

INSTALLATION INSTRUCTIONS

TXV Horizontal Duct Coils

EHD

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.

Safety Labeling and Signal Words

DANGER, WARNING, CAUTION, and NOTE

The signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE** are used to identify levels of hazard and seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING**, **CAUTION**, and **NOTE** will be used on product labels and throughout this manual and other manuals that may apply to the product.

DANGER – Immediate hazards which **will** result in severe personal injury or death.

WARNING – Hazards or unsafe practices which **could** result in severe personal injury or death.

CAUTION – Hazards or unsafe practices which **may** result in minor personal injury or product or property damage.

NOTE – Used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:



WARNING

The signal word **CAUTION** is used throughout this manual in the following manner:



CAUTION

Signal Words on Product Labeling

Signal words are used in combination with colors and/or pictures on product labels.

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WARNING

ELECTRICAL SHOCK HAZARD

Failure to turn off electric power could result in personal injury or death.

Before installing or servicing system, turn off main power to the system. There may be more than one disconnect switch, including accessory heater(s).

INSTALLATION

EHD Coils are designed to be used for air conditioning or heat pump operation within horizontal runs of HVAC ductwork. The ductwork may be a new or existing system, associated with a furnace, air handler, blower cabinet, or other air moving device.

NOTE: For cooling applications, air can flow in either direction through the coil. For heat pump applications, the air should flow in the direction of the arrow shown on the coil casing (refer to Figure 3). Heating performance will be reduced if air flows opposite of the arrow. (No affect to cooling performance.)

Verify that the ductwork is suitable for cooling operation. Externally insulated ductwork must have an adequate vapor barrier. The vapor barrier prevents condensation from forming in the insulating material, which would result in loss of insulating value and deterioration of the insulation material.

NOTE for Heat Pump with Electric Heat: When coil is used in a Heat Pump application with electric heat, coil must be installed upstream of the electric heater (refer to Figure 1). This prevents electric heat from driving up refrigeration system pressure during heating cycle.

NOTE for Gas or Oil Furnace: When coil is used in an Air Conditioning or Heat Pump application combined with a gas or oil furnace, coil must be installed downstream of the furnace heat exchanger (refer to Figure 1). This reduces condensate formation in the furnace heat exchanger during the cooling cycle.

NOTE for Heat Pump with Gas or Oil Furnace: When coil is used in a Heat Pump application combined with a gas or oil furnace, a Fossil Fuel Kit must be used. This coordinates heat properly between furnace and heat pump. Refer to Product Specification Literature for kit part number.

1. If the connecting ductwork is larger or smaller than the coil casing openings, fabricate transition pieces.
NOTE: Make the transition pieces long enough so that the angle from horizontal is 30° or less (refer to Figure 1).
2. Provide at least 3 feet of straight duct immediately before the inlet to the coil (refer to Figure 1).
3. Position coil so that it slopes slightly ($\frac{1}{8}$ ") towards the condensate drain openings.
4. Support coil either with braces from underneath, or with hangers from above. Position fasteners (screws) so that they will not contact the coil tubing.

