MORTEX™
Manufactured Housing Products

INSTALLATION INSTRUCTIONS FOR MORTEX AIR CONDITIONING & HEAT PUMP INDOOR COILS

For Installation only in HUD manufactured homes per Construction Safety 24 CFR part 3280

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. Additionally, the cooling or heat pump systems to be installed in Manufactured Housing shall be certified, listed and rated based on U.S. 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.

Mortex coils are designed specifically for use with various models of manufactured housing gas or electric furnaces in both down-flow and up-flow applications. A different drain pan will be required on upflow oil furnaces.

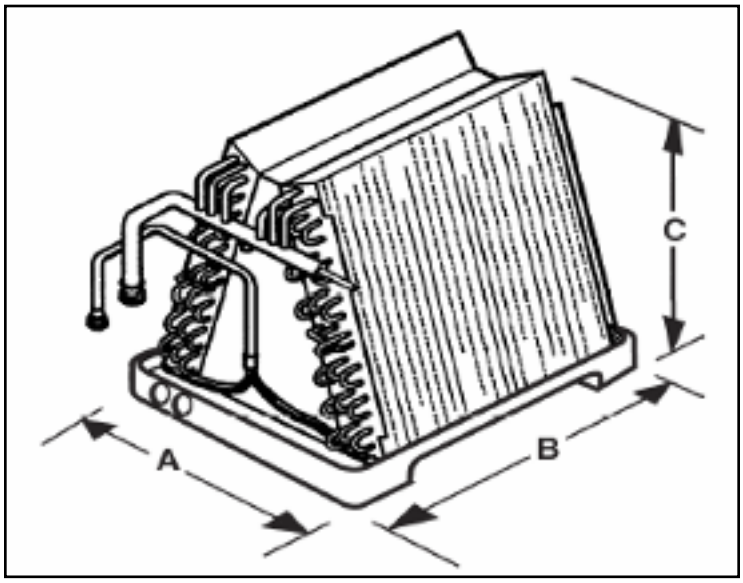
These instructions are intended to assist qualified individuals trained and experienced in the proper installation of heating and air conditioning equipment. Some state codes require installation and service personnel to be licensed. Refer to authorities having jurisdiction for additional guidance. The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

NOTE: Efficiency and capacity ratings are listed in the AHRI Unitary Directory (https://ahridirectory.org) under the indoor unit brand name Mortex for coil models matched with OEM outdoor condensing units or heat pump units. Air conditioning coils matches are listed under the Product Type of Residential/Air Conditioners and Air Conditioning Coils/AHRI Rating Conditions. Heat pump coil matches are listed under the Product Type of Residential/Heat Pumps/AHRI Rating Conditions. Incorrectly matched systems may not work properly and may void the manufacturers' warranties.

NOTE: Below is a partial listing of coils. Contact Mortex Products, Inc. with any questions.

Current Production Models

Model No.	Dimensions (inches)			Coil Wt. (lbs)	Pallet Qty.	Model No.	Dimensions (inches)			Coil Wt. (lbs)	Pallet Qty.
	A	B	C				A	B	C		
96-8Z3(*)-0P	18	19.625	16	30	20	98-8W6(*)-0P	18	19.625	22.5	47	12
96-8Z4(*)-0P	18	19.625	18	32	16	98-8W7(*)-0P	18	19.625	24.5	48	12
98-8Z6(*)-0P	18	19.625	22	34	12	98-8W8(*)-0P	18	19.625	26.5	50	8
98-8Z7(*)-0P	18	19.625	24	35	12	98-8W9(*)-0P	18	19.625	28.5	52	8
98-8Z9(*)-0P	18	19.625	28	37	8	98-8W11(*)-0P	18	19.625	32.5	56	8
96-8G2(*)-0P	18	19.625	14	30	20	98-8W12(*)-0P	18	19.625	34.5	58	8
96-8G3(*)-0P	18	19.625	16	31	20	96-R33(*)-0P	18	19.625	13	29	20
96-8G4(*)-0P	18	19.625	18	33	16	96-R34(*)-0P	18	19.625	14	30	20
97-8G5(*)-0P	18	19.625	20	34	16	96-R36(*)-0P	18	19.625	18	33	16
98-8G6(*)-0P	18	19.625	22	35	12	96-R38(*)-0P	18	19.625	21.5	36	16
98-8G7(*)-0P	18	19.625	24	36	12	96-R46(*)-0P	18	19.625	18	38	16
98-8G8(*)-0P	18	19.625	26	43	8	97-L46(*)-0P	18	20.5	18	40	16
98-8G9(*)-0P	18	19.625	28	46	8	98-R49(*)-0P	18	19.625	28	52	8
98-8G11(*)-0P	18	19.625	32	52	8	98-R28(*)-0P	18	19.625	21.5	36	8
98-8G12(*)-0P	18	19.625	34	52	8	96-851(*)-0P	18	19.625	12	29	20
96-893(*)-0P	18	19.625	16.5	36	20	96-852(*)-0P	18	19.625	14	30	20
96-8W4(*)-0P	18	19.625	18.5	38	16	96-853(*)-0P	18	19.625	16	32	20
97-8W5(*)-0P	18	19.625	20.5	45	16	(*) Designates Piston Size or TXV Application					



