

A1

HORIZONTAL COILS

INSTALLATION GUIDE & OPERATION MANUAL

A1 REFRIGERANT HORIZONTAL COILS

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1. IMPORTANT SAFETY INSTRUCTION

Potential safety hazards are alerted using the following symbols. The symbol is used in conjunction with terms that indicate the intensity of the hazard. It is the responsibility of the owner and the installer to read and comply with the safety information and the instructions accompanying these symbols.



Read the precautions in this manual carefully before operating the unit.



Read the instructions in this manual carefully before operating the unit.



Read the instructions in this manual carefully before servicing the unit.



Read the instructions in this manual carefully before wiring the unit.



Warning or Caution



WARNING

This symbol indicates a potentially hazardous situation, which if not avoided, could result in serious injury, property damage, product damage or death.



CAUTION

This symbol indicates a potentially hazardous situation, which if not avoided, may result in moderate injury or property damage.



WARNING

Certified technicians or those individuals meeting the requirements specified by NATE may use this information. Property and product damage or personal injury hazard may occur without such background.

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.

Product designed and manufactured to permit installation in accordance with local and national building codes. It is the installer's responsibility to ensure that the product is installed in strict compliance with the aforementioned codes. Manufacturer assumes no responsibility for damage (personal, product or property) caused due to installations violating regulations.



WARNING

Disconnect ALL power before servicing or installing this unit. Multiple power sources may be present. Failure to do so may cause property damage, personal injury, or death.



WARNING Do not bypass safety devices.



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

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

This appliance is not intended for use at altitudes exceeding 2,000 meters.

2. INSPECTION

On receiving the product, visually inspect it for any major shipping related damages. Shipping damages are the carrier's responsibility. Inspect the product labels to verify the model number and options are in accordance with your order. The manufacturer will not accept damage claims for incorrectly shipped product.

3. CODES & REGULATIONS

This product is designed and manufactured to comply with national codes. The product shall be installed in accordance with national wiring regulations. It is the responsibility of the installer to follow such codes and / or prevailing local codes / regulations. Compliance with national gas regulations shall be observed. The manufacturer assumes no responsibility for equipment installed in violation of any codes or regulations.

4. INSTALLATION PREPARATION

Read all the instructions in this guideline carefully while paying special attention to the WARNING and CAUTION alerts. If any of the instructions are unclear, clarify with a certified technician before proceeding. Gather all tools needed for successful installation of the unit prior to beginning the installation.



NOTICE

Absence of pressure/charge does not verify a leak. Check coils for leaks prior to installation.

Assure that the maximum operating pressure is considered when connecting any evaporator unit or condenser unit.

Refer to Section 10 of this manual for refrigerant charging instructions.



WARNING

PARTIAL UNITS shall only be connected to an appliance suitable for the same refrigerant.

These product families, models CP/DP, CX/DX, & CH/DH, are PARTIAL UNIT AIR CONDITIONERS, complying with PARTIAL UNIT requirements of UL 60335-2-40 Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this Standard (UL 60335-2-40).

The appliance shall be installed in accordance with national regulations. This product was tested at an external static pressure of 0.66" W.C. None of the components in this product family are designed or approved to be suitable for outdoor use.

Refrigerant lines must be routed to allow the minimum required clearance of 24" for service. Consult all appropriate regulatory codes prior to determining final clearances.

5. CONDENSATE DRAIN PREPARATION

Aspen recommends an auxiliary drain pan be provided and installed by the installing contractor, which should be properly sloped, installed according to code, and terminated in an area visible to the homeowner. The auxiliary pans provide extra protection to the area under the unit should the primary and secondary drain clogged up and overflow.

WARNING As expressed in our product warranty; ASPEN WILL NOT BE BILLED FOR ANY STRUCTURAL DAMAGES CAUSE BY FAILURE TO FOLLOW THIS INSTALLATION REQUIREMENT.

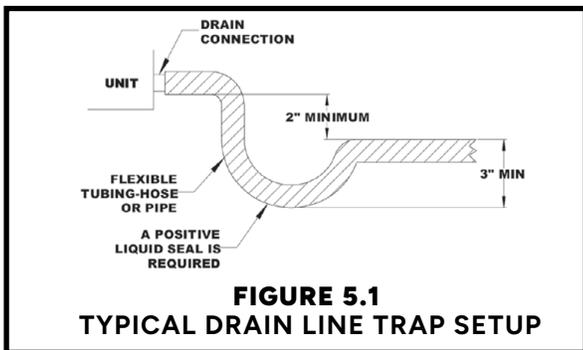
CAUTION Drain lines from the auxiliary drain pan should NOT be connected to the primary drain line of the coil.

WARNING Do NOT install coils with standard temperature drain pan with oil furnaces or applications where temperature of the drain pan might exceed 290 °F. A metal pan should be installed. Failure to follow this warning may result in property damage and/or personal injury.

