

INSTALLATION INSTRUCTIONS

21" coils

AIR CONDITIONING INDOOR COILS AND ACCESSORIES FOR RESIDENTIAL ELECTRIC FURNACES

INTRODUCTION

Please note that HUD Manufactured Home Construction and Safety Standard Section 3280.714, paragraph (a) and subparagraph (4) and (5) clearly specifies when a cooling or heat pump coil and air conditioner blower are installed with a furnace or heating appliance they shall be tested and listed in combination for heating and safety performance by a nationally recognized testing agency(ies). Additionally, the cooling or heat pump systems to be installed in Manufactured Housing shall be certified, listed and rated based on US Department of Energy test procedures which are listed by AHRI and shall be tested and listed in combination for heating and safety performance by a nationally recognized testing agency(ies).

These instructions are primarily intended to assist qualified individuals trained and experienced in the proper installation of this type of equipment. Some state codes require installation and service personnel to be licensed. Refer to authorities having jurisdiction for additional guidance. Remember that the Clean Air Act of 1990 requires technician certification for handling refrigerant.

NOTE: EFFICIENCY AND CAPACITY RATINGS ARE LISTED IN CURRENT AHRI UNITARY DIRECTORY [UNDER SUMMIT MANUFACTURING] FOR COIL MODEL NUMBERS MATCHED WITH OUTDOOR CONDENSING OR HEAT PUMP UNITS. AIR CONDITIONING COIL MATCHES ARE LISTED IN INDOOR COIL MANUFACTURER AIR CONDITIONING SECTION. HEAT PUMP COIL MATCHES ARE LISTED IN INDOOR COIL MANUFACTURER HEAT PUMP SECTION. INCORRECTLY MATCHED SYSTEMS MAY NOT WORK PROPERLY AND MAY VOID MANUFACTURER LIMITED WARRANTY.

CAUTION!

All sweat coils are shipped from factory pressurized with nitrogen. Relieve nitrogen pressure before opening the refrigerant circuit.



ATTENTION!

Some coils have a TXV as the metering device. However, the sensor bulb is not mounted due to potential heat damage and / or proper bulb location. Therefore, after the suction and liquid line have been properly connected to the coil the bulb can be mounted on the suction. Many times, due to space limitations in the manufactured housing applications it will require the sensor bulb to be mounted vertically. If that is the case the bulb should be located at least 6" away from any bend (elbow) and fastened on the tubing side opposite the plane of the bend. The bulb should be insulated using the thermal insulation to protect it from the effects of the surrounding ambient temperature. (SEE PAGE 7)

NOTE!

Coils and other accessories installed when air conditioning is added to manufactured housing furnaces will comply with HUD regulations requiring third party approvals. Efficiency and capacity ratings as required by HUD are listed in the current AHRI directory for matched with the outdoor units. These coil ratings are based on air quantities consistent with those that are encountered in typical manufactured housing air condition and heat pump applications.