⚠ CAUTION

All sweat and quick connect coils are shipping from factory pressured with nitrogen and do not contain refrigerant. Relieve nitrogen pressure before opening the refrigerant circuit.

NOTE

Most Mortex coils are shipped from the factory with a TXV metering device. The TXV sensing bulb is not mounted due to potential heat damage and differences in bulb location in the field. After the suction and liquid line have been properly connected to the coil, the sensing bulb can be mounted on a horizontal section of the suction line if possible. Due to space limitations in some manufactured housing applications, the sensing bulb may have to be mounted on a vertical section of the suction line (See Figure C). If mounted vertically, the sensing bulb should be located at least 6" away from and bend (elbow) and on the opposite side from the plane of the bend (See Figure D). The sensing bulb should be insulated using the thermal insulation to isolate it from the effects of the surrounding ambient temperature.

Mortex coils and other accessories installed when air conditioning is added to manufactured housing furnaces must comply with HUD regulations requiring third party approvals. Certified efficiency and capacity ratings as required by HUD / DOE for Mortex coils matched to outdoor units are listed in the current AHRI directory under Summit Manufacturing. These certified ratings are based on air quantities consistent with those that are encountered in typical manufactured housing air conditioning and heat pump applications.

1. Pressure Check: All coils should be checked for pressure before leaving the distributor or begore installation! If no pressure is present, the coil may have developed a leak during shipment and should be returned to the point of purchase for exchange. For a quick connect coil, test for pressure by pushing against the diaphragm located inside the quick connect fitting on the suction manifold. If unable to depress the diaphragm, the coil contains a nitrogen holding charge.
   To test for pressure on a sweat connection coil, remove the cap or flare nut on the Schrader fitting located on the suction manifold and depress the valve core.
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 provide the rated airflow required to achieve the rated cooling capacity or upgrade the blower assembly to attain the proper airflow. Return air filters of generous size must be provided to prevent contaminating the coil, blower, and ductwork and to prevent restricting the airflow. Failure to deliver the proper airflow 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 superheat subcooling as recommended by outdoor unit manufacturers. Procedures will differ between manufacturers.
5. It is recommended that the coil be sprayed with a liquid detergent solution and rinsed thoroughly before installation to assure proper drainage of condensate from the coil fins, 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. Install the coil level or sloped slightly toward primary and secondary drain fittings. If mandated by code, connect both drain lines to an open drain, but never to a closed sewer. Pitch drain lines away from drain pan to assure proper drainage and test the drain lines with water before operating system. This step is mandatory in all manufactured housing installations. Reduction in size of the drain lines is not recommended and often not allowed.
7. A condensate trap installed in the drain lines is recommended for all installations, but is required for draw through installations where the coil is subjected to a negative air pressure to assure proper drainage of condensate from the coil drain pan. A condensate trap is especially important for installations with an electric heat furnace where improper drainage can result in a shock hazard.

ATTENTION!

An auxiliary drain pan must be installed under the coil and furnace for applications where the coil installed in an attic or above a finished ceiling. The auxiliary drain pan must have its own drain line (trap not required) draining into visible open drain (not a closed sewer) to alert the homeowner/user that the coil drain lines are plugged and need maintenance.

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 outdoor unit manufacturer.
9. Check all field installed refrigerant connections with an 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. Preventive maintenance on a heat pump indoor coil is critical to ensure proper airflow across the coils. Low airflow on indoor coils during winter months causes high head pressures and premature compressor damage due to oil breakdown. This problem is normally the result of a dirty air filter. The installer should instruct the homeowner of the importance of keeping filters clean.

INSTALLATION WITH ELECTRIC FURNACE

A typical electric furnace installation consists of a coil without a cabinet installed on top of a downflow furnace or a coil inside a cavity on either a downflow or upflow furnace.

The following Mortex installation kits are unique to manufactured housing air conditioning and are required to complete the installation.