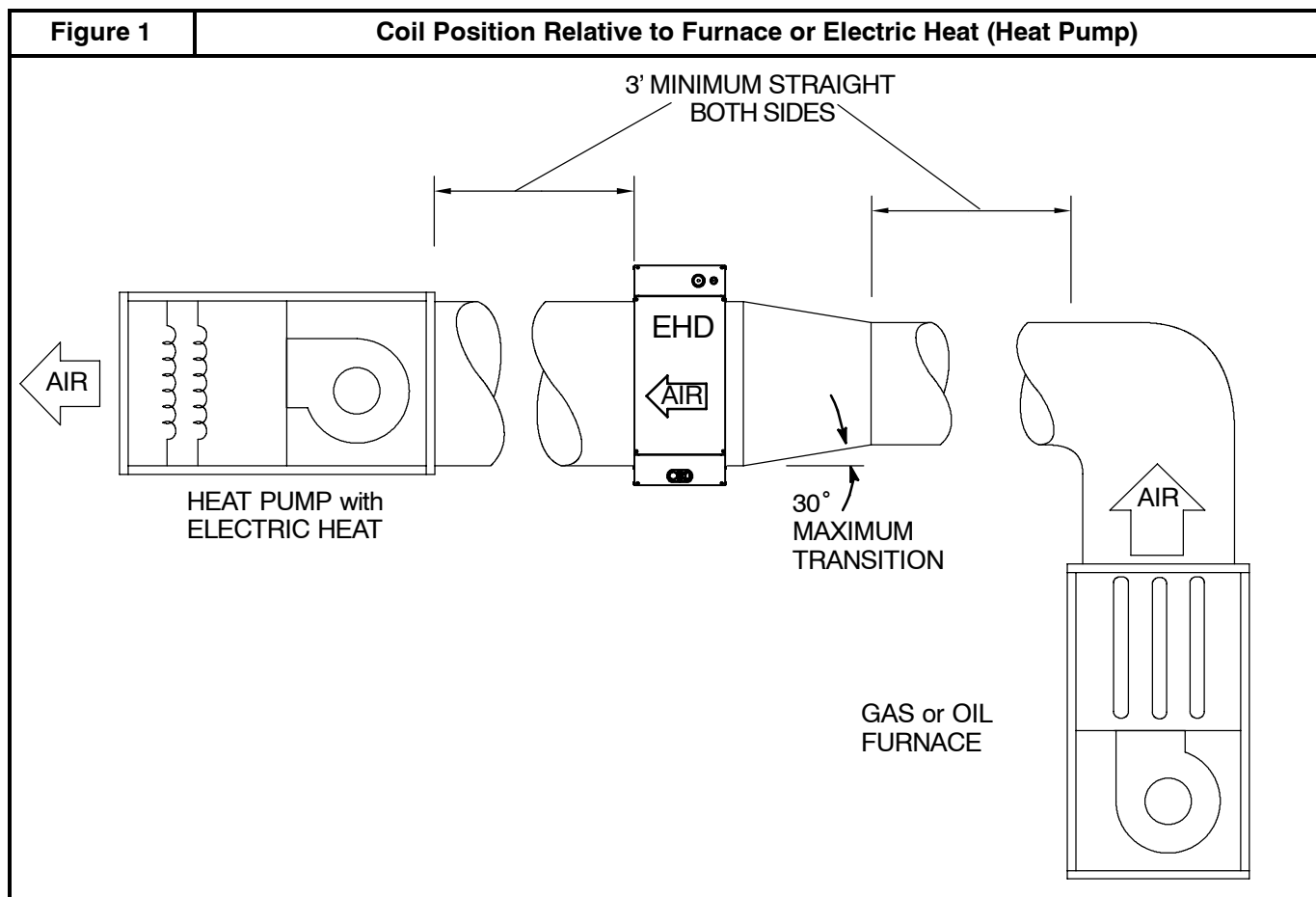


CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in unit damage

When securing braces or supports to unit, select a location where drill and fasteners will not contact refrigeration components.





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.

REFRIGERANT LINE CONNECTIONS



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.

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

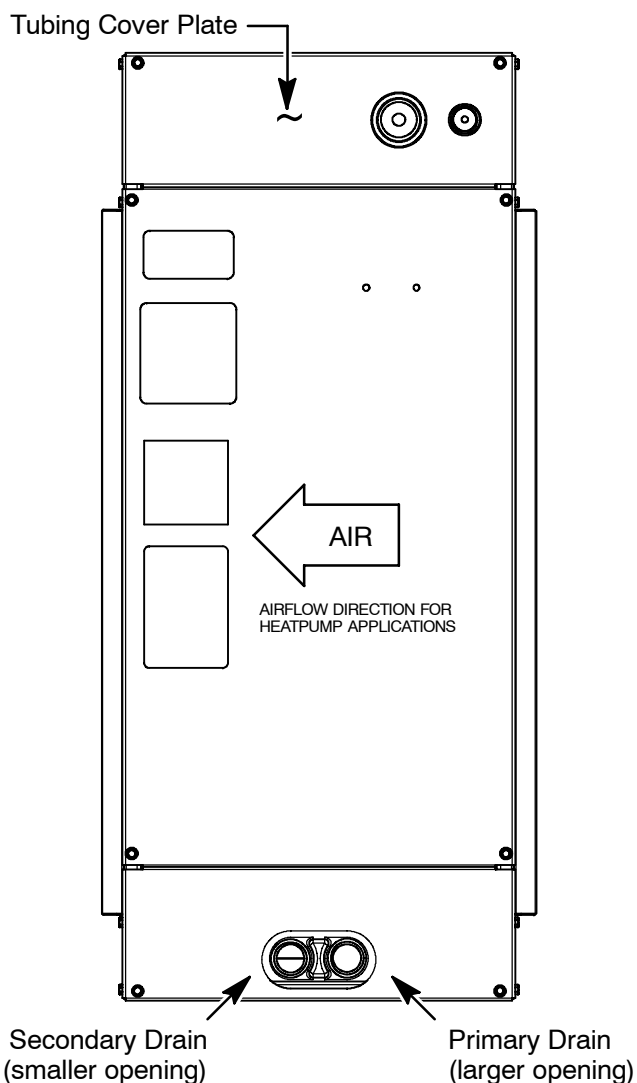
Size and install refrigerant lines according to information provided with outdoor unit. Coil connection tube sizes are shown in Figure 2. Route refrigerant lines to the coil in a manner that will not obstruct service access to the unit.

