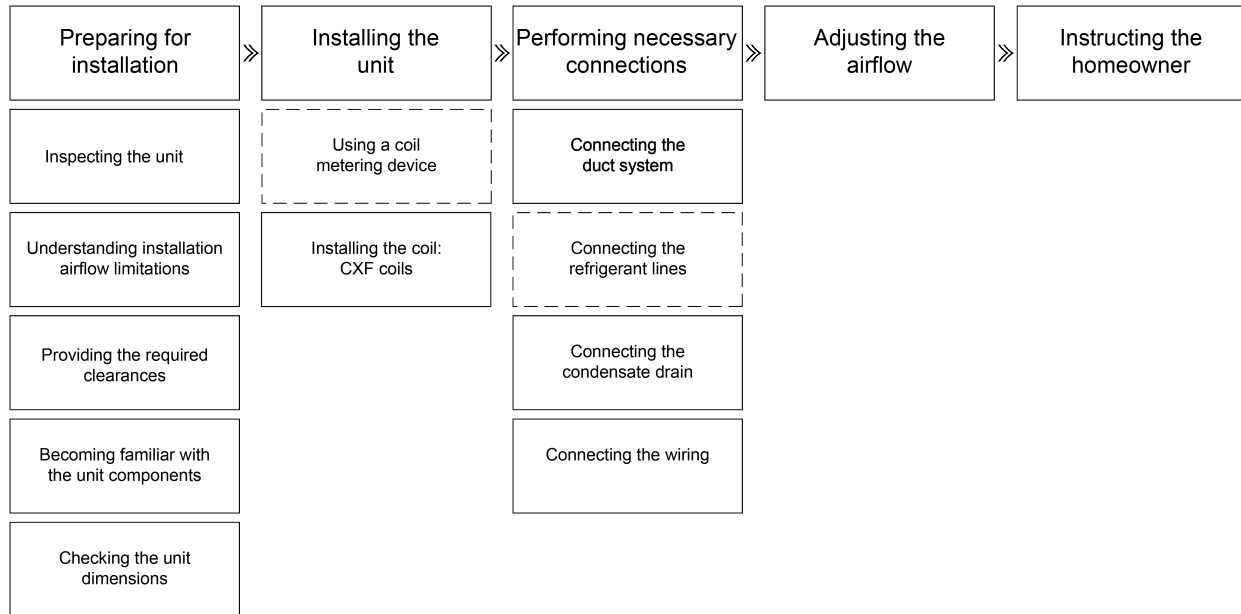


3. After 15 s, verify that the call for the compressor is removed.
4. Verify that the Y output pin has no voltage and that the G output pin has 24 VAC.
5. Reinstall the sensor or cease shorting the test pins, and verify that the system returns to cooling mode.
6. When the system is in standby mode, repeat the test for a W call for heating.
7. When testing is complete, reinstall the front cover on the control box.

Installation overview

To install the unit correctly, complete the stages outlined in [Figure 4](#). You may not need to perform tasks indicated with a dashed outline, depending on the specific installation.

Figure 4: Installation overview



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Preparing for installation

Complete the necessary preparation before you begin the installation:

1. Inspect the unit and perform a pressure check.
2. Make sure that you are aware of the installation limitations.
3. Make sure that you are aware of the required clearances.
4. Become familiar with the unit components.
5. Check the unit dimensions.

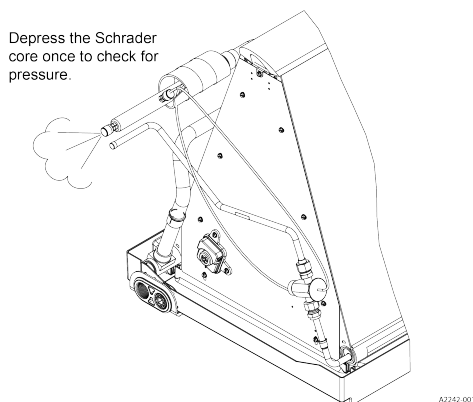
Inspecting the unit

As soon as you receive the coil, complete the following inspection checks:

1. Inspect the coil for possible damage caused during transit.
2. Check the drain pan for cracks or breakage.
3. If damage is evident, note the extent of the damage on the carrier's delivery receipt. Make a separate request for inspection by the carrier's agent in writing. Consult your local distributor for more information.
4. Check the coil to ensure it is still under pressure. See [Performing a pressure check](#).

Performing a pressure check

Figure 5: Pressure check



1. Depress the Schrader valve core once to check for pressure.

Understanding installation airflow limitations

Install the coil in accordance with all national and local safety codes and the following airflow limits:

Table 8: CXF coil airflow limits

Coil size	Outdoor unit (ton)	CFM limits	
		Minimum	Maximum
18	1 1/2	525	675
24	1 1/2	525	675
	2	700	900
30	2	700	900
	2 1/2	875	1125
36	2 1/2	875	1125
	3	1050	1350
42	3	1050	1350
	3 1/2	1225	1575
48	3	1050	1350
	3 1/2	1225	1575
	4	1400	1800
60	4	1600	1800
	5	1750	2250

Providing the required clearances

During installation, it is important to be aware of the required clearances.

Provide clearances for the following:

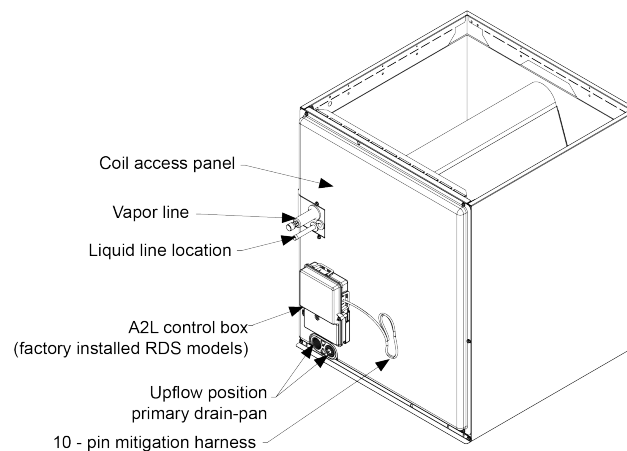
- Refrigeration piping and connections
- Maintenance and servicing access, including access for cleaning the coil
- Condensate drain line
- Removal of the coil assembly

Table 9: Required service clearances

Front	24 in.
Rear and sides	0 in.

Becoming familiar with the unit components

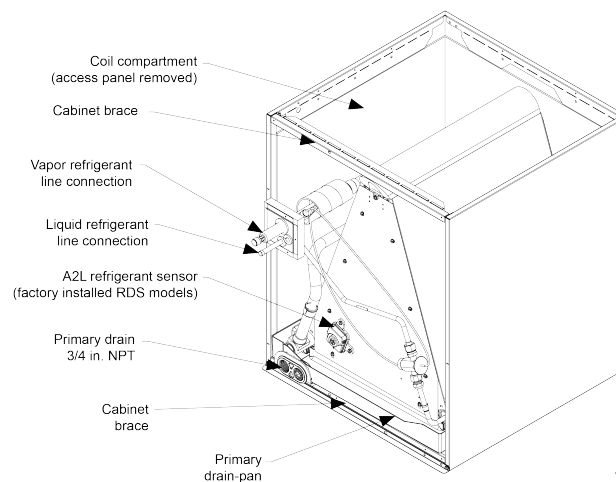
Figure 6: Component location - CXF upflow or downflow full-cased coil



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Note: The 10-pin mitigation harness is included in the loose parts kit.

Figure 7: Component location with access panel removed - CXF coils

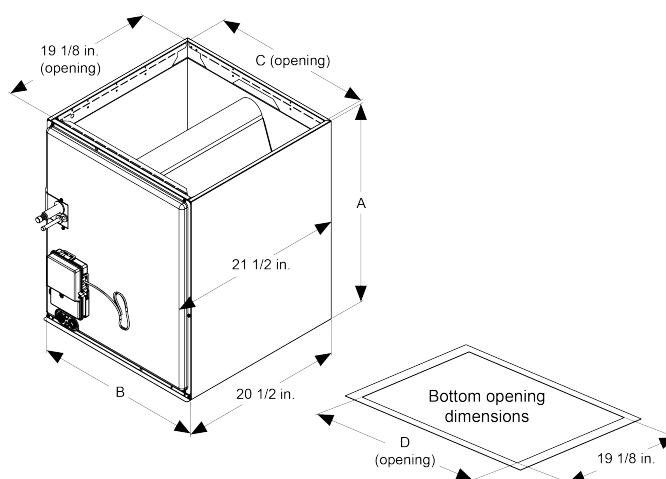


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Checking the unit dimensions

Use the following diagrams and tables to check the unit dimensions.