1. Filter-Electrostatic (95-1741-UES) is required when using Mortex coil models on all electric furnaces without cavities. [See #3 below}
2 A Coil Support Bracket (99-3420-03) and coil support with Insulation Kit (99-3420-02) is required to support coils in Coleman furnaces.
3 .Coil & Filter Cabinets (97-BCC-02N) are recommended and may be required for Nordyne furnaces.

Installation Procedure

1. Turn off electrical power to the furnace by turning off breaker(s) in the home's main electrical panel and turning the furnace circuit breakers and any local disconnect switches to the OFF position.

   WARNING: Furnace may be connected to more than one electrical supply circuit. Do not use furnace disconnect only. Check power at furnace to verify electrical power is off.

2. Remove filter at top of furnace cabinet (Nordyne & Coleman only).
3. Remove refrigerant line knockout at top of furnace (Mortex & Nordyne only).
4. Install insulation if needed.
5. Attach drain pan gasket provided with coil to underside of coil drain pan and center coil on furnace (See Figure A).
7. Route low voltage wiring, refrigerant lines, and condensate drain lines through floor penetration.

   NOTE: If drain hose is below 40° F during installation warm before expanding and/or forming.
8. Form a 3" deep trap using field supplied tape and the provided flexible drain hose and connect hose to the condensate drain fitting on the coil drain pan with the provided clamp (See Figure B). The most efficient use of the drain hose is to form a "P" trap under the house.

   NOTE: All applications with a draw-through coil must have a condensate trap in the drain line due to the coil being operated in a negative air pressure.

9. Connect refrigerant lines per the line set instructions. Lubricate the quick connect threads with refrigeration oil for proper mating. Refer to outdoor unit installation instructions for additional information on line set hook-ups and proper torque values.
10. With the coil in place, seal off any openings at top or bottom of furnace with the provided silver backed tape to prevent air leakage or air bypass.
11. Install a return air filter.
12. Install any furnace or coil access panels that have been removed.
13. Restore electrical power to the furnace by turning the breaker(s) in the main electrical, furnace circuit breakers, and any local disconnect switches to the ON position.

INSTALLATION WITH GAS FURNACE

ATTENTION!

Do not install a coil containing refrigerant on a gas furnace that will be operated during the heating season without attaching the refrigerant lines to the coil. Possible coil damage will result from excessive pressure build up during heating operation.

A typical downflow gas furnace installation consists of a coil without a cabinet installed in the cavity of a downflow furnace. Coils with plastic drain pans are not suitable for upflow oil furnaces.

Installation Procedure

1. Turn off the electrical power to furnace.
2. Remove the lower front panel of the furnace and re-route any gas piping that is in front of coil compartment as required to install coil.

⚠ WARNING

Contractor must comply with all local, state, and federal codes and regulations when working with gas piping. Personal injury or death may result from improper installations!

3. Remove the coil cover panel(s).
4. Remove knockouts in the furnace for routing of refrigerant lines, low voltage wiring, and condensate drain.
5. Attach the provided drain pan gasket provided with the coil to underside of coil pan and center coil in coil cavity (See Figure A).
6. Connect the drain hose to the condensate fitting on the coil

drain pan and secure with the provided clamp (See Figure B).

7. Remove the knockouts from coil cover panel(s), cut the fiberglass insulation covering the openings, and reinstall the cover panel(s).
8. Seal any gaps in the interior panel door and around refrigerant lines with the provided silver backed tape.
9. Connect refrigerant lines and make sure all connections are tight and without leaks.
10. Reconnect the gas piping if it was disconnected and seal off any openings at bottom of furnace. National, state and local codes must be followed.
11. Install a return air filter if one is not already located in the furnace.
12. Replace front furnace door.
13. Turn on the gas and electrical supplies and perform a final system check.