Install coils with the drain pan and/or casing on a flat, level surface. Slope the coil 1/4" towards the drain. Condensate lines must be installed in accordance with building codes. It is the contractor's responsibility to ensure proper condensate drainage at the time of the installation; Aspen bears no responsibility for damages caused by improper condensate management.

CAUTION Some coils have primary and secondary drain ports on both sides of the pan to offer installation flexibility, so ensure all threaded plugs are in present and tightened in any unused drain ports. These may be hidden behind the coil casing access door. Failure to do so may result in property water damage; it is the contractor's responsibility to ensure these plugs are present and tight.

The drain lines must be installed with 1/4" per foot pitch to provide free drainage. A condensate trap MUST be installed on the primary drain line to ensure proper drainage of the condensate. The trap must be installed in the drain line below the bottom of the drain pan. Fig. 5-1 illustrates the typical drain trap installation. Prior to installation, ensure drain pan hole is not obstructed. Additionally, Aspen recommends the drain lines be insulated to prevent sweating and dripping.



CAUTION Use Teflon tape to connect the drain lines to the threads in the drain pan. DO NOT USE SOLVENT BASED PIPE DOPE. THIS WILL REDUCE THE LIFE OF THE PAN.

The drain pan has primary (white) and secondary (red) drain connections. If a secondary drain line is required, it should be run separately from the primary and should terminate in a highly visible location. Condensate disposal through the secondary drain line indicates that the primary drain line is plugged and needs cleaning. If a secondary drain line will not be provided, plug the secondary drain. Drain plugs are NOT to be reused without plumbers' tape or putty. Drain line

connection should be finger tightened, then turned no more than one complete turn as needed to ensure a firm connection. DO NOT over-tighten connection or damage may occur.

6. COIL INSTALLATION

WARNING The coil is manufactured with dry nitrogen pre-charge. Release the pressure through the Schrader valve test port prior to installation. If holding pressure is not present, return coil to distributor for exchange.

NOTICE Refrigerant tubing must be routed to allow accessibility for service and maintenance of the unit.

Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:

The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.

Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected. REFER TO SECTION 10 FOR SYSTEM CHARGING INSTRUCTIONS.

Clean coil fins with degreasing agent or mild detergent and rinse fins clean prior to installation. Refer to Section 10 of this manual for coil cleaning / maintenance guidance.

The refrigerant line sizes should be selected according to the recommendations of the outdoor unit manufacturer.

Care must be taken to ensure all connection joints are burr-free and clean. Failure to do so may increase chances of a leak. It is recommended to use a pipe cutter to remove the spun closed end of the suction line.

To reduce air leakage, rubber grommets may be present where the lines pass through the coil case. To avoid damage, remove grommets prior to brazing by sliding over the lines. Use a quenching cloth or allow the lines to cool before re-installing the grommets.

Use of wet rags/quenching cloth is highly recommended to prevent weld-related damage to the casing and Schrader valve (if present).

CAUTION Coil should be installed on the discharge side of the furnace.

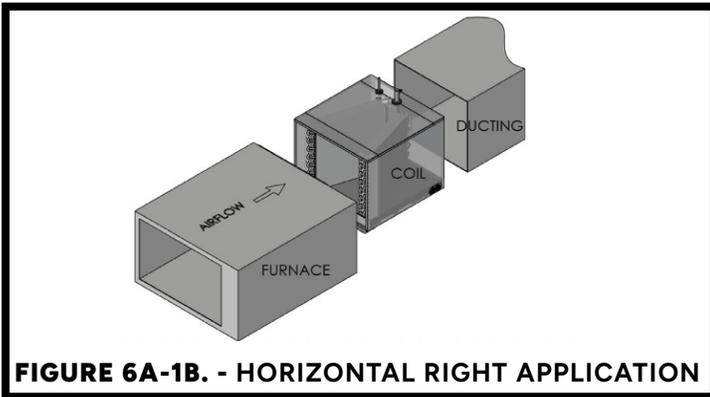
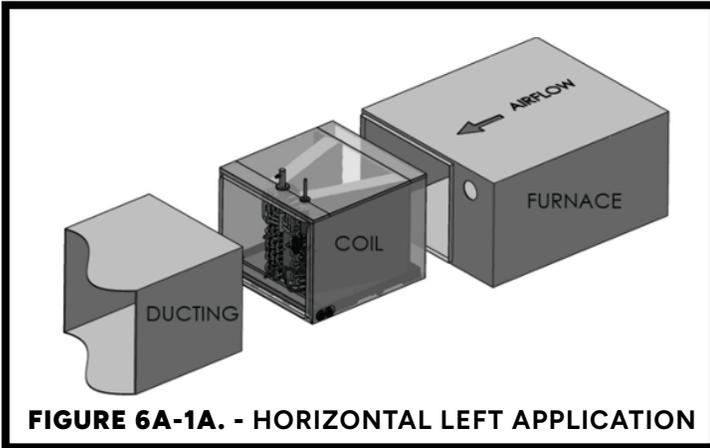
CAUTION Aspen coils may include a Schrader valve on the suction manifold. Ensure that the Schrader valve and valve core (where present) are protected from heat to prevent leakage.