GENERAL COIL INSTALLATION NOTES

1. All coils are shipped pressurized with Nitrogen.
ALL COILS SHOULD BE CHECKED FOR PRESSURE BEFORE LEAVING THE DISTRIBUTOR OR BEFORE INSTALLATION! IF THERE IS NO PRESSURE PRESENT, THE COIL MAY HAVE DEVELOPED A LEAK DURING SHIPMENT AND SHOULD BE RETURNED TO THE POINT OF PURCHASE FOR EXCHANGE.
To test for pressure on a sweat connect coil, remove the cap or flare nut on the Schrader fitting and depress the core valve located on the suction manifold.
2. The blower and duct system must be properly sized in order to provide adequate cooling and heating performance. Select the correct motor speed tap on the furnace blower to give the required CFM needed for rated cooling capacity or upgrade the blower assembly to attain the proper CFM. Return air filters of generous size must be provided, in order to avoid contaminating the coil, blower and ductwork, or restricting necessary airflow. Failure to deliver the proper air flow across the indoor coil will cause system and/or component problems, i.e. TXV performance problems.
3. **It is essential that the indoor coil and outdoor unit be properly matched and charged with the proper amount of refrigerant.** Incorrect charge levels will result in inefficient operation. See more details in installation instructions for the outdoor unit.
4. For optimum performance and efficiency of air conditioning or heat pump coils, adjust system charge and/or industry standards superheat / sub cooling.
5. It is recommended that the coil be sprayed with liquid detergent thoroughly and rinsed thoroughly before installation to assure proper drainage of condensate from the coil fins to eliminate water blowoff and to assure maximum coil performance. If not sprayed, approximately 50 hours of break in time is required to achieve the same results.
6. Always be sure coil is installed level or sloped slightly toward primary and secondary (the higher of the two) drain fittings. If mandated by code, connect both drain lines to open drain, but never to a closed sewer. Pitch drain lines away from drain pan. **Always**, test drain lines with water before operating. This step is mandatory in all manufactured housing installations. Reduction in size of the drain lines is not recommended and many times not allowed.
7. **A WATER TRAP IS RECOMMENDED ON ALL COIL APPLICATIONS, BUT IS REQUIRED ON PULL THROUGH INSTALLATIONS ON ELECTRIC FURNACES. FAILURE TO PROVIDE CAN RESULT IN IMPROPER DRAINAGE OR POTENTIAL SHOCK HAZARD.**

ATTENTION!

Review all local codes for correct condensate management including but not limited to secondary drain connections, safety cut-off installations and condensate water disposal

8. Refrigerant piping is critical on any coil installation when the outdoor unit is to be located below the level of the coil. For proper piping design considerations, refer to the guidelines furnished by the manufacturer of the outdoor unit.
9. Check all field installed refrigerant connections with electronic leak detector, halide torch, or soap bubbles.
10. Refer to installation instructions provided with the outdoor unit, gas or electric furnace, and line sets for completion of system installation.
11. Apply insulation (see accessory packet) to the lower surface of the coil pan



12. Install condensate drain fittings (field supplied) and drain lines ein accordance with local requirements, being certain that condensate will drain properly. Utilize the openings on the left side of the drain pan-see below



For Downflow applications-see pages 4-5

For Upflow Applications-see page 6

INSTALLATION INSTRUCTIONS

AIR CONDITIONING & HEAT PUMP ACCESSORY KIT

21" INCH ("C") WIDTH CABINET DOWNFLOW FURNACES

IMPORTANT - These instructions are intended for the use by qualified service technician specially trained and experienced in installation of this type of equipment and related system components.

Installation and service personnel are required by some states to be licensed. Persons not qualified shall not install this equipment or interpret these instructions.

WARNING

Improper installation or service may damage equipment, or create a hazard and void the warranty. The use of other components not tested in combination with these units may make the equipment in violation of state codes, may create a hazard and may ruin the equipment. In addition, the National Mobile Home Construction and Safety Standards Act and its regulations require the use of components tested or certified by a nationally recognized testing laboratory in all manufactured homes constructed or sold subject to that act. Carefully follow all instructions and warnings in this booklet to avoid damage to the equipment, personal injury or fire.

NOTE: The words "Shall" or "Must" indicate a requirement which is essential to satisfactory and safe product performance.

The words "Should" or "May" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

APPLICATION

This package contains the following parts:

– Installation Manual

1- Rear Coil Support Bracket (*Downflow use only-discard*)-air handler filter bracket typically supplies rear close-off in upflow configurations

1- Secondary Lineset Connection Door

1-Sheet Metal Screws

All of the above items are designed for use on the 21" wide series electric furnaces for manufactured housing. This package is required when an air conditioning or heat pump with an indoor coil is added to the electric furnace in the downflow configuration.

WARNING

SHOCK HAZARD - Be sure to turn the electrical power: "OFF" at the main electrical service entrance box, and lock it to prevent the possibility of personal injury or damage to the equipment.

INSTALLATION OF COIL SUPPORT

1. Remove furnace door.
2. Turn circuit breakers to "OFF".
3. Remove the Rear Coil Support Bracket (Fig 1) from the carton.