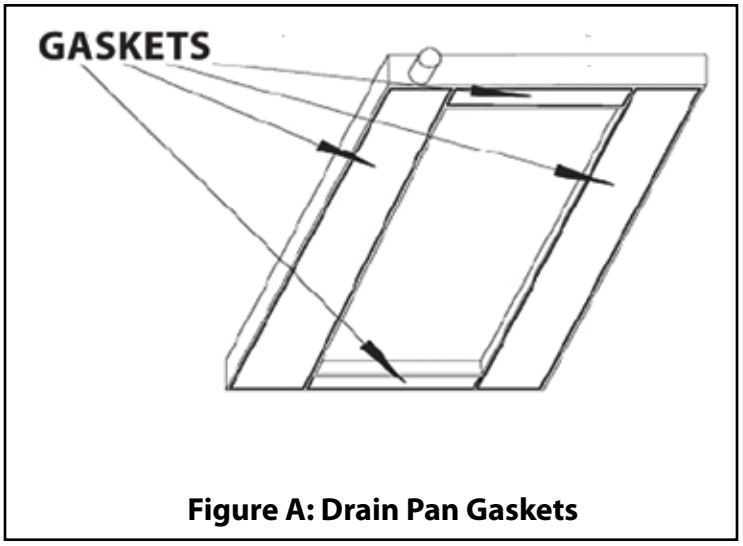
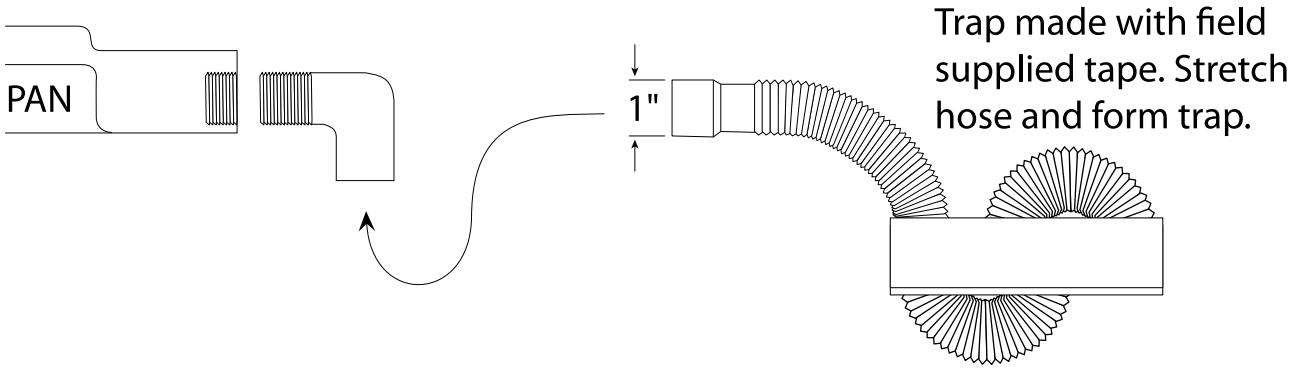


Figure A: Drain Pan Gaskets

Note: Review the following instructions before installing the coil in the furnace.

1. The accessory package to be used with a manufactured/mobile home plastic drain pan contains a 90º elbow that can be screwed into the left drain connections and turned down to exit the furnace.
2. Only hand tighten this fitting. Over tightening can result in cracks in the drain pan.
3. The enclosed drain hose will slip over the fitting or a standard PVC fitting can be used if code requires one.
4. The right drain connection is plugged to prevent flow unless a secondary drain is required.
5. A filed supplied straight fitting can be used for the auxiliary drain where required.
6. Remove auxiliary drain plug, insert fitting, and turn down using a standard 3/4" PVC elbow.
7. Installation of a collapsible hose the main and auxiliary condensate drain connections is required as show below.



8. Slip 1" ID section of hose onto the 90º drain fitting.
9. The hose may be very tight, but it will stretch as it is slipped onto the fitting.
10. The drain hose can be in place during installation if the clamps are securely fastened.
11. If the drain hose must be removed to complete the installation, make sure the hose is reattached and securely fastened with the clamps before completing the installation.

Figure B: Condensate Drain Hose and Trap

SPECIAL CONSIDERATIONS FOR SELECTING HEAT PUMP COILS

The selection of indoor coils for heat pump outdoor units is much more critical than the selection of indoor coils for straight air conditioning units. The differences are as follows:

1. Only indoor coils with flow control devices with a check valve may be used with outdoor heat pump units. These devices permit reverse refrigerant flow in the coils when the system is operating in the heating mode. All Mortex TXV's and piston restrictors have a built-in check valve making them heat pump capable when matched with the proper AHRI rated outdoor unit.

   NOTE: Cap tube or non-check valve piston metering device coils must not be used in heat pump applications.
2. Matching of indoor coils for heat pumps demands that the heat rejection capacity, internal volume, and equivalent metering device of the matched coil be equivalent to that of the smallest internal volume coil the outdoor unit manufacturer recommends for that outdoor unit.
3. It is important that selection be based on Mortex's recommendation for the specific coil, metering device, and outdoor heat pump unit of a specific make, series, and model number.

4. Failure to comply with the proper selection requirements will affect efficiency, charging, and reliability and may result in damage to the system or system components.
5. The matching of specific indoor heat pump coils with specific outdoor heat pump units as certified in the heat pump section of the current AHRI Directory will assure proper and efficient operation of heat pump systems (See https://.ahridirectory.org).