1. Slide tubing cover plate onto the refrigerant lines (field line-set), away from braze joints.
2. Remove rubber plugs from coil stubs using a pulling and twisting motion. Hold coil stubs steady to avoid bending or distorting.
3. Wrap TXV and nearby tubing with a heat-sinking material such as a wet cloth.
4. Fit refrigerant lines into coil stubs. Wrap a heat sinking material such as a wet cloth behind braze joints.
NOTE: See outdoor unit Installation Instructions regarding requirements for installation of a filter-drier in the liquid line close to the indoor coil.
5. Braze using a Sil-Fos or Phos-copper alloy.
6. After brazing, allow joints to cool. Slide tubing cover plate over joints.

Figure 2	Coil Connection Tube Size (inch)	
Model Size	Liquid	Suction
24 (2 ton)	$\frac{3}{8}$	$\frac{5}{8}$
30 (2½ ton)	$\frac{3}{8}$	$\frac{3}{4}$
36 (3 ton)	$\frac{3}{8}$	$\frac{3}{4}$
42 (3½ ton)	$\frac{3}{8}$	$\frac{7}{8}$
48 (4 ton)	$\frac{3}{8}$	$\frac{7}{8}$
60 (5 ton)	$\frac{3}{8}$	$\frac{7}{8}$

Figure 3

EHD Coil (end view)



REFRIGERANT METERING DEVICE

EHD2X coils have a factory installed hard shut-off TXV designed only for use with R-22 refrigerant. Use only with outdoor units designed for R-22.

EHD4X 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.

CONDENSATE DRAIN

Coil is provided with two $\frac{3}{4}$ " NPT condensate drain connections. The connection with the **larger internal opening is the primary drain**, and the connection with the **smaller internal opening is the secondary (overflow) drain** (refer to Figure 3). Use PVC fittings on the plastic condensate pan. Finger tighten plus $1\frac{1}{2}$ turns. Do not over-tighten. Use pipe dope.

If coil is located in or above a living space where damage may result from condensate overflow, a separate $\frac{3}{4}$ " 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.

1. Connect drain lines to the appropriate drain connections. Drain lines should not be smaller than the drain connections ($\frac{3}{4}$ ").
2. **NOTE:** Traps must be used when the coil is installed on the return air side of the system (negative pressure). When coil is installed on the supply side (positive pressure) it is not necessary to install traps and better drainage is usually achieved without traps.

Install properly sized condensate traps in the drain line as close to the coil as possible. Install drain lines below the bottom of the drain pan and pitch the drain lines down from the coil at least $\frac{1}{4}$ inch per foot of run. Horizontal runs over 15 feet long must also

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 (refer to Figure 5).

! 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. Refer to Figure 5.