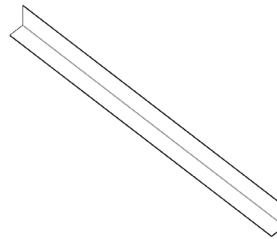


Figure 1: Rear Coil Support Bracket (Only required for downflow position).

4. The Rear Coil Support Bracket is placed inside the cabinet on top of the coil support rails, along the rear and secured in place with foil tape. Figure 2.

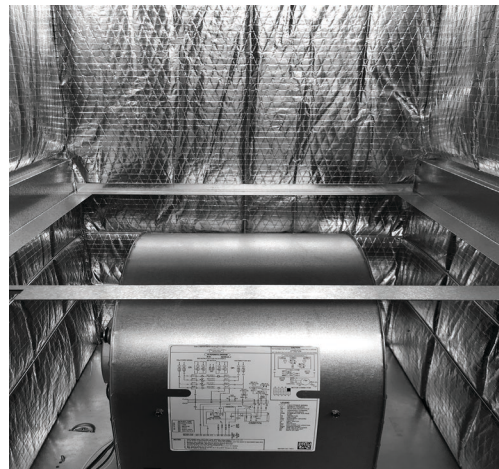


Figure 2

5. After installing coil, install secondary lineset connection door BEFORE connecting linesets

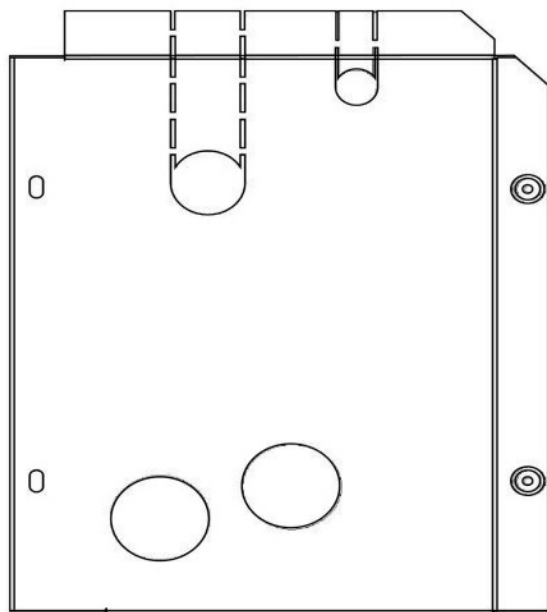


Figure 3-secondary door

Note: The cutouts may be utilized for ease of installation of the secondary door.
Be certain to seal all openings-see CAUTION below

10. Install main coil cabinet door

▲ WARNING

Failure to install condensate trap can result in damage to equipment and/or personal injury.

▲ CAUTION

All areas around the line sets drain hoses and other openings in the furnace should be sealed air tight. Use some moldable compound or caulking to seal the area. Failure to do so may result in loss of performance and premature compressor failure.

INSTALLATION INSTRUCTIONS

AIR CONDITIONING & HEAT PUMP ACCESSORY KIT

21" INCH ("C") WIDTH CABINET UPFLOW ELCTRIC FURNACES

IMPORTANT - These instructions are intended for the use by qualified service technician specially trained and experienced in installation of this type of equipment and related system components.

Installation and service personnel are required by some states to be licensed. Persons not qualified shall not install this equipment or interpret these instructions.

▲ WARNING

Improper installation or service may damage equipment, or create a hazard and void the warranty.

The use of other components not tested in combination with these units may make the equipment in violation of state codes, may create a hazard and may ruin the equipment. In addition, the National Mobile Home Construction and Safety Standards Act and its regulations require the use of components tested or certified by a nationally recognized testing laboratory in all manufactured homes constructed or sold subject to that act.

Carefully follow all instructions and warnings in this booklet to avoid damage to the equipment, personal injury or fire.

NOTE: The words "Shall" or "Must" indicate a requirement which is essential to satisfactory and safe product performance.