SPECIAL INSTRUCTIONS FOR CHARGING HEAT PUMP COILS

Specific instructions for refrigerant charging of a heat pump system as recommended by the outdoor unit manufacturer should be followed. These instructions will vary from different manufacturers, but in general are as follows:

1. For a TXV in the indoor coil, use the liquid subcooling method in the cooling mode. Measure the following values in the system: liquid line pressure and temperature at the outdoor unit liquid service valve. Compare measurements to a refrigerant temperature/pressure chart to determine the liquid subcooling. Adjust the refrigerant charge to achieve outdoor unit manufacturer's recommended liquid subcooling level.
2. For a piston metering device in the indoor coil, use the suction superheat method in the cooling mode. Measure following values in the system: Suction line pressure and temperature at the outdoor unit suction service valve. Compare measurements to a refrigerant temperature/pressure chart to determine the suction superheat. Adjust the refrigerant charge to achieve outdoor unit manufacturer's recommended suction superheat level.
3. If problems using the outdoor manufacturers suggested charging method are encountered, the technician should contact the outdoor unit manufacturer for assistance.

METERING DEVICE INSTRUCTIONS FOR TXV & PISTON COILS

All Mortex TXV's have a built-in check for heat pump applications and can be used on both A/C and heat pump applications. Mortex coils are shipped with one of the following R-410A TXV's depending on the capacity.

- 72DB0053 - Operational range of 1.5 - 2.5 Tons
- 72DB0054 - Operational range of 3.0 - 5.0 Tons

Mortex coils are shipped from the factory with the TXV mounted on the distributor body, but the sensing bulb is shipped unattached to allow the suction line to be brazed to the coil suction stub without the heat from the torch damaging the TXV. If possible, the sensing bulb should be installed on the horizontal run of the suction line if as shown in Figure C. The sensing bulb clamp must be tightened sufficiently to provide good contact between the sensing bulb and the copper suction line.

If the sensing bulb must be mounted on a vertical section of the suction line, the sensing bulb should be located at least 6 inches from any bend and mounted on the side of the line opposite the plane of the bend and the sensing bulb should be positioned with the capillary tube at the top (See Figure D). The bulb should be insulated using thermal insulation to protect it from the effect of the surrounding ambient temperature.

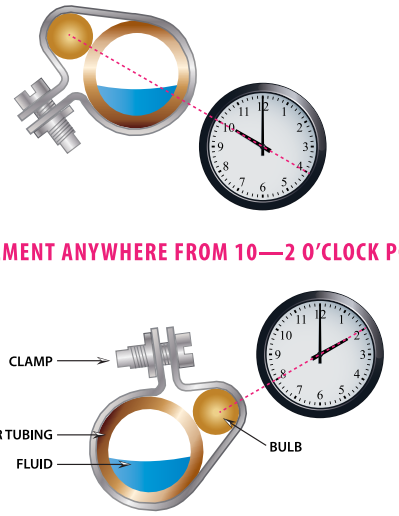


Figure C: TXV Sensing Bulb Mounted on Horizontal Section of Suction Line

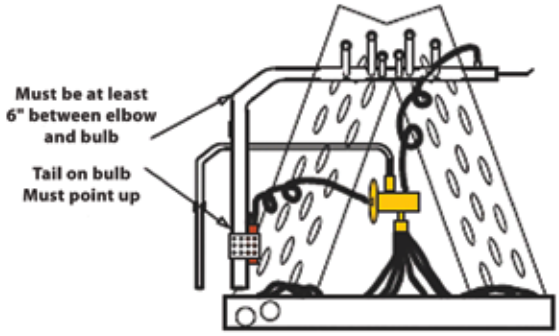


Figure D: TXV Sensing Bulb Mounted on Vertical Section of Suction Line

Mortex coils have a Chatleff type distributor body that accepts a screw-on TXV or Chatleff style piston. All metering devices, both TXV's and pistons, have a direct relationship to the specific outdoor unit the coil is matched with. Refer to the AHRI Directory (www.ahridirectory.org) listing for the specific coil and outdoor unit match-up to determine if a piston or TXV is required to attain the AHRI rated capacity and efficiency. Refer to the outdoor unit manufacturer's instructions to determine the correct piston size if a piston coil is installed. As a general rule of thumb, the R-410A piston sizes are shown in the chart below.

Tonnage	Nominal Piston Size
1.5	.049 - .053
2.0	.055 - .057
2.5	.061 - .063
3.0	.067 - .070
3.5	.073 - .076
4.0	.078 - .080
5.0	.086 - .088

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