Figure 8: Dimensions - CXF upflow or downflow full-cased coil



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Table 10: Dimensions - CXF upflow or downflow full-cased coil

Models	Dimensions				Refrigerant connections line size	
	Height A (in.)	Width B (in.)	Opening widths		Liquid (in.)	Vapor (in.)
CXF18A5A1N1	19 1/2	14 1/2	13 1/2	13 1/2	3/8	3/4
CXF18B5A1N1	19	17 1/2	16 1/2	16 1/2		
CXF24A5A2N1	19 1/2	14 1/2	13 1/2	13 1/2		
CXF24B5A2N1	19	17 1/2	16 1/2	16 1/2		
CXF30A5A4N1	22 8/9	14 1/2	13 1/2	13 1/2		
CXF30B5A3N1	23	17 1/2	16 1/2	16 1/2		
CXF30C5A3N1	23	21	20	20		
CXF36B5A4N1	23	17 1/2	16 1/2	16 1/2		
CXF36B5C4N1	23	17 1/2	16 1/2	16 1/2		
CXF36C5C4N1	23	21	20	20		
CXF42C5C5S1	25	21	20	20		
CXF48C5A6S1	28 4/5	21	20	20		
CXF48C5C6S1	28 4/5	21	20	20		
CXF48D5C6S1	32 4/5	24 1/2	23 1/2	23 1/2		
CXF60C5C7S1	33	21	20	20		
CXF60D5C7S1	32 4/5	24 1/2	23 1/2	23 1/2		

Note:

- Refrigerant line sizes may require larger lines for extended line lengths. Refer to *Application Data part number 247077*.
- The adapter fitting must be field installed for any refrigeration piping sizes not shown in the table.
- Refer to the *Technical Guide* for the outdoor unit for the correct refrigeration piping size.

Installing the unit

Complete the necessary steps to install the unit. The installation approach varies depending on what coil model you are installing.

1. Install a coil metering device where applicable.
2. Install the coil.

Using a coil metering device

You must install a TXV in the field, unless you are using a coil with a factory-installed TXV. Refer to the *Technical Guide* for outdoor units for information on the TXV required for the indoor coil. Install the TXV kit before installing the coil and brazing the refrigeration piping. For TXV installation, refer to the *Installation Manual* provided with the TXV kit and see [Installing a thermal expansion valve \(TXV\)](#).

ⓘ Note: Do not install the TXV sensing bulb until you have completed the brazing and the piping has cooled.

Some outdoor sections require a TXV. Do not install the Schrader valve core if a TXV is installed, because the TXV equalizer line attaches to the equalizer connection port or suction line port.

CAUTION

Coil under pressure

Verify that pressure has been released by depressing the Schrader valve core shown in [Figure 5](#). The coil requires a metering device to be added. Refer to the outdoor unit documentation for the correct TXV to use.

NOTICE

To prevent moisture and contaminants from entering the system, the coil must not be open to the atmosphere for extended periods of time. If the coil cannot be brazed into the refrigeration system during a routine installation period, the ends must be temporarily closed or plugged. For a short term delay, use masking tape over the ends of the copper tubing to close the tube from the air. For a longer term delay, use plugs or caps. There is no need to purge the coil if this procedure is followed.

Installing a thermal expansion valve (TXV)

Before you begin:

The following are basic steps for installing a TXV kit on CXF coils. For detailed instructions, refer to the *Installation Manual* provided with the TXV kit.

- **Important:** Refer to the *Technical Guide* or *Tabular Data Sheet* for the outdoor unit to determine the correct TXV kit to use on this product.

CAUTION

Outdoor unit model numbers ending with an H have a factory-installed hard start kit, required when installing a TXV. Outdoor unit model numbers with no H ending may require a hard start kit. Refer to the *Technical Guide* or *Tabular Data Sheet* for the outdoor unit.

Complete the following steps to install the TXV kit:

1. Relieve the holding charge by depressing the Schrader valve core on the suction manifold stub-out.

2. After discharging the holding charge completely, loosen and remove the Schrader valve core.
3. Place a backup wrench on the distributor, then loosen and remove the brass distributor nut. Retain the brass nut for use on the liquid line. Keep the PTFE washer in place and discard the sealing disk.
4. Install the TXV onto the distributor assembly with the supplied fittings. Ensure the PTFE washer is seated in the distributor. Hand tighten and turn an additional 1/4 turn to seal. See [Figure 9](#).

Note: Do not overtighten the fittings.

CAUTION

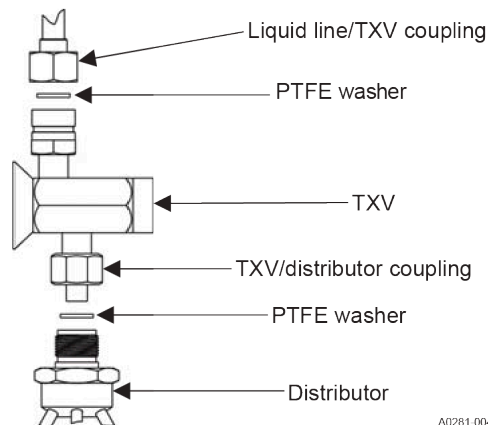
Do not over torque. Do not use slip joint pliers. This will distort the aluminum distributor and the brass fitting (potentially causing leaks).

5. Slide the nut removed in Step 3 over the supplied liquid line. Place the supplied PTFE washer from the TXV kit in place on the TXV and install the liquid line to the top of the TXV. Adjust the distributor assembly so the liquid line aligns with the hole in the access panel. See [Figure 9](#). Hand tighten the liquid line and apply an additional 1/4 turn to seal.

CAUTION

The Schrader valve core **must not** be installed into the suction line TXV equalizer line fitting. Poor system performance or system failure could result.

Figure 9: TXV installation



6. Install the TXV equalizer line onto the vapor line by hand tightening the 1/4 in. SAE coupling nut to the equalizer fitting and apply an additional 1/3 turn to seal. See [Figure 10](#).

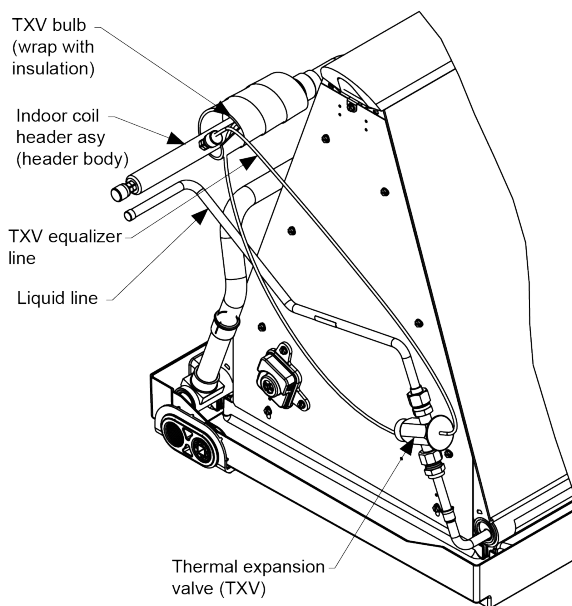
CAUTION

Mount the TXV temperature sensing bulb after the vapor line is brazed and sufficiently cooled.

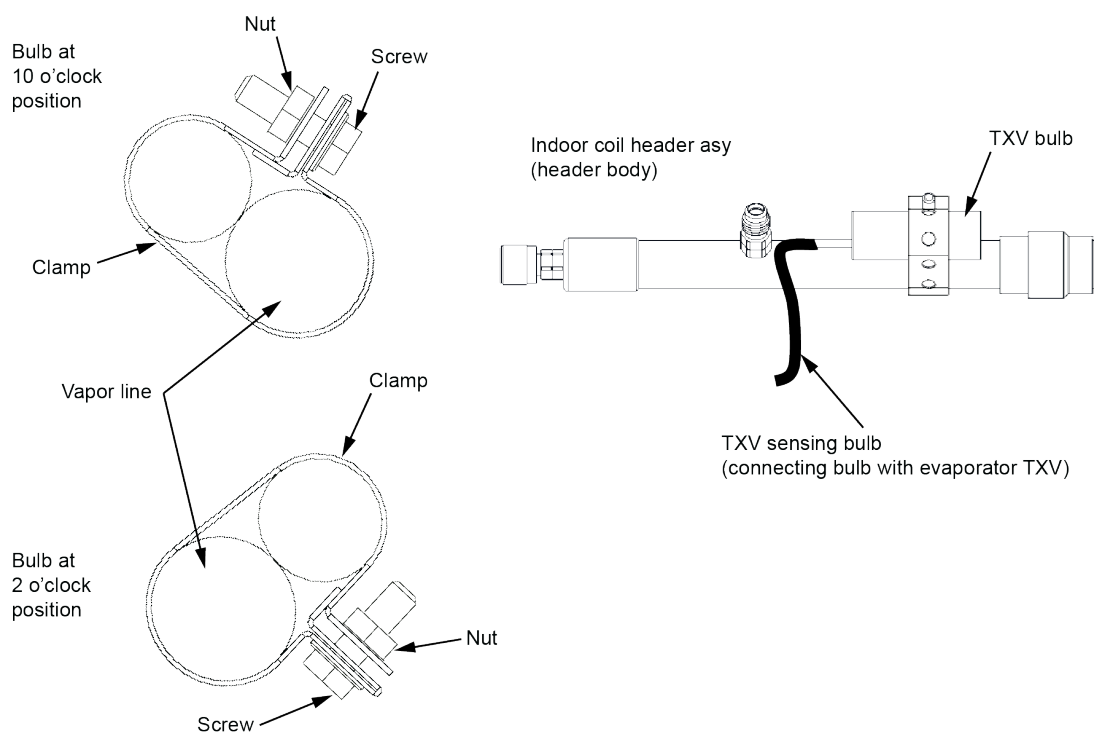
7. Route the temperature sensing bulb tube for the TXV toward the vapor line header and the TXV equalizer tube connection port on the vapor line header.