WARNING As mentioned elsewhere in this document, in an application involving oil furnace a metal drain pan **MUST** be used. Coils installed on an oil furnace must have a minimum of six inches clearance between the top of the furnace and bottom of the drain pan.

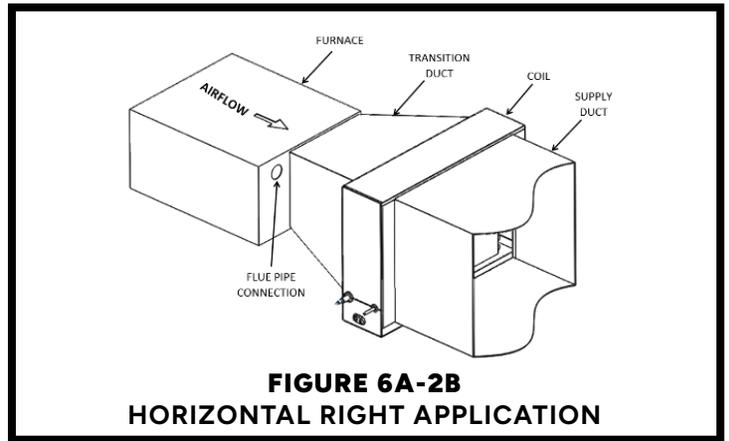
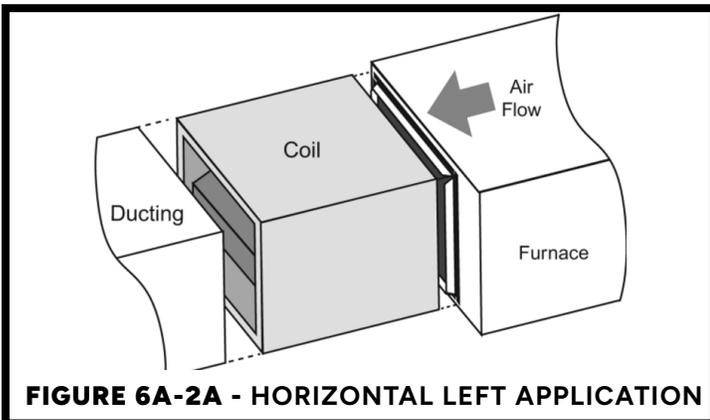
6A. DEDICATED HORIZONTAL COIL ORIENTATION

CAUTION Duct work must be installed in accordance with the local building codes. Aspen will not be liable for damages caused due by non conformance to local building codes.

