

GENERAL INFORMATION

This manual contains instructions for the installation, operation and maintenance of the Hydronic Air Handler. Some models are equipped with heating only coils. Read it carefully before using the air handler. Then keep it handy for quick future reference by inserting it in the plastic envelope provided on the appliance.

Rating Plate

A rating plate identifying the air handler will be found inside the front access panel. A rating plate identifying the water heater will be found above or to the left of the gas control valve. When referring to the air handler and/or water heater, always have the information listed on the rating plate readily available.

Customer Responsibilities

Please take the time to read not only this manual but also the warranty sheet enclosed. Warranty of parts and the air handler will depend on the proper installation, maintenance and operation of the air handler. Furthermore, the warranty shall be void if the design or structure of the air handler is, or is attempted to be, modified or altered in any way, including, but not limited to, by attaching non-Company approved appliances or equipment.

The manufacturer of this air handler will not be liable for any damages because of failure to comply with the installation and

operating instructions outlined on the following pages. Use them as a guide to check the propriety of the air handler installation.

You will need to maintain the air handler and water heater as outlined in their respective manuals.

Equipment in this carton was inspected and verified to be in good condition at the time it left the factory. When received, a visual inspection of the equipment should be made and any damage noted on the delivery receipt. A damage claim should be filed immediately with the carrier.

ALL TECHNICAL AND WARRANTY QUESTIONS SHOULD BE DIRECTED TO THE LOCAL DEALER FROM WHOM THE AIR HANDLER WAS PURCHASED. IF YOU ARE UNSUCCESSFUL, PLEASE WRITE TO APOLLO HYDROHEAT AND COOLING AT THE ADDRESS LISTED BELOW.

Repair Parts

For service or repair parts contact:

- First:** The Installing Contractor
- Second:** The local Distributor
- Third:** Apollo HydroHeat and Cooling
500 Lindahl Parkway
Ashland City, TN 37015
www.apollohydroheat.com

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HOW THE SYSTEM WORKS

This section will answer many of the most often asked questions about the system.

How does it Work?

The heating system uses a gas water heater to furnish heat to the space of a residence, as well as its domestic hot water. A simple recirculating loop of hot water is tapped off near the top of the heater and is circulated through a finned tube heat exchanger in an air handler or duct coil that furnishes warmed air to the space. The cooled water (140°F cooled to about 120°F) is then returned to the water heater, near the bottom of the tank. Apollo air handlers equipped with circulating pumps are fully factory piped and wired.

The water heater may include side tapplings to provide the recirculating loop connections. When a conventional heater is used, special fittings including check valves are used at the hot and cold water connections.

The control of the heating system is very simple. A conventional heating or heating/cooling thermostat is used. On a call for heat, the hot water circulator is energized through a relay, as is the blower motor. Hot water immediately begins circulating through

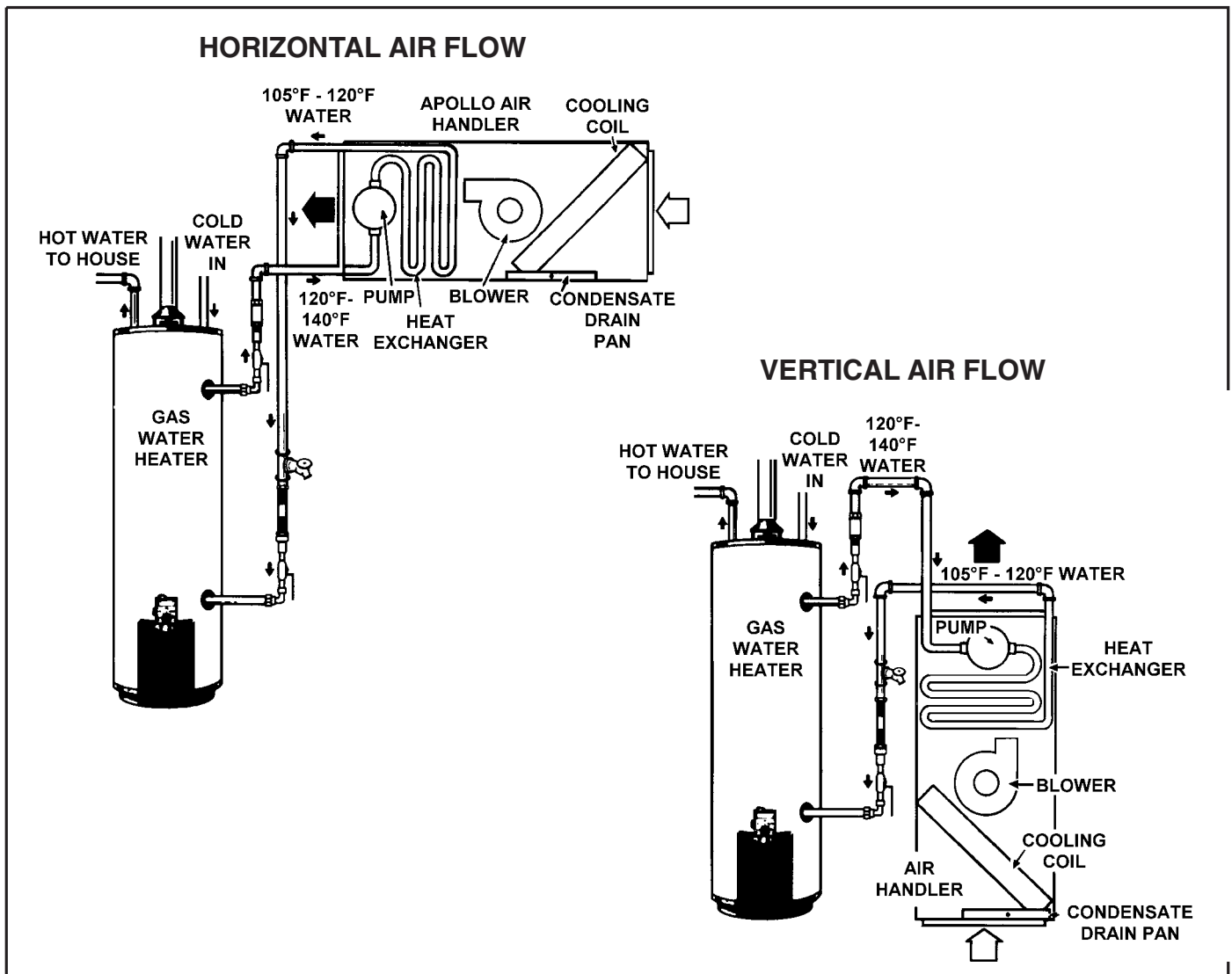
the heat exchanger, and heats the air. Typical outlet air temperatures are 95°F - 105°F. When the thermostat is satisfied, the pump and blower both stop.