8. Install the TXV bulb to the vapor line near the TXV equalizer tube connection port, using the bulb clamps supplied with the TXV assembly. Ensure that the bulb is making maximum contact. See [Figure 10](#) and [Figure 11](#) and complete the following steps:
 - a. Install the TXV bulb on the vapor line suction header near the TXV equalizer tube connection port. Ensure that the bulb is installed at a 10 o'clock or 2 o'clock position.
 - b. Insulate the TXV bulb using the thermal insulation provided to protect it from the effect of the surrounding ambient temperature. Cover the bulb completely to insulate it.

Figure 10: TXV bulb and equalizer line installation



A2247-001

Figure 11: Correct bulb location for TXV

A1672-001

9. After installing the refrigeration piping, leak test the system.

Verifying TXV installation

Before continuing with the installation, ensure you have verified everything on the following checklist:

TXV checklist

- ☐ Is the coil metering device installed correctly?
- ☐ Is the correct TXV installed according to the *Technical Guide* or *Tabular Data Sheet* for the outdoor section?
- ☐ Is the TXV temperature bulb positioned correctly?
- ☐ Is the TXV temperature bulb insulated?
- ☐ Is the TXV equalizer line connected?

Installing the coil: CXF coils

It is important to understand the following to install CXF coils correctly:

- How to use the duct flanges if needed
- The requirements for different installation applications

Using the duct flanges: CXF coils

Duct flanges are built into the coil cabinet of CXF coils. If duct flanges are necessary, complete the following steps:

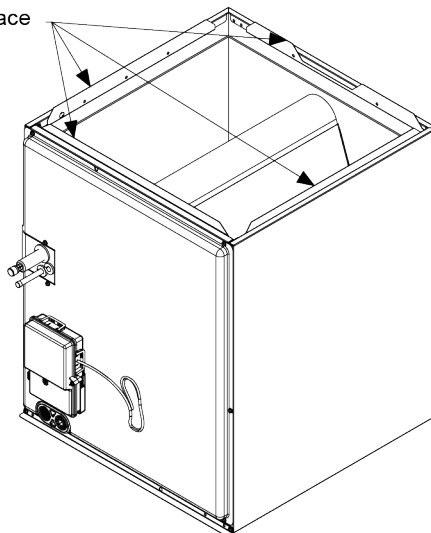
- ① **Note:** If you do not use the duct flanges, leave them as received from the factory, folded down or uninstalled.
1. For **integrated duct flanges**, fold the flanges outward and secure the flanges in place using screws as shown in [Figure 12](#).
 2. Use the tie plates to secure the coil to the furnace or modular air handler as shown in [Figure 13](#), [Figure 14](#), [Figure 15](#), or [Figure 16](#).

NOTICE

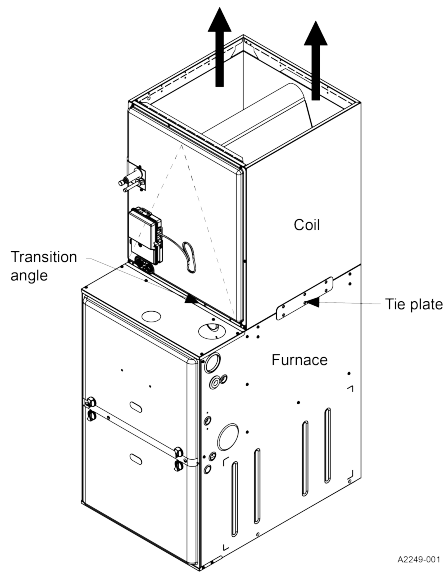
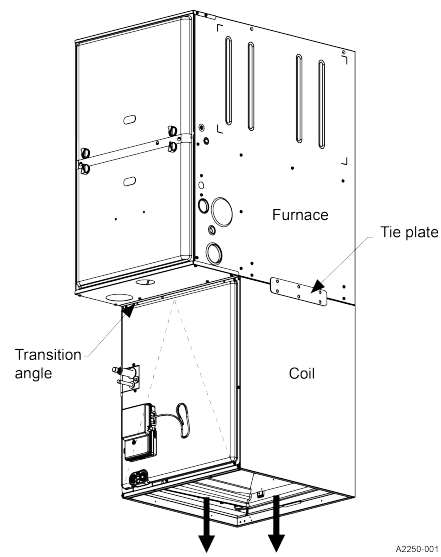
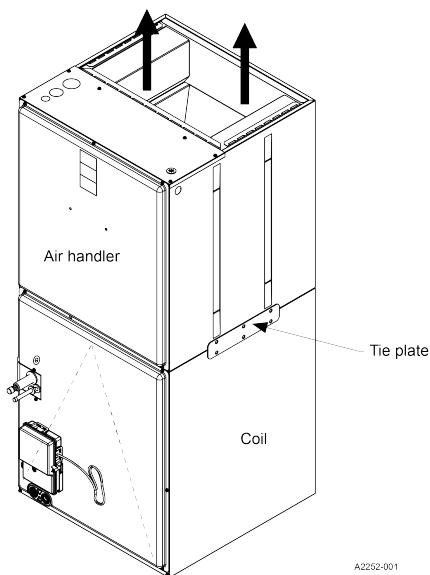
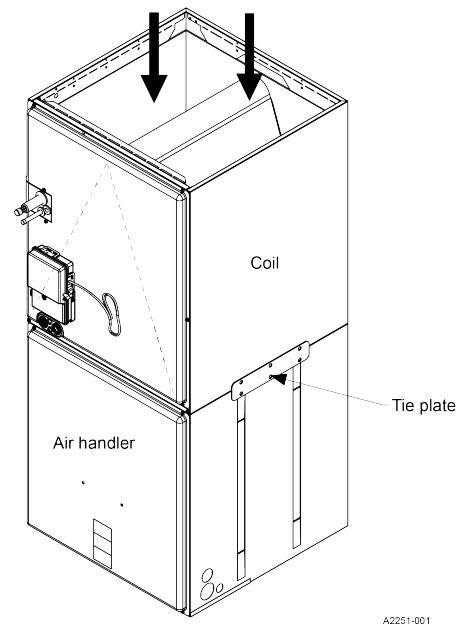
For horizontal applications, the coil cabinet can be installed so that it is slightly pitched toward the front or drain connection end of coil. Ensure that the horizontal pan drains water adequately before completing the unit installation.

Figure 12: Duct flanges - CXF coils

Flanges bent by 180°
on casing and brace



A2248-001

Figure 13: Vertical upflow applications with furnaces**Figure 14: Vertical downflow applications with furnaces****Figure 15: Vertical upflow applications with modular air handlers****Figure 16: Vertical downflow applications with modular air handlers**

Repositioning the transition angle

The coil cabinet has a factory-installed transition angle on the bottom front side of the cabinet. For **downflow applications with a furnace**, you must reposition this angle to the top front side of the cabinet.

- ① **Note:** For installation with a modular air handling unit, remove the transition angle and discard it.
1. Remove the two screws that fasten the transition angle to the bottom front side of the cabinet.
 2. Remove the two screws from the top front side of the cabinet.
 3. Remove the transition angle, rotate the transition angle 180° end for end, and secure the transition angle to the top front side of the cabinet.

Performing necessary connections

It is important to make the following connections during unit installation:

1. Connect the duct system.
2. Connect the refrigerant lines.
3. Connect the condensate drain.
4. Connect the wiring.

Connecting the duct system

You can handle air supply and return in several ways. Use the option best suited to the installation. You can use upflow, horizontal, or downflow applications.

