

INSTALLATION INSTRUCTIONS

TXV Coils for Manufactured Housing

EMA


NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory–authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warning or cautions included in literature and attached to the unit. Consult local building codes and the current editions of the National Electrical Code (NEC) NFPA 70.

In Canada, refer to the current editions of the Canadian Electrical Code CSA C22.1.

Recognize safety information. When you see this symbol  on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE**. These words are used with the safety–alert symbol. **DANGER** identifies the most serious hazards which **will** result in severe personal injury or death. **WARNING** signifies hazards which **could** result in personal injury or death. **CAUTION** is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. **NOTE** is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

These instructions must be read and understood completely before attempting installation.

It is important that the Blower and Duct System be properly sized to allow the system to operate at full capacity. Poorly designed systems will not give satisfactory cooling or economy. They may even shorten the service life of the compressor in the outdoor unit.

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WARNING

ELECTRICAL SHOCK HAZARD

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

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Tag disconnect switch with a suitable warning label. Turn off accessory heater power if applicable.

CAUTION

UNIT OR PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in product or property damage.

This coil contains Nitrogen precharge of 15 PSI. Release of this pressure through the center of the rubber plugs is required before removing the plugs.

CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

INSTALLATION

EMA coils are designed to be used within a gas or electric downflow furnace certified for use in manufactured homes (mobile homes). EMA coils are suitable for use in upflow cooling configurations with upflow electric furnaces, but *are not* qualified for use with traditional upflow gas and oil furnaces (nuisance tripping of heat exchangers limits may result).

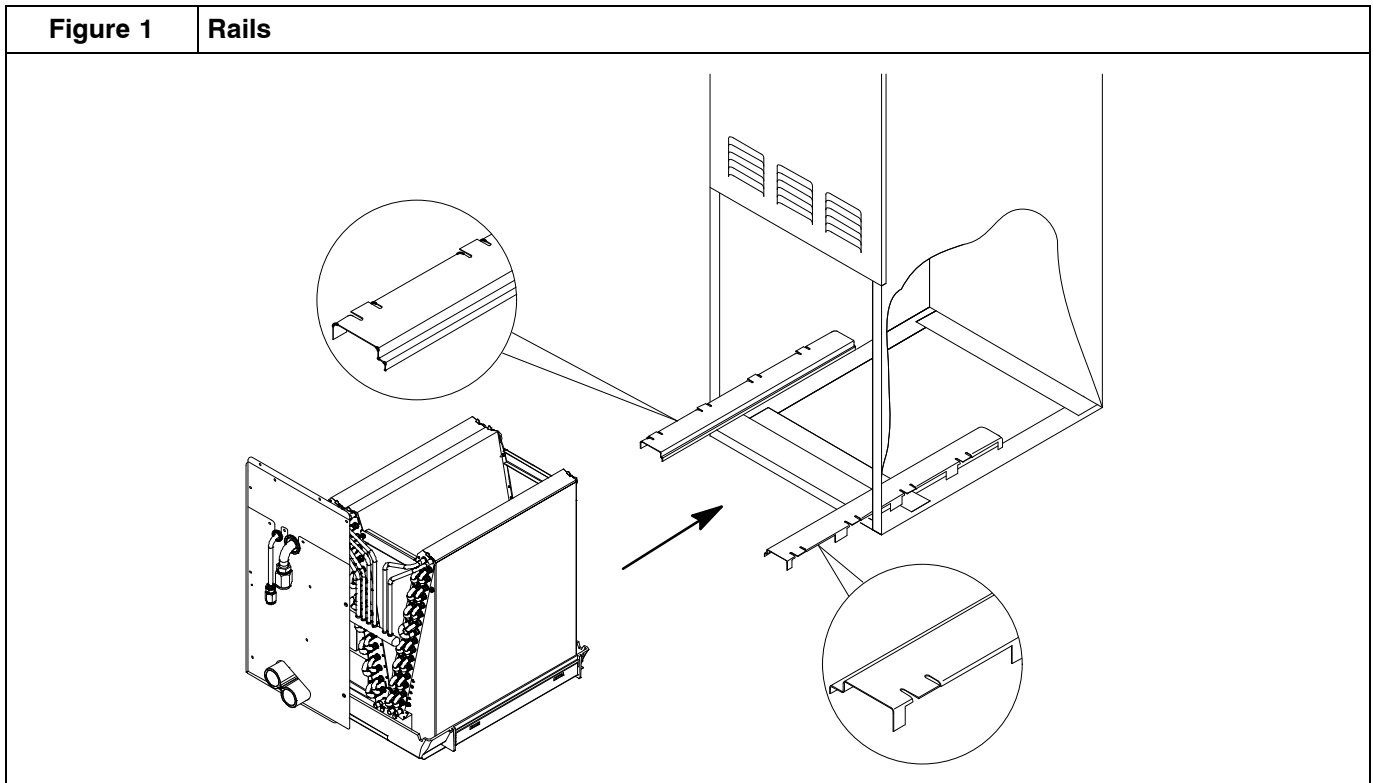
EMA Coils are for use on the outlet (supply) side of gas or oil furnaces only. This reduces condensate formation in the furnace heat exchanger during the cooling cycle.

