

# Installation Instructions

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

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## 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 cloths for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and the current editions of the National Electrical Codes (NEC) NFPA 70.

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

Recognize safety information. This is the safety-alert symbol . 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** and **CAUTION**. 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.

### **WARNING**

#### **ELECTRICAL SHOCK HAZARD**

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

Before installing, modifying or servicing system, always turn off main power to system. There may be more than one disconnect switch. Lock out and tag switch with a suitable warning label.

### **CAUTION**

#### **CUT HAZARD**

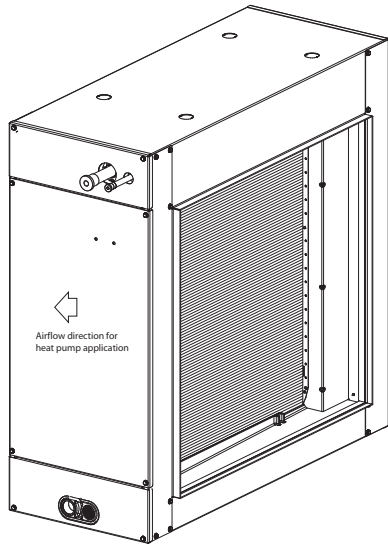
Failure to follow this caution may result in personal injury.

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

**IMPORTANT:** Nitrogen can leak out through the plug. This does not indicate a leaking coil nor warrant return of coil.

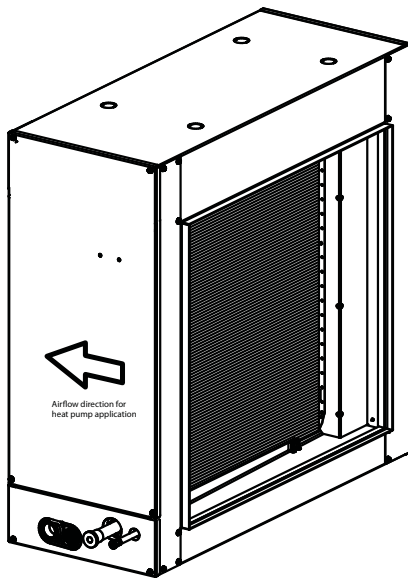
## INTRODUCTION

Use these instructions to install Model CSPHP duct coils in horizontal position. (See Fig. 1.) It is easily adaptable to most types of existing forced-air heating systems, or can be installed in an independent air-cooling system.



Tin

A06520



Aluminum

A10475

Fig. 1 - CSPHP Coil

## INSTALLATION

### Step 1 — Check Existing Ductwork

Inspect the previously installed air distribution system for heating to determine its suitability for cooling. Existing heating ductwork may have to be modified and insulated to provide better air distribution for cooling.

### Step 2 — Insulate and Vapor-proof Duct

Externally insulated ductwork must have an adequate vapor seal for summer operation. This is particularly important where the duct is exposed to high humidity conditions in attics, vented crawl spaces, unconditioned basements and utility rooms. The vapor seal prevents condensation in the insulating material and subsequent loss of insulating value. Properly installed heating supply ducts should already have adequate insulation against excessive heat loss. This same insulation should, therefore, be satisfactory in the summer for protection against heat gain. However, depending on the specific installation, it may be desirable to add to the insulation.

### Step 3 — Install Coil in Supply Air Duct

**NOTE:** For cooling-only units, coil can be installed in either airflow direction. Heat pump applications require specific airflow direction to obtain performance. See Fig. 1.

- When the connecting air supply duct is smaller than the coil inlet opening, construct transition piece so that vertical and horizontal dimensions of transition piece do not increase more than 30° angle. If connecting outlet duct is smaller than outlet opening of coil, limit transition to maximum of 45° angle.
- Provide at least 3 ft (.9m) of straight ductwork preceding coil inlet.
- Support coil from floor or suspend it. When coil is suspended, provide adequate hangers to hold coil.

**NOTE:** When coil is installed over a finished ceiling or living area, a secondary condensate pan must be constructed and installed under entire coil section.

### Step 4 — Refrigerant Line Connections

## ⚠ WARNING

### PERSONAL INJURY HAZARD

Failure to follow this warning could result in personal injury.

Wear eye protection.

Coil is factory charged with 15 psi nitrogen. The coil is under pressure and TXV screen is in place behind liquid line plug. **DO NOT** removed liquid line plug first; always remove the suction line plug first to depressurize the coil.

**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 Table 1. Route refrigerant lines to the coil in a manner that will not obstruct service access to the unit or removal of the filter.