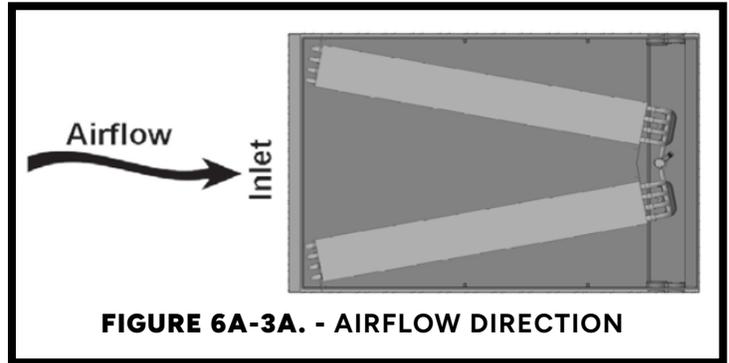
1. CP/DP/CX/DX ORIENTATION



1. CH ORIENTATION

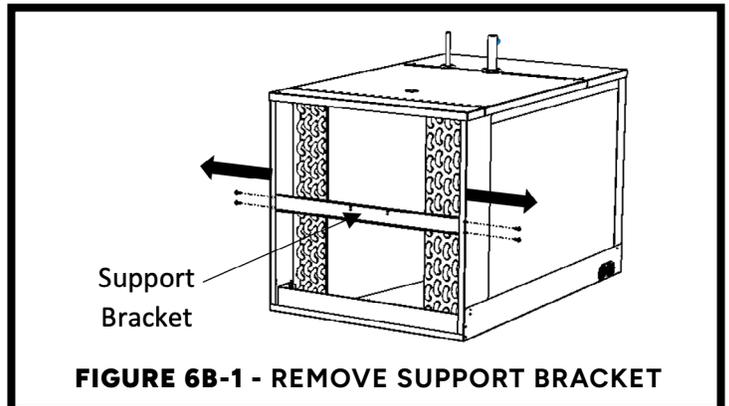


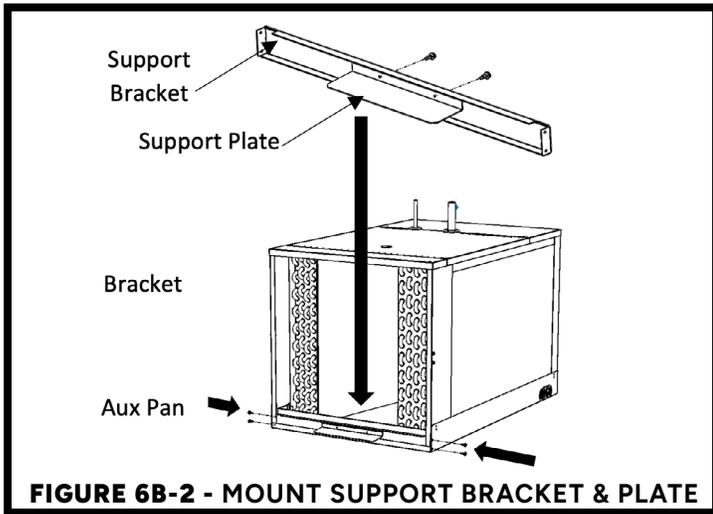
Airflow enters through the inlet of the coil and exits at the outlet, entering the interior of the enclosure for routing to the attached ductwork.



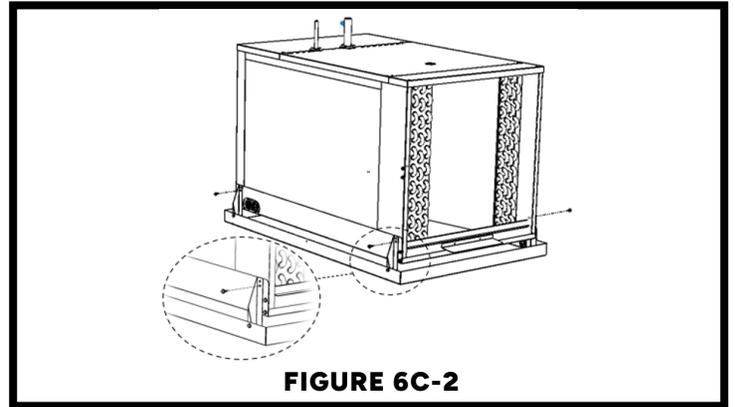
6B. MOUNTING DEDICATED HORIZONTAL COIL TO FURNACE

1. For CP/DP, remove support bracket by loosening 2 screws on each side of the cabinet prior to installation and set aside. See Fig 6B-1
2. For CP/DP, assemble the mounting support plate and support bracket. Mount the support bracket and plate assembly on the lower portion of the cabinet opening. The assembly will guide in mounting the coil cabinet towards the furnace. See Fig 6B-2
3. For CH/DH, locate the air outlet of the furnace. Install transition duct. Align the horizontal flat coil into the transition duct. Place supply ductwork over the casing. See Fig 6A-2 a & b for correct orientation.





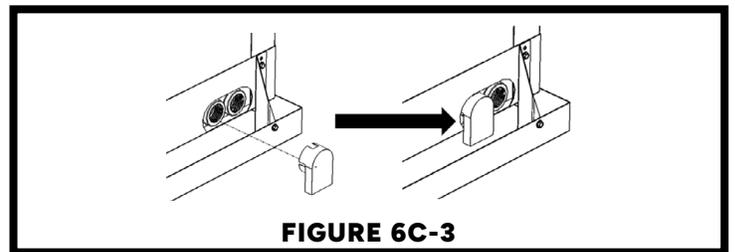
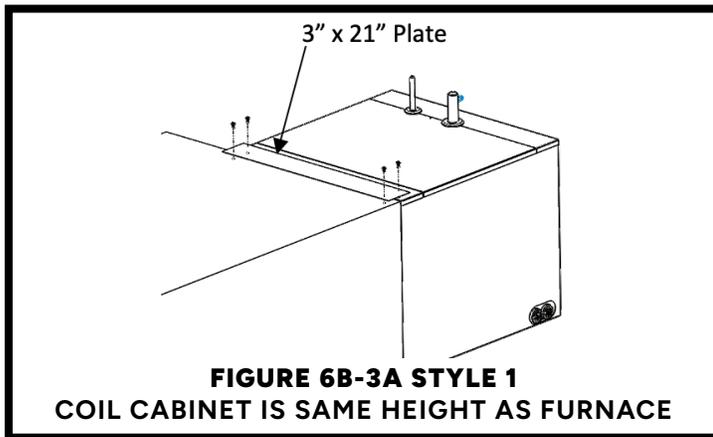
2. Mount the auxiliary pan bracket in the coil cabinet as per desired position. 2 holes are provided on each 4 corners of the coil cabinet for adjust-ability purposes.



4. For Style 1 CP/DP/CX/DX where coil cabinet is same height as furnace – 3"x21" plate is provided to secure the mounting of furnace and coil cabinet. See Fig 6B-3a.