When an EMA Coil is used in a Heat Pump application combined with a gas or oil furnace, a Fossil Fuel Kit must be used. Refer to Product Specification Literature for kit part number.

1. Disconnect power to furnace.
2. Remove furnace front access door(s).
3. Remove furnace inner sheet metal shield.
4. Remove knockouts from furnace cabinet and inner shield.
5. Assemble the two halves of the coil header plate over the coil tubes and fasten together using supplied screws

6. Slide rubber grommets into place around coil tubes and into coil header plate holes.
7. Position rails inside furnace as shown in **Figure 1**. Slide coil into furnace, nesting drain pan inside rails.
8. Align furnace inner shield (removed earlier) with coil header plate so that the refrigerant tubes fit through the knockouts. Fasten each corner of shield to header plates using supplied screws.

NOTE: Some furnaces require that the flange at the top of the upper coil header plate be removed or bent down flat in order to fit the furnace inner shield.



⚠ CAUTION

PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in property damage

A field fabricated auxiliary drain pan, with a separate drain is **REQUIRED** for all installations over a finished living space or in any area that may be damaged by overflow from a restricted main drain pan.

manner that will not obstruct service access to the unit or removal of the filter.

⚠ WARNING

PERSONAL INJURY HAZARD

Failure to relieve pressure in the coil could result in personal injury.

Wear eye protection. Coil is factory charged with 15 psi nitrogen. Pierce the centers of both rubber tubing plugs to relieve pressure before removing plugs.

REFRIGERANT LINE CONNECTIONS

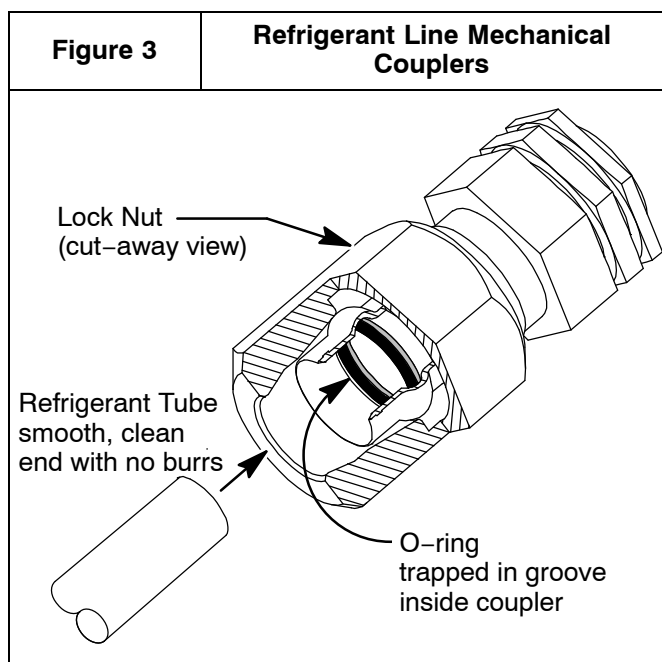
NOTE: Factory nitrogen charge may escape past rubber plugs during storage. This does not indicate a leaking coil nor warrant return of the coil.