Adhere to the following:

- The vast majority of problems encountered with heating and cooling systems can be linked to incorrectly designed or installed duct systems. To help ensure a successful installation, correctly design and install the duct system.
- Use flexible duct connectors to minimize the transmission of vibration or noise into the conditioned space.

WARNING

For CXF coils, use 1/2 in. screws to connect duct work to cabinet. If pilot holes are drilled, drill only through field duct and unit flange.

- Where the return air duct is short or sound may be a problem, use acoustical duct liner inside the duct. You must insulate duct work that runs through an unheated space during the heating season or an uncooled space during the cooling season. It is best practice to use a vapor barrier to prevent absorption of moisture from the surrounding air into the insulation.
- Correctly size the supply air duct by using a transition to match the unit opening. Suspend all ducts using flexible hangers and never fasten ducts directly to the structure. Fabricate and install duct work in accordance with local and/or national codes. This includes the standards of the National Fire Protection Association for Installation of Air Conditioning and Ventilating Systems, NFPA No. 90B.

CAUTION

Equipment should never be operated without filters.

Connecting the refrigerant lines

CAUTION

The coil is under inert gas pressure. Relieve pressure from the coil by depressing the Schrader core at the end of the suction manifold stub-out.

NOTICE

Avoid handling aluminum coil components after handling the copper refrigeration piping or other tubing without first cleaning your hands.

NOTICE

Route the refrigeration piping to the coil in a manner that does not obstruct service access to the coil, air handling system, furnace flue, or filter.

Depending on the coil model and application, it is possible to connect the refrigerant lines in one of two ways: by brazing the connections or by using non-braze connections.

Some coil models have lines that are expanded to receive the field refrigeration piping, and some coil models have straight piping connections ready to accept braze-free connectors. You can still use these straight piping connections for brazing, but you need to expand the pipe in the field using a swage tool or alternatively you can use a sweat coupling.

Make suction and liquid line connections outside of the cabinet. Leave the tubing connection panel attached to the cabinet. If you are brazing the connections, remove the coil access panel.

Brazing the refrigerant lines

The following steps explain how to braze the refrigerant lines. For braze-free connections, see [Using braze-free refrigerant line connections](#).

CAUTION

Dry nitrogen should always be supplied through the tubing while it is being brazed, because the temperature required is high enough to cause oxidation of the copper unless an inert atmosphere is provided. The flow of dry nitrogen should continue until the joint has cooled. Always use a pressure regulator and safety valve to insure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

1. Remove the grommets where tubes exit the cabinet to prevent burning them during brazing. In some units, the vapor line grommet may be shipped as a loose part with the unit.
2. Cut the end of the suction tube using a tube cutter. Place the tube cutter as close as possible to the end of the tube to allow as much depth as possible for the connection and brazing of the suction line. To ensure that the suction line fits into the connection, deburr the stub-out, including inner pressure protrusion from cutting.
3. If the coil has a factory-installed TXV, go to Step 5. If the coil does not have a factory-installed TXV, install the TXV kit. See [Installing a thermal expansion valve \(TXV\)](#) for detailed instructions.

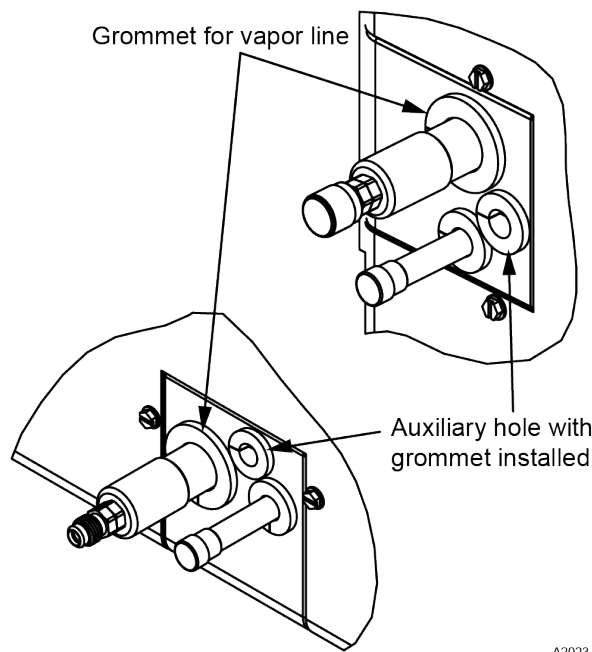
4. If the coil has a factory-installed TXV, remove the liquid line copper cap that is soft soldered onto the outside of the 3/8 in. stub protruding from the front of the coil cabinet tubing panel as follows:
 - a. Screw a sheet metal screw into the center of the cap.
 - b. Apply a small amount of heat to the cap while pulling on the screw using slip joint pliers.
5. Insert the liquid line and the suction line into the coil connections at the coil cabinet tubing panel.
6. Wrap a water-soaked rag around the coil connection tubes inside the cabinet to avoid transferring excess heat to the coil and the TXV.
7. Purge the refrigerant lines with dry nitrogen during brazing.

NOTICE

All indoor coil connections are copper-to-copper and must be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. **Do not** use soft solder.

8. Braze the suction line and the liquid line, and allow the joints to cool.
9. Secure the sensing bulb and equalizer line capillary tubes with nylon cable ties to prevent leaks from the tubes rubbing.
10. Install the grommets to the lines carefully to prevent air leakage. In some units, the vapor line grommet may be shipped as a loose part with the unit. See [Figure 17](#).
11. Refer to the *Installation Manual* for the outdoor unit and complete the leak check, evacuation, and charging according to the instructions provided. Check all field-brazed joints and metering device connections.
12. Locate the A2L refrigerant sensor mounted to the coil delta plate. Run the sensor wire through the extra hole in the tubing access panel.
13. Attach the coil access panel to the cabinet.
14. Connect the A2L refrigerant sensor wire to the RDS control board mounted on the coil access panel.
15. Ensure that lines are sound isolated by using appropriate hangers or strapping.

Figure 17: Vapor line grommet



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Using braze-free refrigerant line connections

The following steps explain how to use braze-free refrigerant line connections. For brazed connections, see [Brazing the refrigerant lines](#).

1. Remove the grommets where suction tube exits the cabinet. In some units, the vapor line grommet may be shipped as a loose part with the unit.
2. Remove the coil door but leave the tubing access panel in place.
3. Cut the end of the suction tube using a tube cutter. Place the tube cutter as close as possible to the end of the tube to allow as much straight tubing as possible for the braze-free connector. Deburr the stub-out after cutting.
4. Install the TXV kit, leaving the liquid line uninstalled for now. See [Installing a thermal expansion valve \(TXV\)](#) for detailed instructions.
5. Fit a braze-free connector and the field suction line into the coil suction line connection at the coil cabinet tubing panel. Complete the suction line connection.
6. Install the liquid line on the TXV. Fit a braze-free connector and the field liquid line into the coil liquid line connection at the coil cabinet tubing panel. Complete the liquid line connection.
7. Secure the TXV sensing bulb and equalizer line capillary tubes with nylon cable ties to prevent leaks from the tubes rubbing.
8. Install the grommets to the lines carefully to prevent air leakage. In some units, the vapor line grommet may be shipped as a loose part with the unit. See [Figure 17](#).
9. Refer to the *Installation Manual* for the outdoor unit and complete the leak check, evacuation, and charging according to the instructions provided. Check all field braze-free connection joints and metering device connections.
10. Locate the A2L refrigerant sensor mounted to the coil delta plate. Run the sensor wire through the extra hole in the tubing access panel.
11. Attach the coil access panel to the cabinet.
12. Connect the A2L refrigerant sensor wire to the RDS control board mounted on the coil access panel.
13. Use appropriate hangers or strapping to ensure that the lines are sound isolated.

Connecting the condensate drain

Adhere to the following:

- Pitch all drain lines 1/4 in./ft away from the unit drain pan and make sure that the drain lines are no smaller than the coil drain connection.
- Route the drain line so that it does not impede access to the coil, furnace, air handling system, or filter and is not exposed to freezing temperatures.
- Instruct the homeowner that the indoor coil drain pan must be inspected and cleaned regularly to prevent odors and ensure proper drainage.

NOTICE

For CTF and CTM coils, when the coil is installed in an attic or above a finished ceiling, an auxiliary drain pan must be provided under the coil as is specified by most local building codes.

- Install the coil level or pitched slightly toward the drain end. Suggested pitch must not exceed 1/4 in./ft of coil.
- Note that you can remove drain plugs using a standard 3/8 in. drive socket ratchet or needle-nose pliers.
- If the coil has a secondary drain, pipe it to a location that gives the occupant a visual warning that the primary drain is clogged. If a secondary drain is not used, you must plug the secondary drain. See [Figure 18](#), [Figure 19](#), or [Figure 20](#).