For Style 2 CP/DP/CX/DX where coil cabinet is taller than furnace – Transition plate is provided to match height of furnace. See Fig 6B-3b.

3. Attached the auxiliary drain adapter on the auxiliary drain port. Adapter opening should be facing down.



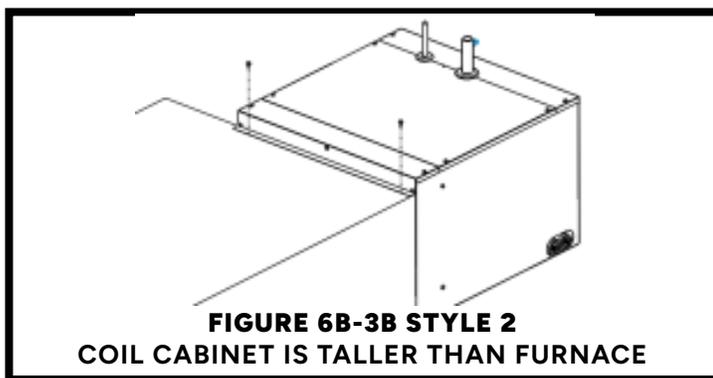
Refer to Furnace/Air Handler manufacturer literature for specific coil installation guidelines and recommendations.

CAUTION Due to higher designed radiant heat, a field fabricated 6.0" spacer (placed between the furnace exit and the inlet of the evaporator) should be installed when matching up an Aspen coil with an ultra-low NOx (ULN) furnace.

7. SUCTION LINE CONNECTION

CAUTION Aspen coils may include a Schrader valve on the suction manifold. Ensure that the Schrader valve and valve core (where present) are protected from heat to prevent leakage.

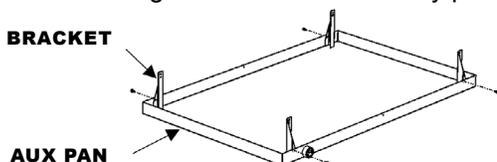
1. Ensure suction line connection joints are burr-free and clean. Failure to do so may increase chances of a leak and introduce contaminants to the system. It is recommended to use a pipe cutter to remove the spun closed end of the suction line.
2. Swage (or use a field supplied coupler) and braze the field supplied refrigerant suction line tubing to the coil stub using approved industry practices.



WARNING Do not attempt to touch brazed joints while hot. Severe burns may result.

6C. MOUNTING AUXILIARY PAN (CP/DP ONLY)

1. Using the 4-screw provided, Attached the four-mounting bracket on the auxiliary pan.



8. METERING DEVICES/LIQUID LINE CONNECTION

Aspen coils are available with two kinds of metering devices a) flowrator or b) TXV. The following instructions are separated into sections by metering device

8A. FLOWRATOR COILS

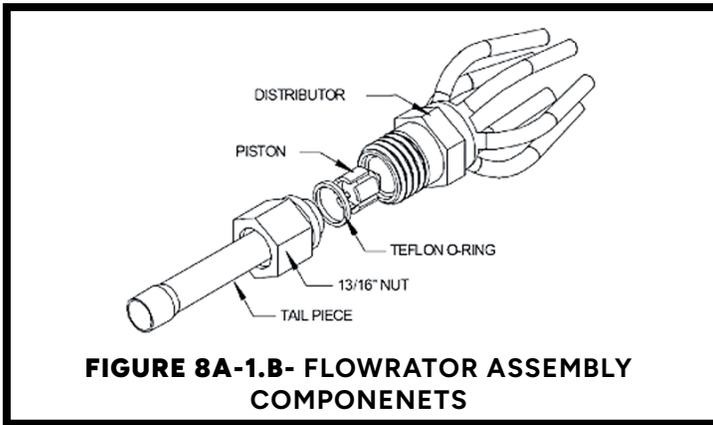


FIGURE 8A-1.B- FLOWRATOR ASSEMBLY COMPONENTS

CAUTION

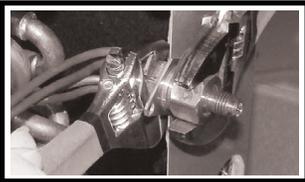
Use Piston sizes recommended by the outdoor unit manufacturer whenever possible. The piston should be sized according to the capacity of the outdoor unit.

WARNING

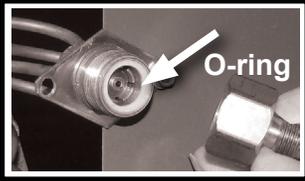
Failure to install the proper piston can lead to poor system performance and possible compressor damage.

I. INSTALLATION

NOTE: Photos are for basic illustration / reference purposes only. Actual equipment configuration may differ from that shown.



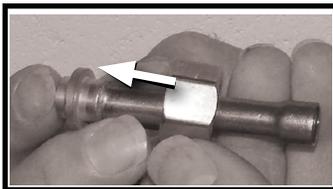
I-1. Disassemble flowrator body using two wrenches and unscrewing with a counterclockwise motion.