Size and install refrigerant lines according to information provided with outdoor unit. Coil connection tube sizes are shown in **Figure 2**. Route refrigerant lines to the coil in a

Figure 2 Model Size	Coil Connection Tube Size (inch)	
	Liquid	Suction
24 (2 ton)	3/8	5/8
36 (3 ton)	3/8	3/4
48 (4 ton)	3/8	3/4

Coil is provided with mechanical couplers for connecting the refrigerant tubes. Refer to **Figure 3** and follow these steps:

1. Loosen lock nut on coupler 1 turn. Do not remove lock nut.
2. Remove plug and check that O-ring is in place in the groove inside the coupler.
3. Cut refrigerant tubing to length and clean-up the end square, smooth, and round.
NOTE: Burrs on tube end will cut and ruin the O-ring.
NOTE: See outdoor unit Installation Instructions regarding requirements for installation of a filter-drier in the liquid line close to the indoor coil.
4. Slide the refrigerant tube into the the coupler until it bottoms out.
5. Hold the body of the coupler with one wrench and tighten the lock nut with another wrench. Tighten until the lock nut contacts the coupler hex flange.



REFRIGERANT METERING DEVICE

EMA4X coils have a factory installed hard shut-off TXV designed only for use with R-410A refrigerant. Use only with outdoor units designed for R-410A.

TXV is factory set and not field adjustable.

Carefully remove TXV bulb insulation and verify that the TXV bulb is securely fastened with hose clamp. Tighten screw a half-turn past hand tight with TXV bulb placed in the indentation with full contact with the vapor line tube. Re-wrap TXV bulb with insulation.



CAUTION

PRODUCT DAMAGE HAZARD

Failure to follow this caution may result in product damage.

This coil has a hard shut-off TXV metering device. A compressor Hard Start Kit is required in all applications where the matching outdoor unit has a single-phase reciprocating compressor.

CONDENSATE DRAIN

Coil is provided with two 3/4" NPT condensate drain connections. The **lower connection is the primary drain**, and the **higher connection is the secondary (overflow) drain**.

Coil is provided with flexible drain tubing, 90° combination fitting, and P-trap (refer to Figure 4).

1. Thread the 90° combination fitting into the primary (lower) drain. Use pipe dope and do not over tighten.
2. Determine where the P-trap will be placed.
NOTE: Keep the P-trap as close to the coil as possible. P-trap must be positioned lower than the bottom of the drain pan. Refer to Figure 4.
3. Cut a length of the flexible tubing and install it from the 90° combination fitting to the P-trap.
4. Install the remainder of the flexible tubing to the outlet side of the P-trap and route the tubing to the outside. Check local codes before connecting to a waste (sewer) line.
NOTE: Route hose so that it does not obstruct access to the filter.
5. **Prime the trap**, test for leaks, and insulate drain lines where sweating could cause water damage.
6. If a gravity drain cannot be used, install a condensate pump. Install the pump as close to the indoor section as possible.