⚠ CAUTION

Avoid double trapping.

⚠ CAUTION

Threaded drain connections must be hand tightened, plus no more than one turn.

- Do not use PTFE tape, pipe thread compound, or other sealants. Use of a sealant can cause damage and premature failure of the drain pan.

NOTICE

If the coil is installed in a draw-through application (modular blower), the installer must trap the primary and secondary drain line. If the secondary drain line is not used, it must be plugged.

Figure 18: Drain traps

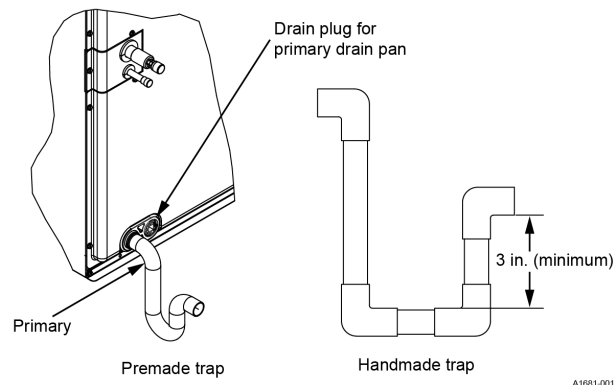
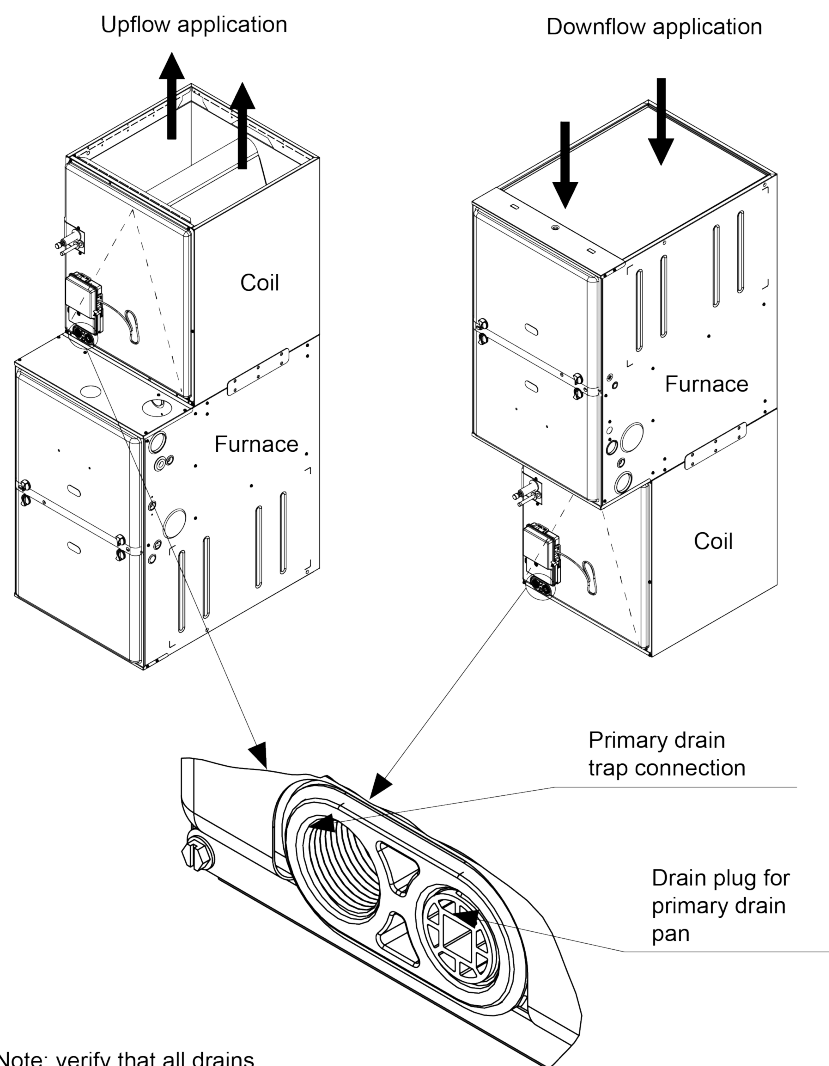


Figure 19: Location of coil trapped and plugged drain connections with furnace - CXF

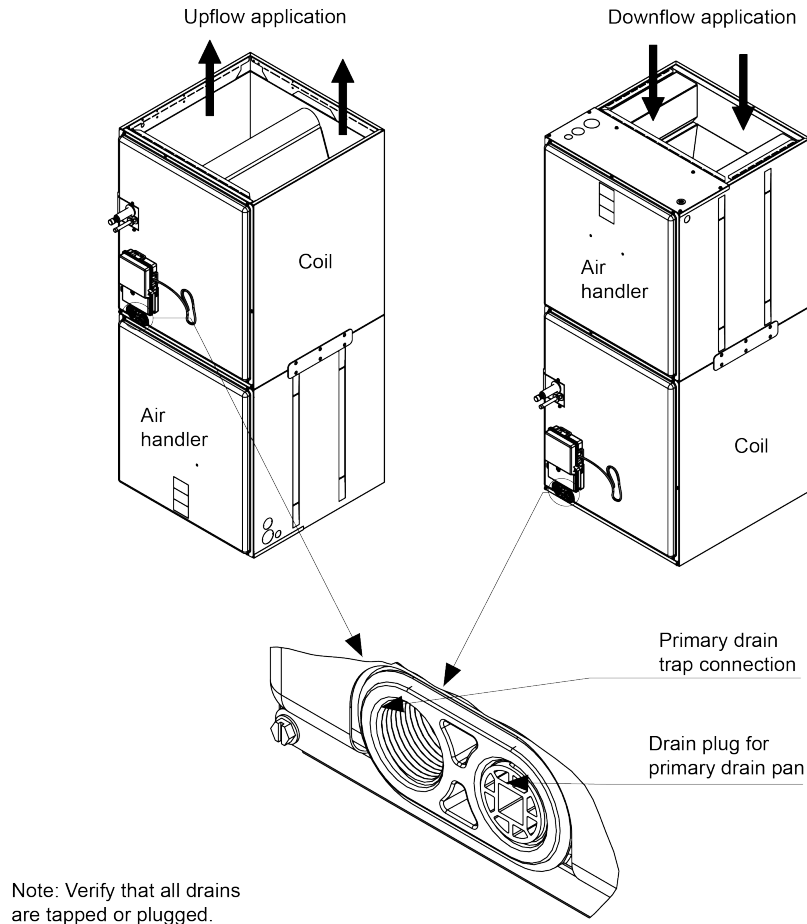


Note: verify that all drains are tapped or plugged.

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❗ **Note:** Verify that all drains are tapped or plugged.

Figure 20: Location of coil trapped and plugged drain connections with modular air handler - CXF



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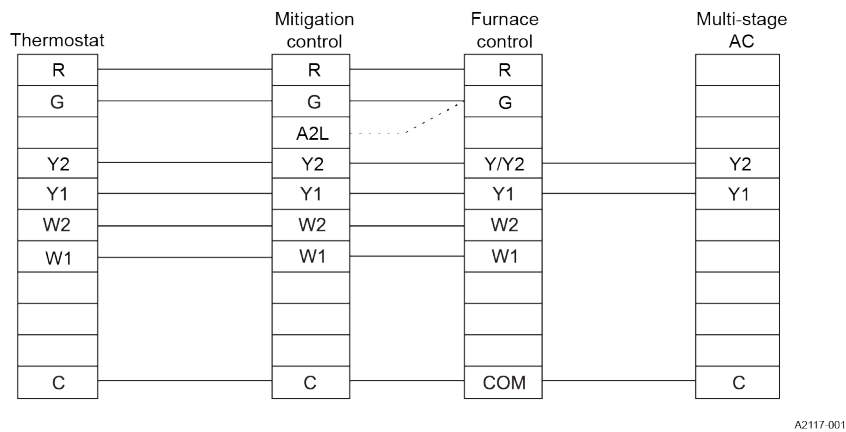
① **Note:** Verify that all drains are tapped or plugged.

Connecting the wiring

If installing a refrigerant detection system (RDS) to use this coil with R454B A2L refrigerant, refer to the RDS kit *Accessory Installation Manual* for control and sensor installation, and field wiring connections. If the coil is already equipped with a RDS, use the [Control wiring diagrams](#) for the connection of room thermostat, indoor air mover, and outdoor section.