Do not use damaged, dirty, or contaminated tubing because it may plug refrigerant flow-control device. **ALWAYS** evacuate the coil and field-supplied tubing before opening outdoor unit service valves.

Use field-supplied, refrigerant-grade tubing for connection to outdoor units. Suction tube must be insulated. Do not use damaged, dirty, or contaminated tubing because it may plug refrigerant flow-control device. **ALWAYS** evacuate the coil and field-supplied tubing before opening outdoor unit service valves.

### Step 5 — CONNECT REFRIGERANT, LIQUID, and SUCTION LINES

For matched and mismatched systems, use line sizes recommended in outdoor unit Installation Instructions.

## ⚠ 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.

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

See Table 1 for coil connection tube size.

- a. Remove cabinet access door.
- b. Remove rubber plugs, suction plug then liquid plug, from coil stubs using a pulling and twisting motion. Hold coil stubs steady to avoid bending or distorting.
- c. Remove tubing plate with rubber grommets and slide plate with grommets onto the refrigerant lines (field line-set), away from braze joints.
- d. Fit refrigerant lines into coil stubs. Wrap a heat sinking material such as a wet cloth behind braze joints.
- e. Wrap TXV and nearby tubing with a heat-sinking material such as a wet cloth.
- f. Use 1/2 psig Nitrogen purge in the suction and out the liquid line.
- g. Braze using a Sil-Fos or Phos-copper alloy. Do not use soft solder.
- h. After brazing, allow joints to cool. 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.
- i. Leak check connections before insulating entire suction line.
- j. Slide tubing plate with rubber grommets over joints. Position tubing at center of each grommet to ensure an air seal around the tube. Reinstall cabinet door.

**Table 1 – Coil Connection Sizes**

MODEL NUMBER	TONNAGE	COIL CONNECTION TUBE SIZE (IN.)	
		LIQUID	SUCTION
CSPHP2412A(T,L)A	2	3/8	5/8
CSPHP3012A(T,L)A	2-1/2	3/8	3/4
CSPHP3612A(T,L)A	3	3/8	3/4
CSPHP4212A(T,L)A	3-1/2	3/8	7/8
CSPHP4812A(T,L)A	4	3/8	7/8
CSPHP6012A(T,L)A	5	3/8	7/8

## ⚠ CAUTION

### UNIT DAMAGE HAZARD

Failure to follow this caution may result in product damage. To avoid damage while brazing, wrap tubing or fitting with a heat-sinking material, such a wet cloth.

## ⚠ CAUTION

### UNIT DAMAGE HAZARD

Failure to follow this caution may result in property damage. DO NOT BURY MORE THAN 36 IN. OF REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, there must be a 6-in. Vertical rise to the valve connections on the outdoor unit. If more than the recommended length is buried, refrigerant may migrate to cooler buried section during extended periods of unit shutdown, causing refrigerant slugging and possible compressor damage at start-up.

### REFRIGERANT METERING DEVICE

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

**NOTE:** ALL TXV'S HAVE PRESET SUPERHEAT SETTINGS AND ARE FIELD NON-ADJUSTABLE.

### CONDENSATE DRAIN LINE CONNECTION

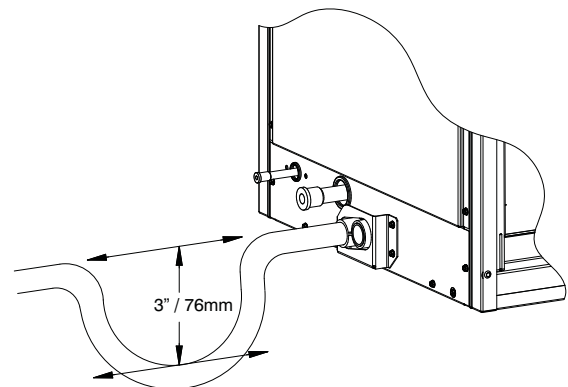
## ⚠ CAUTION

### PROPERTY DAMAGE HAZARD

Failure to follow this caution may result in property damage. When installing over a finished ceiling and/or living area, install a field-fabricated secondary condensate pan under the entire unit.

The coil is designed to dispose of accumulated water through built-in condensate drain fittings. It is recommended that PVC fittings be used on the condensate pan. Do not over-tighten. Finger tighten plus 1-1/2 turns. Be sure to install plastic plug in unused condensate drain fitting. Two 3/4-in. female threaded pipe connections are provided in each coil condensate pan.