! CAUTION

PRODUCT DAMAGE HAZARD

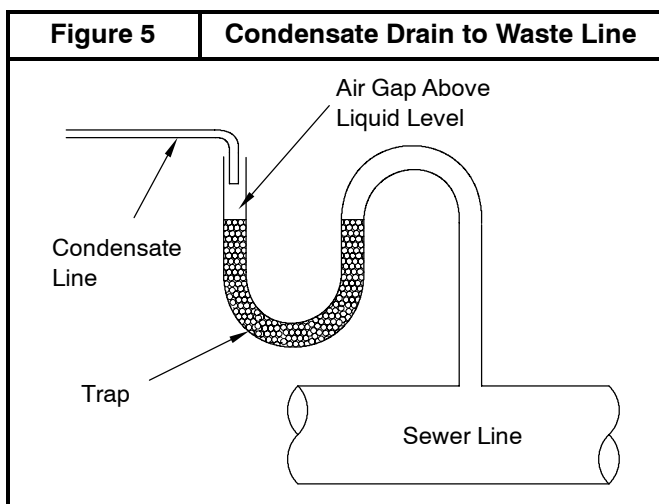
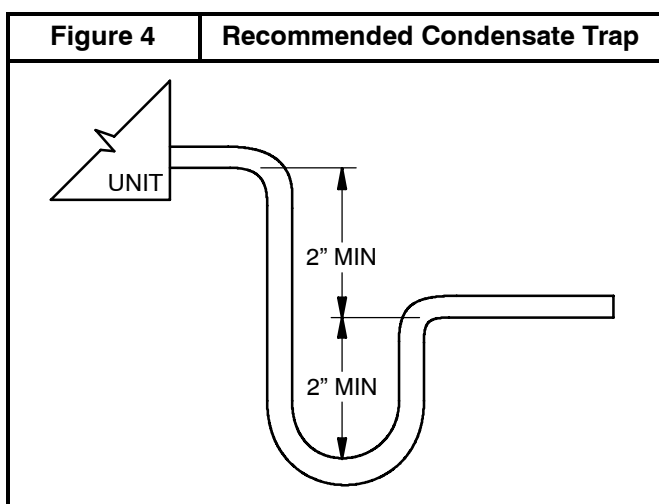
Failure to follow this caution may result in product damage.

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.

have an anti-siphon air vent (stand pipe), installed ahead of the horizontal run. An extremely long horizontal run may require an oversized drain line to eliminate air trapping.

Refer to Figure 4 for minimum trap dimensions.

3. Route to the outside or to a floor drain. Check local codes before connecting to a waste (sewer) line.
4. **Prime all traps**, test for leaks, and insulate drain lines where sweating could cause water damage.
5. If a gravity drain cannot be used, install a condensate pump. Install the pump as close to the indoor section as possible.



CHECK AND ADJUST AIR FLOW



WARNING

ELECTRICAL SHOCK HAZARD

Failure to shut off 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.

START-UP PROCEDURE

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

Figure 6		CFM and Pressure Drop					
Coil Size	CFM Across Coil	Static Pressure Drop Across Coil (Inches Water Column)		Coil Size	CFM Across Coil	Static Pressure Drop Across Coil (Inches Water Column)	
		Dry	Wet			Dry	Wet
24 2 tons	400	0.060	0.069	48 4 tons	600	0.063	0.080
	500	0.081	0.096		700	0.076	0.101
	600	0.104	0.129		800	0.091	0.123
	700	0.129	0.162		900	0.105	0.149
	800	0.155	0.198		1000	0.121	0.175
	900	0.186	0.237		1100	0.138	0.206
	1000	0.217	0.278		1200	0.157	0.215
					1300	0.175	0.231
30 2½ tons	400	0.044	0.050		1400	0.195	0.261
	500	0.060	0.071		1500	0.217	0.291
	600	0.077	0.093		1600	0.238	0.325
	700	0.097	0.116		1700	0.260	0.361
	800	0.116	0.144		1800	0.284	0.394
	900	0.140	0.172	60 5 tons	800	0.051	0.063
	1000	0.165	0.203		900	0.060	0.076
	1100	0.190	0.235		1000	0.069	0.089
	1200	0.219	0.269		1100	0.079	0.102
36 3 tons	400	0.043	0.048		1200	0.090	0.118
	500	0.058	0.066		1300	0.101	0.135
	600	0.074	0.086		1400	0.113	0.155
	700	0.089	0.104		1500	0.125	0.175
	800	0.107	0.128		1600	0.138	0.193
	900	0.127	0.154		1700	0.153	0.214
	1000	0.150	0.182		1800	0.165	0.235
	1100	0.172	0.212		1900	0.180	0.258
	1200	0.197	0.245		2000	0.195	0.279
	1300	0.224	0.280				
	1400	0.252	0.317				
42 3½ tons	600	0.065	0.076				
	700	0.079	0.094				
	800	0.095	0.114				
	900	0.113	0.137				
	1000	0.134	0.163				
	1100	0.154	0.189				
	1200	0.176	0.215				
	1300	0.197	0.245				
	1400	0.220	0.273				
	1500	0.246	0.303				
	1600	0.268	0.332				

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.