Control wiring diagrams

Figure 21: Control wiring - standard ECM gas furnace and standard multi-stage air conditioner - conventional wiring



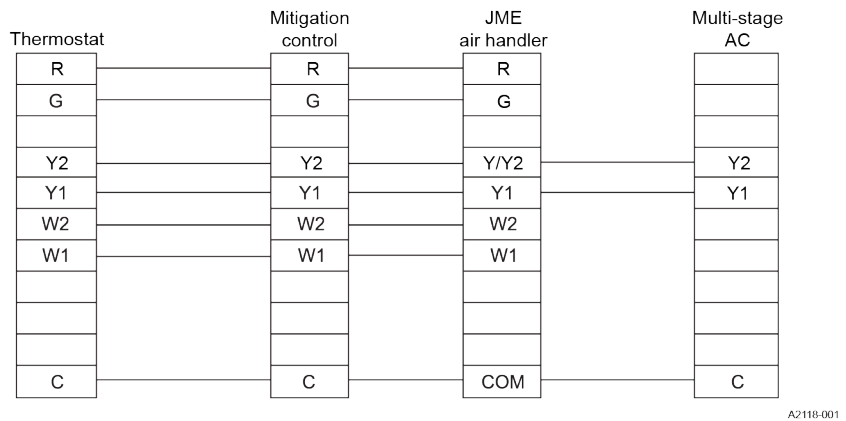
NOTICE

The mitigation control board has a bank of DIP switches. Both DIP switches must be in the 1 or on position.

W2 is applicable only on multi-stage gas furnace models.

Use the mitigation control A2L output instead of the G output for Y81E, Z8ES, RL18, Y82E, Z8ET, Y91E, Z9ES, RG19, Y92E, and Z9ET gas furnace models.

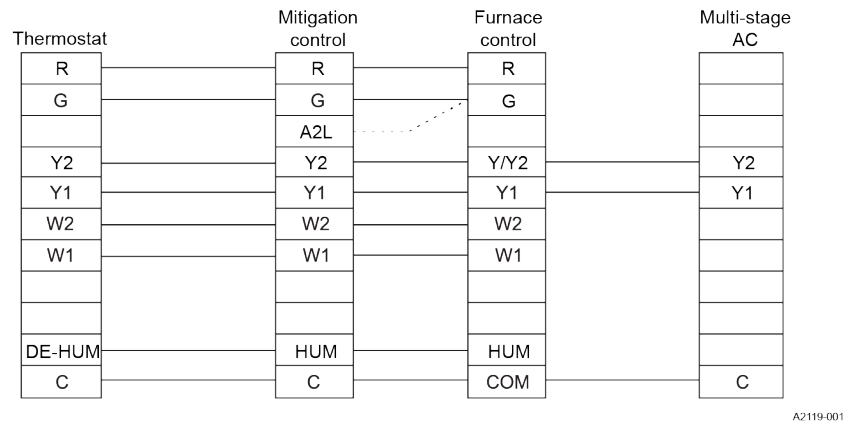
Figure 22: Control wiring - standard ECM modular air handler and standard multi-stage air conditioner - conventional wiring



NOTICE

The mitigation control board has a bank of DIP switches. For use with a JME air handler indoor model, both DIP switches must be in the 0 or off position.

Figure 23: Control wiring - variable ECM gas furnace and standard multi-stage air conditioner - conventional wiring



NOTICE

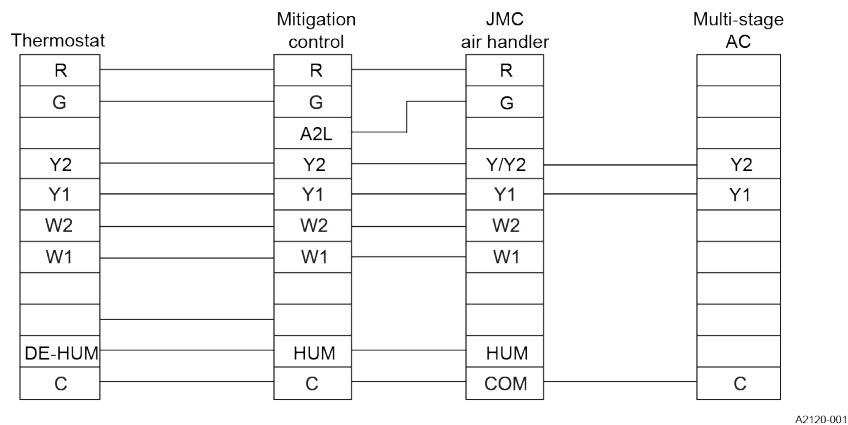
The mitigation control board has a bank of DIP switches. Both DIP switches must be in the 1 or on position.

W2 is applicable only on multi-stage gas furnace models.

Use the mitigation control A2L output instead of the G output for Y82V, Z8VT, Y92V, Z9VT, Y9VV, and Z9VV gas furnace models.

The HUM input on the furnace control is for variable speed de-humidification operation.

Figure 24: Control wiring - variable ECM modular air handler and standard multi-stage air conditioner - conventional wiring

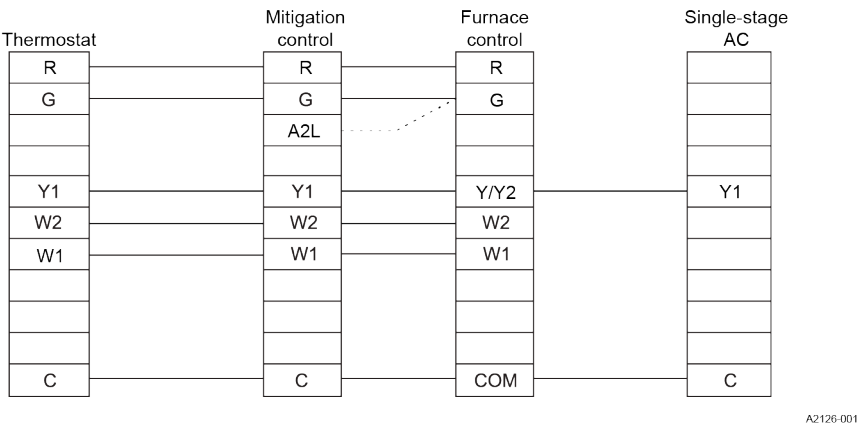


NOTICE

The mitigation control board has a bank of DIP switches. For use with a JMC air handler indoor model, both DIP switches must be in the 1 or on position.

The HUM input on the air handler control is for variable speed de-humidification operation.

Figure 25: Control wiring - standard ECM gas furnace and standard single-stage air conditioner - conventional wiring



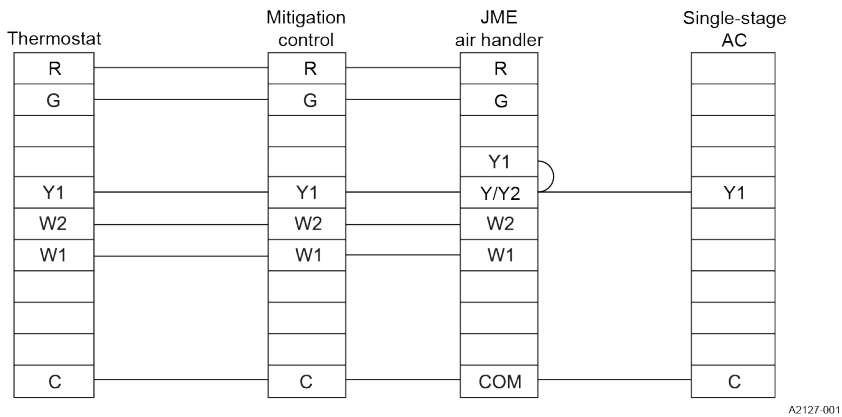
NOTICE

The mitigation control board has a bank of DIP switches. Both DIP switches must be in the 1 or on position.

W2 is applicable on only multi-stage gas furnace models.

Use the mitigation control A2L output instead of the G output for Y81E, Z8ES, RL18, Y82E, Z8ET, Y91E, Z9ES, RG19, Y92E, and Z9ET gas furnace models.

Figure 26: Control wiring - standard ECM modular air handler and standard single-stage air conditioner - conventional wiring

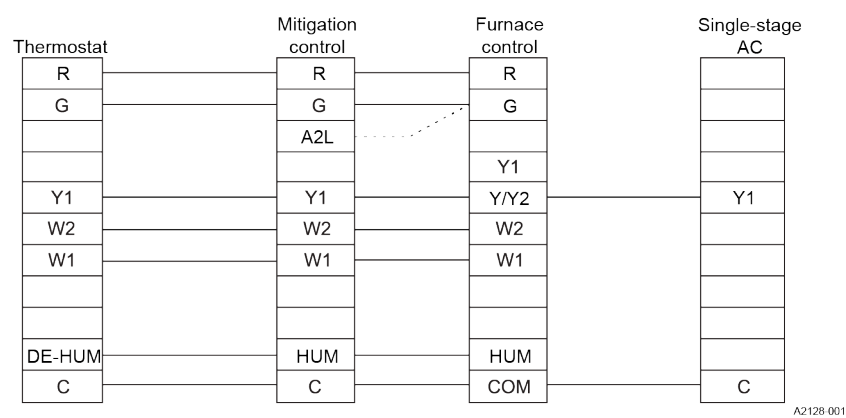


NOTICE

The mitigation control board has a bank of DIP switches. For use with a JME air handler indoor model, both DIP switches must be in the 0 or off position.