A trap is not necessary on the condensate line. Consult local codes for additional restrictions or precautions. If local codes require a trap then the following guidelines are suggested to assure proper drainage. Install a trap in condensate line of coil as close to the coil as possible. Make trap at least 3 in. (76 mm) deep and no higher than the bottom of unit condensate drain opening (See Fig. 2). Pitch condensate line 1 in. (25.4 mm) for every 10 ft. of length to an open drain or sump. Make sure that the outlet of each trap is below its connection to condensate pan to prevent condensate from overflowing the drain pan. Prime all traps, test for leaks, and insulate traps and lines if located above a living area.



**Fig. 2 - Condensate Trap**

A08067

**NOTE:** If unit is located in or above a living space, where damage may result from condensate overflow, a field-supplied, external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place. As an alternative to using an external condensate pan, some localities may allow the running of a separate 3/4-in. (19 mm) condensate line (with appropriate trap) per local code to a place where the condensate will be noticeable. The owner of the structure must be informed that when condensate flows from secondary drain or external condensate pan, the unit requires servicing or water damage will occur. To further protect against water damage, install a float switch to shut the unit off if the water in the secondary pan gets too high.

**NOTE:** To avoid drainage problems, test the primary drain line by slowly pouring water into the pan. Check piping for leaks and proper condensate drainage. Using the secondary drain as explained in the previous note provides further protection against overflow due to a clogged primary drain.

**NOTE:** In applications where return air humidity levels stay at 70% or above for a prolonged period of time, condensation can form on the bottom of pan and drip.

**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 Fig. 3).

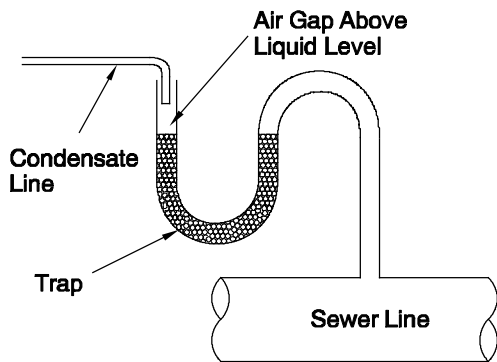


Fig. 3 - Condensate Drain to Waste Line

A10216

**⚠ WARNING**

**EXPLOSION HAZARD**

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

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

**MAINTENANCE**

To ensure optimum performance and to minimize possible equipment problems, periodic maintenance must be performed on this equipment. Consult your dealer on proper frequency of maintenance and the availability of a maintenance contract.

Proper maintenance on this equipment requires certain skills and tools. If you do not possess these, obtain qualified dealer assistance.

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

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

Disconnect all electrical power to air handler (furnace) and outdoor unit before performing any maintenance or service on unit. Units may have more than 1 electrical power supply.

Minimum maintenance should be performed on the equipment as follows:

- a. Check and clean or replace air filter each month or as required.
- b. Check cooling coil, drain pan and condensate drain at start of each cooling season for cleanliness. Clean as needed.

**NOTE:** Because of possible damage to equipment, or personal injury, maintenance should be performed by qualified persons only.

**⚠ CAUTION**

**CUT HAZARD**

Failure to follow this warning could 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.

**A. Air Filter**

An air filter is not provided as an integral part of this cooling coil. However, a field-supplied filter must be used upstream of the coil and must be inspected frequently. When filter becomes clogged with dust or lint, it should be replaced (disposable type) or cleaned (cleanable type). Inspect filter at least once each month and replace or clean at least twice a year (more often if necessary).

**NOTE:** Do not operate coil without a filter in place in return-air duct. Always replace filter with same size and type filter.

**B. Condensate Pan and Drain**

Check drain pan and condensate drain at the same time cooling coil is checked. Clean drain pan and condensate drain thoroughly. Flush pan and drain tube with clear water. If drain tube or trap is restricted, clean with high-pressure water. If this does not work, try a plumber's snake or similar probe device.

**C. Cleaning Coil**

To gain access to coil, it may be necessary to cut a window in ductwork.

After cutting out section of ductwork and cleaning coil, cover opening with new, evenly cut piece of sheet metal and fasten in place with sheet metal screws.

Coil is easily cleaned when dry. Therefore, check and clean coil before each cooling season. Inspect coil periodically during cooling season. If coil is coated with dirt or lint, clean with a vacuum using soft brush attachment. **BE CAREFUL NOT TO BEND COIL FINS.** If coil is coated with oil or grease, disconnect and remove coil from ductwork. Clean coil with mild detergent and water solution. Rinse with clear water.