The words "Should" or "May" indicate a recommendation or advice which is not essential and not required but which may be useful or helpful.

APPLICATION

This package contains the following parts:

– Installation Manual

1- Rear Coil Support Bracket (Downflow use only)

1- Secondary Lineset Connection Door

1-Sheet Metal Screws

All of the above items are designed for use on the 21" wide series electric furnaces for manufactured housing. This package is required when an air conditioning or heat pump with an indoor coil is added to the electric furnace in the upflow configuration.

▲ WARNING

SHOCK HAZARD - Be sure to turn the electrical power: "OFF" at the main electrical service entrance box, and lock it to prevent the possibility of personal injury or damage to the equipment.

INSTALLATION OF COIL SUPPORT

1. Remove furnace door.
2. Install coil using existing coil support rails
3. Install Secondary Lineset Connection Door



Note: The cutouts may be utilized for ease of installation of the secondary door. Be certain to seal all openings-see CAUTION below

4. Install main coil cabinet door
5. Turn circuit breakers to "ON"

▲ WARNING

Failure to install condensate trap can result in damage to equipment and/or personal injury.

▲ CAUTION

All areas around the line sets, drain hoses and other openings in the furnace should be sealed air tight. Use some moldable compound or caulking to seal the area. Failure to do so may result in loss of performance and premature compressor failure.

THERMAL EXPANSION VALVE INSTALLATION INSTRUCTIONS

A. INTRODUCTION

Thermal expansion valve (TXV) can be used on both heat pump and air conditioning applications. All TV's have a built-in check valve making them heat pump capable. All are externally equalized with non-adjustable superheat and are available with non-bleed construction. Hard start capability for outdoor units is required when non-bleed valve is used. The external equalizer line attached to the TXV has a female flare nut with built in **Schrader valve depressor** that attached to the Schrader valve port provided on most coils.

B. INSTALLATION NOTES

With reference to Figure 1, the TXV assembly is to be installed between the flowrator distributor and the existing liquid line attached to the flowrator distributor.

WARNING: COIL IS PRESSURIZED. RELIEVE PRESSURE BEFORE INSTALLING TXV BY DEPRESSING SCHRADER VALVE ON COIL MANIFOLD IF NITROGEN, OR RECLAIM REFRIGERANT IF COIL HAS HOLDING CHARGE.

C. INSTALLATION STEPS ARE AS FOLLOWS:

1. After coil pressure has been relieved, turn female swivel nut counter-clockwise to remove.
2. Remove the piston from the flowrator distributor fitting using a small diameter wire or paper clip (ALWAYS REMOVE THE PISTON FROM THE DISTRIBUTOR BODY WHEN TXV IS INSTALLED).
3. Attach the TXV by connecting the female swivel nut on TXV outlet to the flowrator distributor (aligning Teflon seal first) and torque swivel nut to 10 – 30 in. lb.
4. Attach liquid line with female swivel nut to male rotalock fitting on TXV inlet (aligning Teflon seal first) and torque swivel nut to 10 – 30 in. lb.

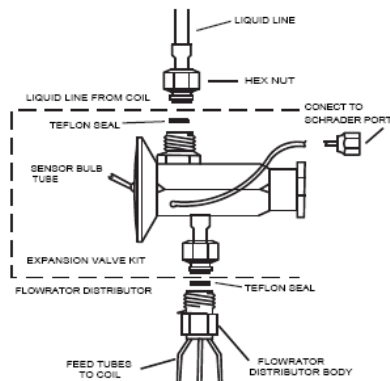
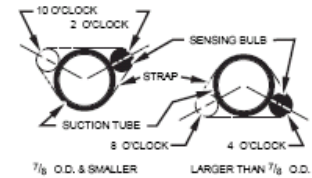


Figure 1

5. Remove the cap on Schrader valve port on coil manifold. Attach equalizer tubing with 1/4" female flare nut that includes depressor to this male Schrader port. Torque flare nut to 10 – 30 in. lb. **If using a different brand TXV, you must remove**

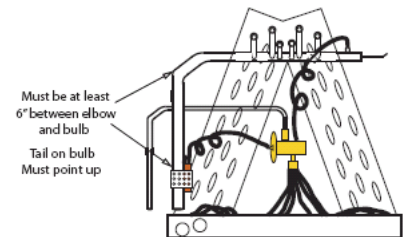
the Schrader valve core prior to attaching the equalizer tube.