For single-stage applications, Y1 and Y/Y2 for JME air handler models must be bonded together as shown in [Figure 26](#).

Figure 27: Control wiring - variable ECM gas furnace and standard single-stage air conditioner - conventional wiring



NOTICE

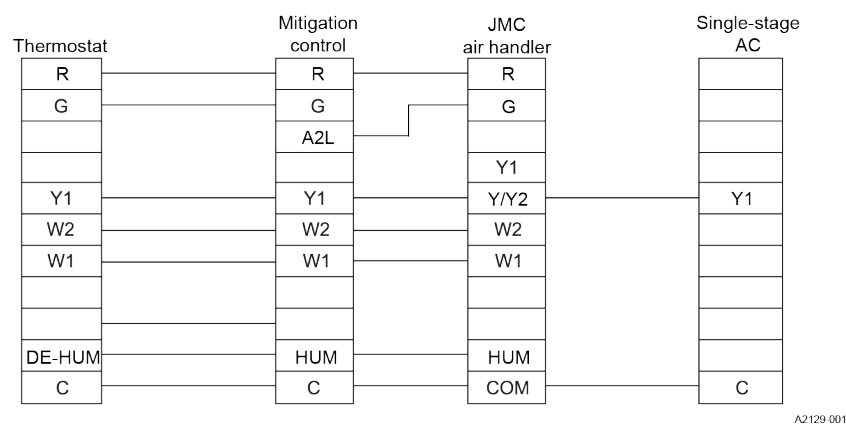
The mitigation control board has a bank of DIP switches. Both DIP switches must be in the 1 or on position.

W2 is applicable on only multi-stage gas furnace models.

Use the mitigation control A2L output instead of the G output for Y82V, Z8VT, Y92V, Z9VT, Y9VV, and Z9VV gas furnace models.

The HUM input on the furnace control is for variable speed de-humidification operation.

Figure 28: Control wiring - variable ECM modular air handler and standard single-stage air conditioner - conventional wiring



NOTICE

The mitigation control board has a bank of DIP switches. For use with a JMC air handler indoor model, both DIP switches must be in the 1 or on position.

The HUM input on the air handler control is for variable speed de-humidification operation.

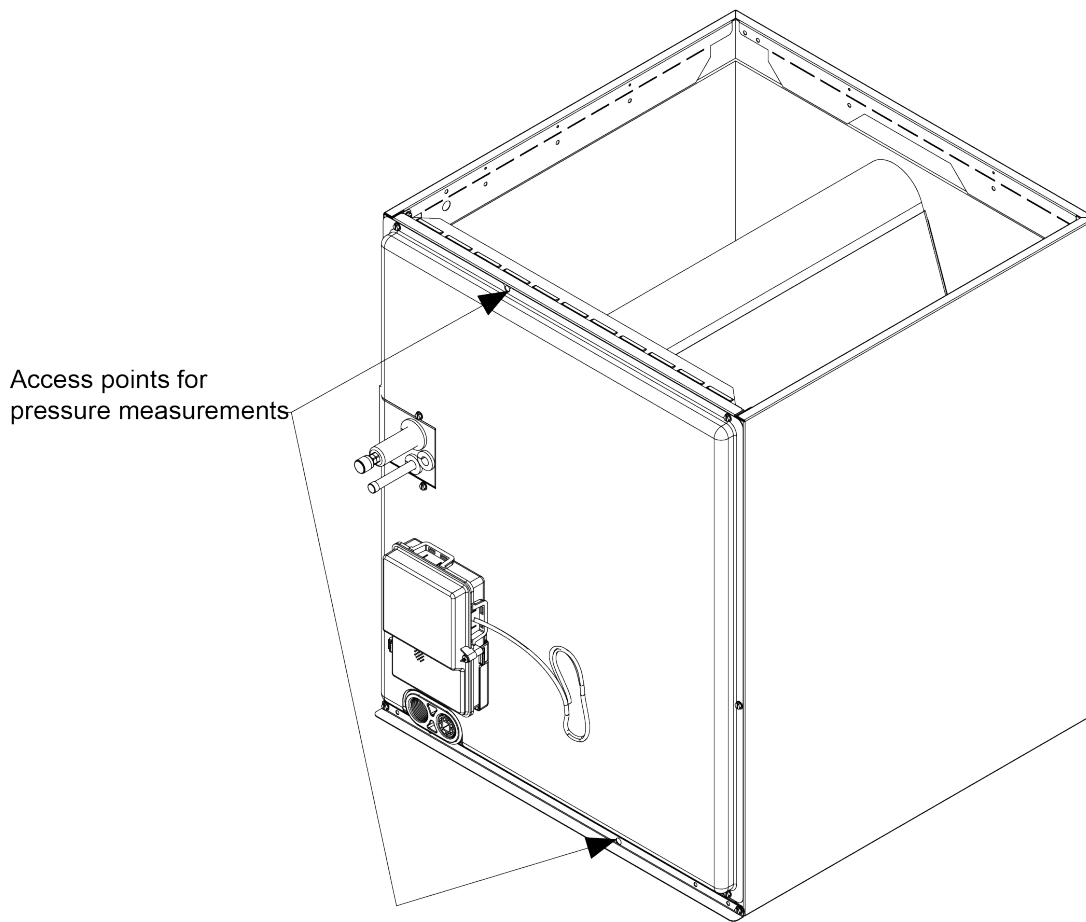
Adjusting the airflow

You must check and adjust airflow as required. Refer to the furnace or modular air handler *Installation Manual* for more information. To check the CFM, measure the static pressure drop across the coil using a portable manometer and static pressure tips. The entering and leaving air ends of the CXF coils have provisions for inserting a 1/4 in. tube for a pressure measurement using a manometer. These access points are for reference only. See [Figure 29](#).

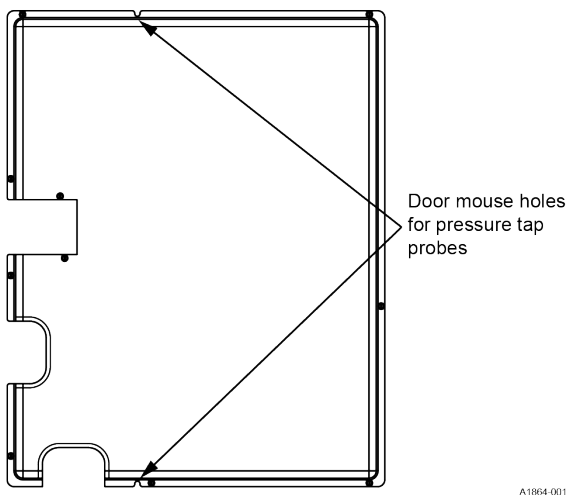
NOTICE

[Table 11](#) and [Table 12](#) have **dry coil** data. Run the system indoor fan only for approximately 15 min before taking measurements to assure a dry coil.

1. Prepare the coil for static pressure drop measurements by running the system indoor fan for approximately 15 min to ensure that the coil is dry.
2. With the indoor blower running at the appropriate speed for equipment operation, use a scratch awl to puncture or pierce the insulation material in the appropriate cabinet brace depending on the indoor coil location. Insert the static pressure tips and capture the internal coil pressure drop.
3. See the relevant coil airflow data in [Table 11](#) and [Table 12](#) to determine the airflow and make the necessary adjustments to keep the CFM within the airflow limitations of the coil.
4. After capturing airflow data and selecting the correct blower speed, seal the holes appropriately to prevent air leakage.