I-2. Replace the Teflon O-ring (located between the halves). Discard Schrader if present.

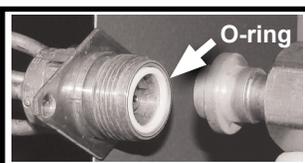
CAUTION

Be aware of the Teflon O-ring. Be sure to replace the O-ring to attain a proper seal. (The Teflon O-ring is located between the two halves of the flowrator).



I-3. Slide the attachment nut onto the liquid line stub out.

I-4. Braze the stub-out portion to the liquid line and let cool.



I-5. Taking care that the white Teflon seal is still in place inside the flowrator body, firmly seat the stub and screw the attachment

nut to flowrater body.

I-6. Tighten nut using no more than 10 ft-lbs of torque. A flare nut open end wrench is recommended to evenly distribute the force across all six sides of the nut to ensure piston body is not deformed.

II. PISTON REPLACEMENT

NOTE: Photos are for basic illustration / reference purposes only. Actual equipment configuration may differ from that shown.

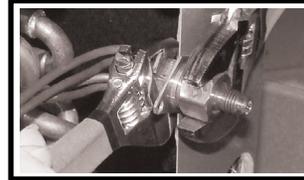


FIGURE 8A-2

During some installations, a piston change may be required. If so, the installer **MUST** change the piston. Use piston sizes recommended by the outdoor unit manufacturer.

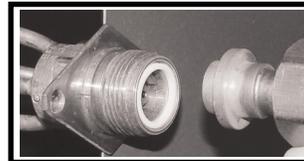
II-1. Evacuate the system as per manufacturer guidelines and recommendations.

II-2. Turn the 13/16" nut once to release any residual pressure in the coil.

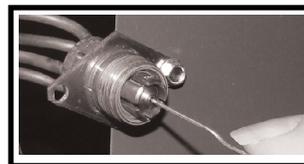


II-3. After ensuring that the coil is free of any residual pressure, disassemble the flowrator body completely using two wrenches. Take great care not to distort the

feeder tubes. The wrench used to clasp the nut should be turned in counterclockwise direction to unscrew the nut.

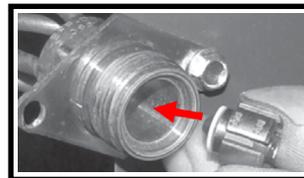


II-4. Slide the 13/16" nut over the line-set and separate the two halves of the flowrator.



II-5. Pull the piston out using a small wire or pick. Verify the piston size (size is typically stamped on the body of the piston - Fig 7.6).

If a different piston size is required by the outdoor unit manufacturer, replace the piston using the small wire provided with the piston kit.



II-6. Replace the piston with one of the correct size. Do not force the new piston into the body. Make sure the piston moves freely in body.

CAUTION

Pay close attention to the piston orientation. The pointed end of the piston **MUST** go into the distributor body, towards the coil. Failure to ensure this orientation will cause the piston to be bypassed during operation which might damage the outdoor unit.

II-7. Assemble the two halves correctly and ensure that the

Teflon O-ring is present between the two halves (See I-5). Slide the 13/16" nut onto the distributor body.

CAUTION Be aware of the Teflon O-ring. Be sure to replace the O-ring to attain a proper seal. (The Teflon O-ring is located between the two halves of the flowrater).

II-8. Tighten the nut to a torque of approximately 10 ft-lbs. Do NOT over-tighten the nut. Over-tightening could crack the nut and/or impede the piston movement during operation.

II-9. If present, slide the rubber grommet back to position to prevent air leakage.

8B. TXV COILS

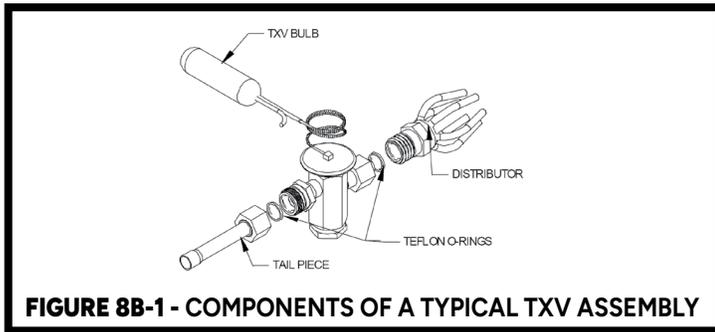


FIGURE 8B-1 - COMPONENTS OF A TYPICAL TXV ASSEMBLY

WARNING The sensing bulb and TXV body **MUST** be protected from overheating during brazing. The sensing bulb and TXV body must be covered using a quench cloth or wet cloth when brazing. Pointing the brazing flame away from the valve and sensing bulb provide partial protection only.