6. Install the TXV bulb to the suction manifold of coil or the suction line using the two bulb clamps, or single large clamp, furnished with kit.
 - a. Bulb should be installed on a horizontal run of the manifold if possible. On line 7/8" OD and smaller the bulb should be installed at 2 or 10 o'clock. With line larger than 7/8" OD, the bulb should be installed in a position of about 4 or 8 o'clock.



Horizontal Bulb Locations

- b. If bulb installation is made on a vertical run, the bulb should be located at least 6 inches from any bend, and on the tubing side opposite the plane of the bend. On vertical bulb installations, the bulb should be positioned with bulb capillary tube at the top.
- c. The bulb should be insulated using thermal insulation to protect it from the effect of the surrounding ambient temperature.



Vertical Riser Application

7. After completing installation of TXV (including equalizer tube), it will be necessary to leak check the coil and evacuate the coil through the service access fittings of liquid and suction line valves. SEE COIL AND UNIT INSTALLATION INSTRUCTIONS.

TXV Troubleshooting

TXV sensing bulbs are not installed at the factory and should be installed in the field **after** the line set connections are made to prevent damage and bulb charge loss. Additionally, sensing bulbs installed on a vertical line should be installed "bulb up" so the capillary tubes is coming out the bottom of the bulb to help keep the gas in the bulb.

The correct operation of a TXV is depending on a number of variables, and any variables for the TXV misdiagnosis, in the order of occurrence, are:

1. Airflow (minimum of 350 cfm per 12,000 BTUH).
2. Correct sensing bulb location, with maximum contact with the suction line, and insulated from ambient condition. (Bulb should be located on the suction line close to the evaporator outlet at the 10 or 2 o'clock position and away from bends).
3. System refrigerant charge.

When charging a TXV system, the contractor should always use the sub-cooling method. This method accomplishes two things:

1. A liquid seal at the TXV which allows proper metering.
2. Reduce the potential of overcharging.

TO DETERMINE SUB-COOLING

1. Take the high side pressure and convert it to temperature using chart or gauge (Saturation Temperature).
2. Measure the temperature of the liquid line as close to condenser as possible. Must make good connection from sensor to line
3. Take the difference between the above readings. (Saturation temp [GAUGE] – Liquid line temp = Sub-Cooling).

NOTE: Liquid line refrigerant temperature should be within 7 - 10 degrees of the liquid line temp at condensing unit. If not, there could be restriction, over / under charged or line set is too long.

TXV are designed to maintain optimum Super Heat at the suction side of the evaporator coil. TXV system cannot be charged using the super heat method. However, super

heat can be used to determine if the TXV is working correctly, but that is also dependent on the air flow.

TO DETERMINE SUPERHEAT

1. Take the suction line temperature as close to the condensing section as possible; stay at least 6 inches from the compressor.
2. Take the low side pressure reading from gauges and convert it to temperature using chart or gauges (Saturation Temperature).
3. Take the difference between the above readings: (Suction line temp – Saturation temp = Super Heat).
4. When outside air temperature is 75-85 degrees the superheat should be 12-15 degrees, if the ambient temperature is 85 degrees or over the superheat should be 8-12 degrees.
5. If superheat is low, flooding of the evaporator is occurring.
6. If superheat is high then starving the evaporator is likely.
7. Do not adjust charge. Ensure airflow is correct and check charge using sub-cooling method.

FOR ADDITIONAL INFORMATION ON TXV OPERATION AND APPLICATION SEE SPORLAN BULLETIN 10-9 WHICH IS LOCATED:

<http://www.parker.com/literature/sporlan/sporlan%20pdf%20files/sporlan%20pdf%20010/10-9.pdf>