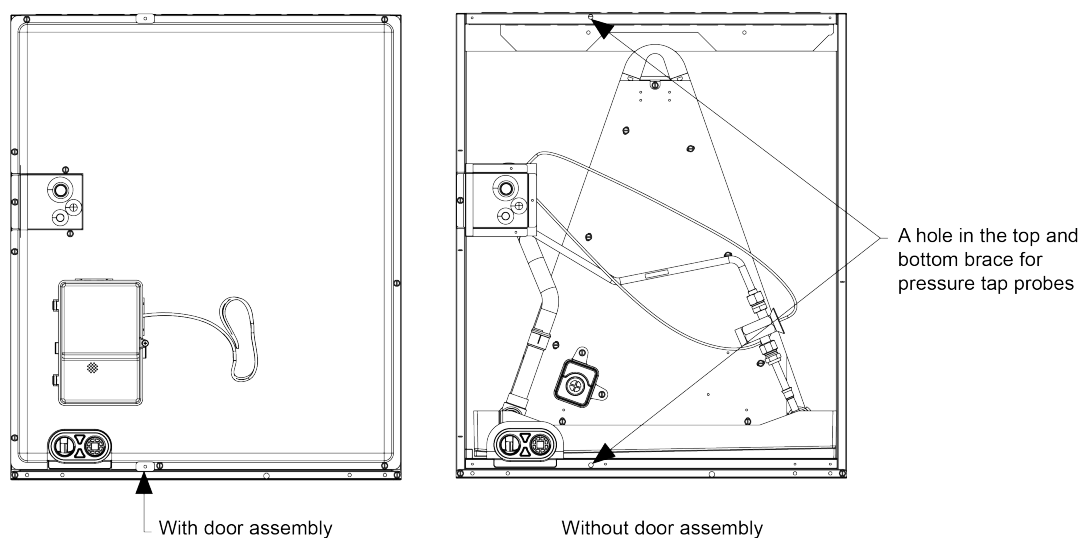
Figure 29: Pressure measurement access points

A2255-001

Figure 30: Door mouse holes

A1864-001

Figure 31: Pressure tap tips



A2256-001

Table 11: CXF airflow data (CFM)

Models	CFM								
	400	600	800	1000	1200	1400	1600	1800	2000
	External static pressure (in. W.C.)								
CXF18A5*1N1	0.05	0.10	0.16	0.24	—	—	—	—	—
CXF18B5*1N1	0.04	0.08	0.12	0.18	—	—	—	—	—
CXF24A5*2N1	0.04	0.09	0.16	0.24	0.33	—	—	—	—
CXF24B5*2N1	0.04	0.08	0.13	0.19	0.26	—	—	—	—
CXF30A5*4N1	0.05	0.10	0.17	0.25	0.34	0.45	0.58	0.72	—
CXF30B5*3N1	0.04	0.07	0.12	0.17	0.24	0.31	0.39	0.48	—
CXF30C5*3N1	0.04	0.07	0.11	0.15	0.20	0.26	0.33	0.40	—
CXF36B5*4N1	0.04	0.07	0.11	0.16	0.22	0.28	0.35	0.44	—
CXF36C5*4N1	0.02	0.05	0.08	0.12	0.16	0.20	0.26	0.31	—
CXF42C5*5S1	0.01	0.04	0.07	0.10	0.15	0.19	0.25	0.31	0.37
CXF48C5*6S1	0.02	0.05	0.08	0.11	0.15	0.20	0.25	0.31	0.38
CXF48D5*6S1	0.02	0.04	0.07	0.10	0.13	0.17	0.21	0.25	0.30
CXF60C5*7S1	0.02	0.04	0.06	0.09	0.13	0.17	0.22	0.27	0.33
CXF60D5*7S1	0.01	0.03	0.05	0.07	0.09	0.12	0.15	0.19	0.23

Note:

- Airflow data is for dry coil conditions only, tested without filters.
- For optimal performance, total system external static pressures of 0.2 in. W.C. to 0.6 in. W.C. are recommended. Applications above 0.6 in. W.C. are not recommended.

Table 12: CXF airflow data (CFM) - downflow

Models	CFM								
	400	600	800	1000	1200	1400	1600	1800	2000
	Coil pressure drop (in. W.C.)								
CXF18A5*1N1	0.06	0.11	0.19	0.29	—	—	—	—	—
CXF18B5*1N1	0.05	0.10	0.17	0.25	—	—	—	—	—
CXF24A5*2N1	0.04	0.10	0.17	0.27	0.38	—	—	—	—
CXF24B5*2N1	0.04	0.09	0.14	0.21	0.29	—	—	—	—
CXF30A5*4N1	0.06	0.11	0.19	0.29	0.41	0.55	0.72	0.90	—
CXF30B5*3N1	0.04	0.08	0.13	0.19	0.26	0.35	0.45	0.55	—
CXF30C5*3N1	0.04	0.07	0.11	0.16	0.21	0.28	0.35	0.43	—
CXF36B5*4N1	0.04	0.07	0.12	0.17	0.24	0.32	0.41	0.50	—
CXF36C5*4N1	0.02	0.05	0.09	0.13	0.19	0.25	0.31	0.39	—
CXF42C5*5S1	0.02	0.05	0.09	0.13	0.18	0.25	0.31	0.39	0.47
CXF48C5*6S1	0.03	0.05	0.09	0.13	0.18	0.24	0.30	0.38	0.46
CXF48D5*6S1	0.03	0.05	0.08	0.11	0.15	0.19	0.24	0.29	0.35
CXF60C5*7S1	0.02	0.05	0.08	0.11	0.16	0.21	0.27	0.34	0.42
CXF60D5*7S1	0.02	0.04	0.06	0.09	0.12	0.15	0.20	0.24	0.29

① Note:

- Airflow data is for dry coil conditions only, tested without filters.
- For optimal performance, total system external static pressures of 0.2 in. W.C. to 0.6 in. W.C. are recommended. Applications above 0.6 in. W.C. are not recommended.

Instructing the homeowner

When the installation is complete, do the following:

- Assist the homeowner with registering the unit warranty online at <http://www.upgproductregistration.com>, by emailing Manufacturer at cg-upgconsumerrelations@jci.com, or by calling 1-877-874-7378. It is best practice to complete a start-up sheet showing the critical readings of the unit at the time of commissioning. This start-up sheet can be uploaded as part of the online registration process.
- Instruct the homeowner that the indoor coil drain pan must be inspected and cleaned regularly to prevent odors and ensure adequate drainage.

Understanding RDS status codes and fault codes

If the coil model has a factory-installed refrigerant detection system (RDS), it is important to understand the RDS status codes and fault codes.

LED1 on the RDS mitigation control board indicates the following:

- Status codes that indicate the state of the RDS control
- Fault codes

Table 13 gives an overview of the RDS status codes and fault codes and how they display.

Table 13: RDS status codes and fault codes

LED1 display	Description	Condition	Solution
Off	No power to RDS control	No power to RDS control	<ol style="list-style-type: none"> 1. Supply power to the RDS control. 2. Check that the fuse is not open.
Red 2 s on/red 2 s off	RDS control powered and microprocessor active	No active faults, normal operation	No action needed
Red 0.5 s on/red 0.5 s off	RDS control powered and test mode active	Test mode activated by test jumper pins	No action needed
Red (solid)	RDS control failure	RDS control failure has occurred and can be detected	<ol style="list-style-type: none"> 1. Ensure the correct A2L sensor is properly plugged in the A2L terminal of the mitigation control board. 2. Ensure the A2L sensor cable is not damaged.
Emits 2 red flashes	Leak detected above 15% low flammable limit (LFL)	Sensor detects refrigerant above alarm level	<ol style="list-style-type: none"> 1. The owner is to notify service personnel as soon as possible. 2. Maintain power to the unit and try to keep the house ventilated by opening windows if possible. <p>① Note: There is potential for the A2L sensor to detect gs or propane leakage. If the service person cannot find refrigerant leakage, check on gas pipe leaks and other gas heat componenets for leakage and make any necessary repairs.</p>

Table 13: RDS status codes and fault codes

LED1 display	Description	Condition	Solution
Emits 3 red flashes	Refrigerant sensor failure	Sensor communicates failure	If this fault code occurs during normal operation, cycle the power of the unit. If the fault code remains, then replace the sensor with a new correct A2L sensor. The sensor may have this fault code if the unit is out of temperature range, humidity range, or at its end of life.
Emits 4 red flashes	Refrigerant sensor communications lost	Loss of communications with sensor	1. Ensure the correct A2L sensor is properly plugged in the A2L terminal of the mitigation control board. 2. Ensure the A2L sensor cable is not damaged.

Displaying and clearing stored fault codes

The RDS control stores fault codes for 30 days. You can use the push button on the RDS mitigation control board to retrieve and clear stored fault codes if no active faults are present.

► Important:

- If you press and hold the push button for less than 2 s, the RDS control does not respond.
- If an active fault is present when you press and hold the push button, the RDS control does not respond.

To display and clear stored fault codes, do the following:

1. On the RDS mitigation control board, press and hold the push button for 2 s to 5 s. If stored fault codes are present, the fault codes display.
2. Press and hold the push button for more than 5 s to clear the stored fault codes if required.

Maintaining the unit

CAUTION

Ensure adequate precautions are taken to protect electrical components and structure from liquid.

If cleaning the coil as part of a future maintenance or servicing schedule, clean the coil with water or use Evap-Green by Nu-Calgon as an alternative to water. Evap-Green is the only pH neutral coil cleaner approved for use when correctly diluted.

 **Note:** Rinse coils thoroughly after using Evap-Green for cleaning.

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