WARNING Ensure that the TXV selected is compatible with the refrigerant used in the outdoor system. The TXV body is marked with R410A or R22

WARNING The valves should be sized according to the capacity of the outdoor unit. Failure to install the right valve can lead to poor performance and possible compressor damage.

I. TXV BULB HORIZONTAL MOUNTING

The orientation and location of the TXV bulb has a major influence on the system performance.

WARNING Ensure that the TXV bulb is in direct contact with the suction/vapor line. Gap between the bulb and tube should be avoided. Failure to do so will impair the proper functioning of the TXV valve.

It is recommended that the TXV bulb be installed parallel to the ground (on a horizontal plane). The bulb position should be at 2 o'clock or 10 o'clock. Fig. 8B-2 shows the recommended position for the TXV bulb installation in the horizontal plane.

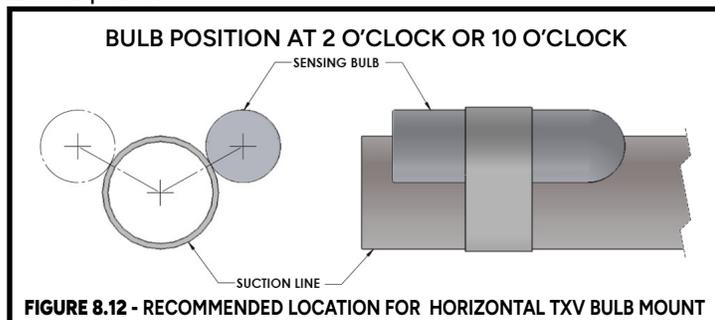


FIGURE 8.12 - RECOMMENDED LOCATION FOR HORIZONTAL TXV BULB MOUNT

The TXV sensing bulb **SHOULD** be mounted on the suction line approximately 6" from the TXV or coil housing using the metal clamp provided. In order to obtain a good temperature reading and correct superheat control, the TXV sensing bulb must conform to ALL of the following criteria:

1. The sensing bulb **MUST** be in direct and continuous contact with the suction line.
2. The sensing bulb should be mounted horizontally on the suction line.
3. The sensing bulb **MUST** be mounted at the 2 o'clock or 10 o'clock position on the circumference of the suction line.
4. The sensing bulb **MUST** be insulated from outside air.

A properly mounted sensing bulb will prevent false readings caused by liquid refrigerant that may have formed inside the suction/vapor line. Insulation will protect the sensing bulb from false readings due to contact with warm air.

II. TXV BULB VERTICAL MOUNTING

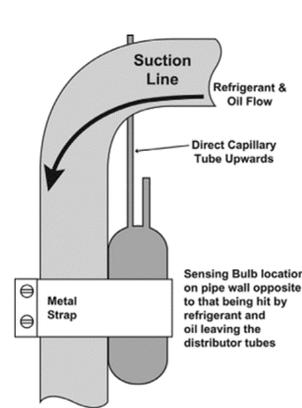


FIGURE 7B-3 - RECOMMENDED LOCATION FOR VERTICAL TXV BULB MOUNT

As recommended in Section 7B-I, the TXV sensing bulb should be mounted in a horizontal plane in relation to the suction/vapor line. However, some installation configurations may require that the sensing bulb be mounted vertically. In this instance, place the bulb opposite the piping wall being hit by refrigerant and oil leaving the distributor tubes, and with capillary tubes directed upwards as shown in Fig. 7B-3.

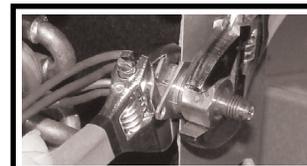
CAUTION If the TXV sensing bulb is mounted vertically; the capillary **MUST** be directed upwards. The bulb must be mounted on the wall opposite to that being directly hit by the refrigerant and oil leaving the distributor tubes.

III. FIELD-INSTALLED TXV RETROFIT

Note: Photos are for basic illustration purposes only. Actual equipment configuration may differ from that shown.

WARNING Do not attempt to touch brazed joints while hot. Severe burns may result.

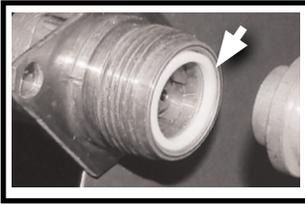
When installing an expansion valve, it is not necessary to slide the coil out of the housing.



III-1. Disassemble the flowrater body using two wrenches. Unscrew the body with a counterclockwise motion.

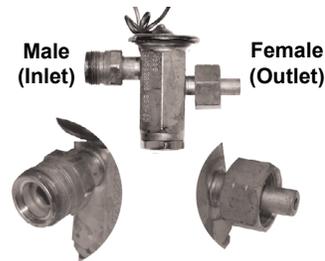


III-2. Remove the existing flowrater piston using a small wire or pick.



III-3. Replace the Teflon O-ring seal in place (located between the halves).

III-4. Inspect the TXV box to confirm that the valve is compatible with the refrigerant in the system.