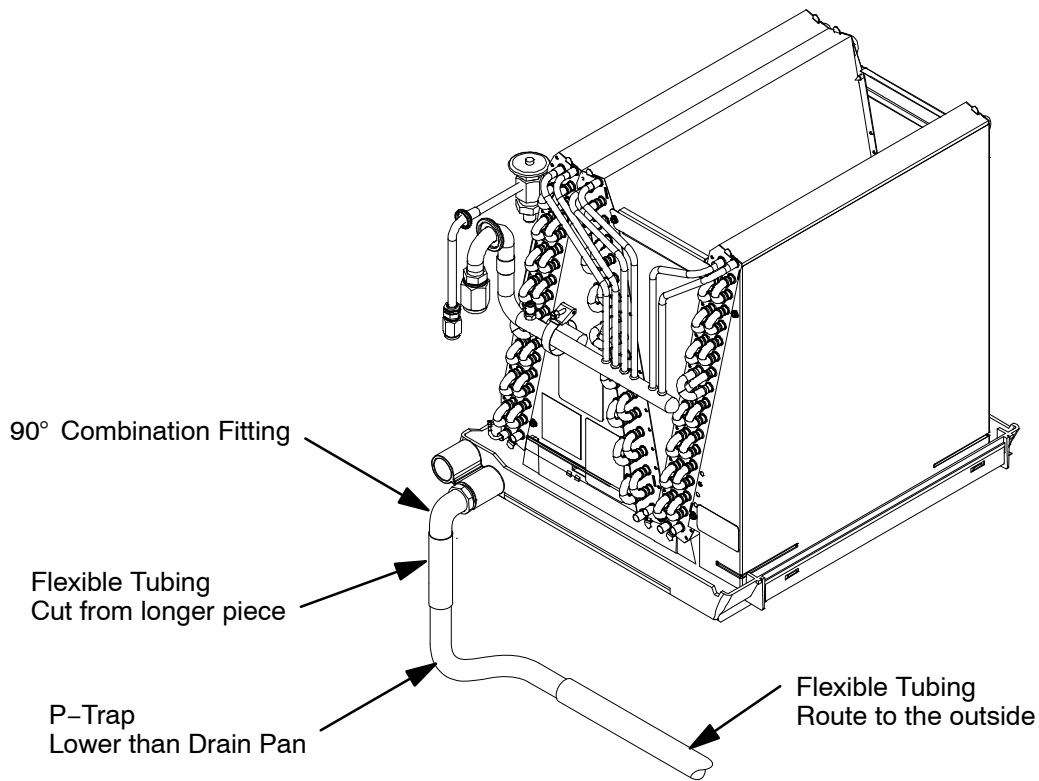
If coil is located in or above a living space where damage may result from condensate overflow, a separate 3/4" drain must be provided from secondary (overflow) drain connection. Run this drain to a place in compliance with local installation codes where it will be noticed when unit is operational. Condensate flowing from secondary (overflow) drain indicates a plugged primary drain – unit requires service or water damage will occur.

NOTE: For downflow electric furnace, the secondary (overflow) drain connection must be installed to prevent possibility of water dripping onto live electrical components.

If secondary drain is required, fabricate a similar hose and P-trap and install to the secondary (higher) drain pan connection.

Figure 4

Condensate Drain

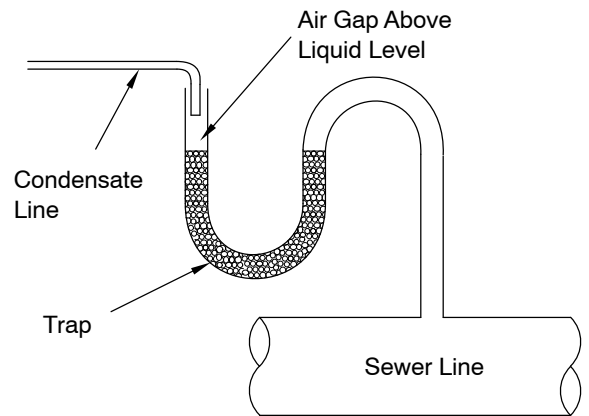


WASTE LINE CONNECTION

If the condensate line is to be connected to a waste (sewer) line, an open trap must be installed ahead of the waste line to prevent escape of sewer gases (see Figure 5).

Figure 5

Condensate Drain to Waste Line



⚠ WARNING

EXPLOSION HAZARD

Failure to provide trap could result in personal injury, death, or property damage.

Provide trap with air gap in drain line when connecting to waste (sewer) line. See Figure 5.

⚠ CAUTION

UNIT OR PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in property damage.

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.