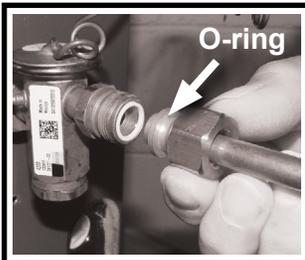
III-5. Remove the valve from the box and note the location of the inlet side (threaded male port) and the outlet side (female swivel nut port).



III-6. After ensuring that the Teflon O-ring seal is still in place inside the flowrater body, screw the female swivel nut onto the flowrater body.

III-7. Slide attachment the nut onto the liquid line stub out (See Section 8.1.1, I-3, Fig. 8.4)

III-8. Braze the stub-out portion to the liquid line and let cool.



III-9. Remove the additional Teflon O-ring seal from the box and place on the shoulder just inside the TXV inlet port. Screw the nut attached to the stub-out portion of the flowrater body onto the inlet port of the TXV.

III-10. Tighten all connections taking care to use proper back up. Tighten the nut to a torque of approximately 10-30 ft-lbs.

III-11. Remove the valve identification sticker from the valve and place it adjacent to the Aspen model number on unit name plate.

III-12A. Some Aspen coils come with a Schrader valve on the suction line. **If a Schrader port is present:**



A. Remove the valve stem from the Schrader port mounted on the suction line.



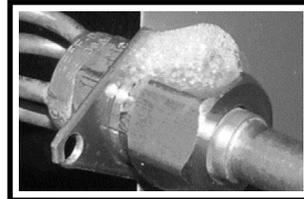
B. Screw flare nut on TXV equalization tube on to the Schrader valve stem.

CAUTION When handling or manipulating the equalizer tube, take great care not to kink or make extreme bends in the tubing.

CAUTION Using a non-bleed expansion valve may require the use of a hard-start kit. Follow the outdoor unit manufacturer's guidelines.

9. LEAK CHECK

1. Following outdoor unit manufacturer instructions and recommendations, charge the system with dry nitrogen to a maximum pressure of 150 PSIG.



2. Check all brazed and screw-on line connections by applying a soap solution to the joint. A leak will produce bubbles in the soap solution.

3. If any leaks are discovered, remove nitrogen pressure and repair leaks. Repeat steps 1-3.

4. With no leaks or weak connections present, evacuate the system and charge as per the outdoor unit manufacturer instructions and specifications.

10. SYSTEM CHARGING

CAUTION An improperly charged system will likely cause loss in system performance and may damage the compressor.

CAUTION Refer to outdoor unit manufacturer charging guidelines and recommendations. The recommendations given below are general in nature and are NOT to supersede outdoor unit manufacturer specifications.

Where addition of charge is required to complete installation, instructions on how to determine the additional REFRIGERANT CHARGE and how to complete the REFRIGERANT CHARGE on the label provided by the outdoor unit manufacturer adjacent to the nameplate if the compressor bearing unit. Interconnecting refrigerant piping length and diameter shall be taken into consideration.

PISTON / FIXED ORIFICE COIL:

Add refrigerant until the superheat measured at the outdoor unit suction/vapor line **matches the superheat recommendations of the outdoor manufacturer.**

TXV COILS:

If the unit is equipped with an **adjustable TXV**, add refrigerant until the subcooling measures at the outdoor unit liquid line **matches the subcooling recommendations of the outdoor manufacturer.** If the charge is unavailable charge the unit to a subcooling value of 8°F +/- 1°F.

NOTICE When adjusting the TXV, the valve stem or adjusting screw should not be adjusted more than a ¼ turn at a time. To adjust superheat, turn the valve stem clockwise to increase and counterclockwise to decrease.

1. If subcooling and superheat are low, adjust TXV to 8°F +/- 1°F superheat, then check subcooling.
2. If subcooling is low and superheat is high, add charge to raise subcooling to 8°F +/- 1°F then check superheat.
3. If subcooling and superheat are high, adjust TXV valve to 8°F +/- 1°F superheat, then check subcooling.
4. If subcooling is high and superheat is low, adjust TXV valve to 8°F +/- 1°F superheat and remove charge to lower the subcooling to 8°F +/- 1°F.

The TXV should NOT be adjusted at light load / ambient conditions of 60°F or below.

11. COIL CLEANING INSTRUCTIONS



WARNING

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacture.

Aspen cased coils are equipped with a two-piece panel door to allow for cleaning and maintenance access. Remove one or both doors to access the coil for cleaning.

For both copper and aluminum tube coils, it is recommended to flush with the coil with water. There are coil cleaners that are available that contain corrosive chemicals, such as, but not limited to, chlorine and hydroxide, that are not approved for use on Aspen copper and aluminum tube coils.



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In keeping with its commitment to continuous improvement, Aspen Manufacturing reserves the right to make changes without notice and incurring obligation. To stay up-to-date with this product and Aspen's trusted line of coils, air handlers, and more, go to our website at www.aspenmfg.com.



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