CHECK AND ADJUST AIR FLOW

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Failure to shut of electric power could result in personal injury or death.

Before adjusting blower speed, shut off electric power to the furnace or blower module.

It is important that the correct amount of air (CFM) flows through the coil. The installer must determine the required CFM based on the characteristics of the specific system (such as system size, ducting, components, and accessories). In general, 400 CFM per ton is the nominal required value, with a range of 350 – 450 CFM per ton.

Check Static Pressure Drop and CFM Across Coil

The amount of air (CFM) is related to a pressure drop. To determine the CFM, measure the pressure drop using an inclined manometer (sometimes called draft gauge or air flow gauge).

1. The coil should be dry and clean. The air filter must be clean and in place. All registers open. DO NOT run the outdoor unit when checking air flow.
2. Run the blower on cooling speed.
3. Using the manometer (draft gauge or flow gauge), measure the static pressure drop across the dry coil and compare it to the numbers in Figure 6.
4. Find the corresponding CFM in Figure 6.

Adjusting Air Flow

If CFM is too low, increase the blower speed and measure the static pressure drop again. Determine CFM from Figure 6.

If CFM is too high, reduce the blower speed and measure the static pressure drop again. Determine CFM from Figure 6.

NOTE: Change blower speed as shown in the instructions for the furnace or air handler.

NOTE: It may not be possible to obtain a gauge reading exactly the same as shown in Figure 6. This is due to variations in duct systems and blower speeds.

If the motor is at the highest speed and the CFM is still not high enough, replace the blower and/or motor with a larger size.

If the unit has an adjustable belt driven blower, use an ammeter to check the motor current draw. If the current draw is higher than the motor name plate amps, replace the motor with one of greater horsepower.

Figure 6		CFM and Pressure Drop	
Coil Size	CFM Across Coil	Static Pressure Drop Across Coil (Inches Water Column)	
		Dry	Wet
24 2 tons	700	0.182	0.214
	800	0.233	0.269
	900	0.290	0.336
36 3 tons	1000	0.189	0.236
	1100	0.221	0.276
	1200	0.259	0.315
	1300	0.299	0.361
	1400	0.341	0.413
48 4 tons	1400	0.322	0.348
	1500	0.366	0.396
	1600	0.413	0.446
	1700	*	*
	1800	*	*

* Excessive pressure drop, application not recommended.

START-UP PROCEDURE

Refer to outdoor unit Installation Instructions for refrigeration system start-up instructions and refrigerant charging method details.

R-410A QUICK REFERENCE GUIDE

- R-410A refrigerant operates at 50% – 70% higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with R-410A.
- R-410A refrigerant cylinders are rose colored.
- Recovery cylinder service pressure rating must be 400 psig, DOT 4BA400 or DOT BW400.
- R-410A systems should be charged with liquid refrigerant. Use a commercial type metering device in the manifold hose.
- Manifold sets should be 750 psig high-side and 200 psig low-side with 520 psig low-side retard.
- Use hoses with 750 psig service pressure rating.
- Leak detectors should be designed to detect HFC refrigerant.
- R-410A, as with other HFC refrigerants, is only compatible with POE oils.
- POE oils absorb moisture rapidly. Do not expose oil to atmosphere.
- POE oils may cause damage to certain plastics and roofing materials.
- Vacuum pumps will not remove moisture from oil.
- A liquid line filter-drier is required on every unit.
- Do not use liquid line filter-driers with rated working pressures less than 600 psig.
- Do not install a suction line filter-drier in liquid line.
- Wrap all filter-driers and service valves with wet cloth when brazing.
- Do not use with an R-22 TXV.
- If indoor unit is equipped with an R-22 TXV, it must be changed to an R-410A TXV.
- Do not use capillary tube indoor coils.
- Never open system to atmosphere while it is under a vacuum.
- When system must be opened for service, break vacuum with dry nitrogen and replace all filter-driers.
- Do not vent R-410A into the atmosphere.
- Observe all **WARNINGS**, **CAUTIONS**, **NOTES**, and **bold** text.