How is the HydroHeat System sized?

Proper sizing of the water heater is essential, and begins with the ACCA Manual J design heat loss of the structure to be heated. The heating capacity of the air handler selected must be equal to or larger than the design heat loss. Then, the water heater selected must have a heat output equal to or greater than the coil or air handler heating capacity.

Does a HydroHeat System Require a Larger Tank Size?

In general, it does not require a larger tank size to furnish space heat as well as domestic water. When proper calculation has been made to determine the BTUH input required, and the heater has been selected on that basis, the tank size must be no smaller than 40 gallons, and should be at least that normally used for the expected occupancy of the home.



SAFETY

DANGER

HOTTER WATER CAN SCALD: Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy space heating, clothes washing, dish washing, and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/mentally handicapped. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a certain temperature water at the hot water tap, then you must take special precautions. In addition to using the lowest possible temperature setting that satisfies your hot water needs, some type of tempering device,

such as a mixing valve, should be used at the hot water taps used by these people or at the water heater. Mixing valves are available at plumbing supply or hardware stores. Follow manufacturers instructions for installation of the valves. Before changing the factory setting on the thermostat, read the "Temperature Regulation" section in this manual.

WARNING

Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system which has been under water.

PREPARING FOR THE NEW INSTALLATION

NOTE: Information in this section is generic. Refer to "Setting Equipment" section of this manual for specific models.

Location

There may be up to 70' of separation between the air handler and the water heater. The location selected for the water heater should be as close to the stack or chimney as practical, and as centralized with the piping system for the air handler as possible. They (air handler/water heater) should be located in an area protected from the elements.

In installations in areas that may experience freezing temperatures, care should be taken to protect equipment from freezing, and dwelling from water damage, should freezing occur.

NOTE: The locations selected should provide adequate clearances for serving and proper operation of the air handler.

CAUTION

This hydronic air handler as all hydronic handlers will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

Water heater life depends upon water quality, water pressure and the environment in which the water heater is installed. Water heaters are sometimes installed in locations where leakage may result in property damage, even with the use of a drain pan piped to a drain. However, unanticipated damage can be reduced or prevented by a leak detector or water shut-off device used in conjunction with a piped drain pan. These devices are available from some plumbing supply wholesalers and retailers, and detect and react to leakage in various ways:

- Sensors mounted in the drain pan that trigger an alarm or turn off the incoming water to the water heater when leakage is detected.
- Sensors mounted in the drain pan that turn off the water

supply to the entire home when water is detected in the drain pan.

- Water supply shut-off devices that activate based on the water pressure differential between the cold water and hot water pipes connected to the water heater.
- Devices that will turn off the gas supply to a gas water heater while at the same time shutting off its water supply.

Clearance to Combustible Materials

The air handler can be operated with 0" of clearance to combustible materials from any side, front or back. Discharge clearance is also 0".

NOTE: For water heater clearances see instruction manual that was included with the water heater.

NOTE: When these units are installed without return air ducts, applicable installation codes may restrict their installation to a single story residence.

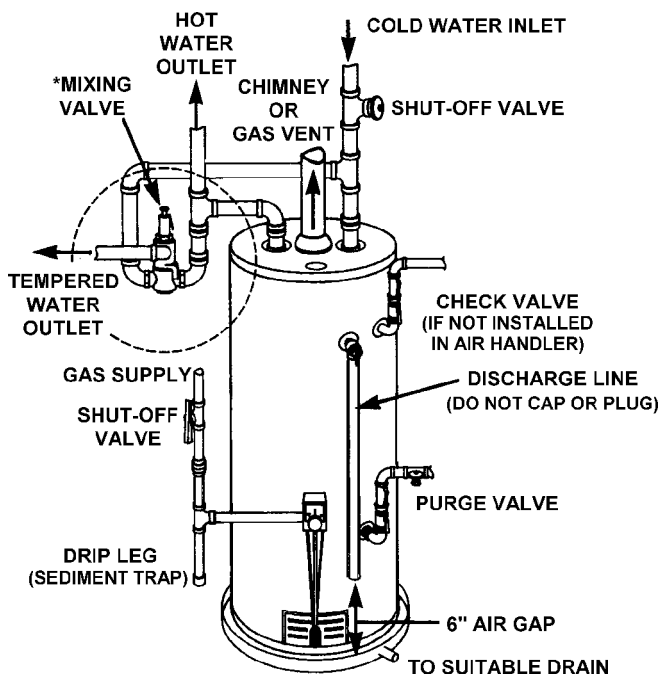
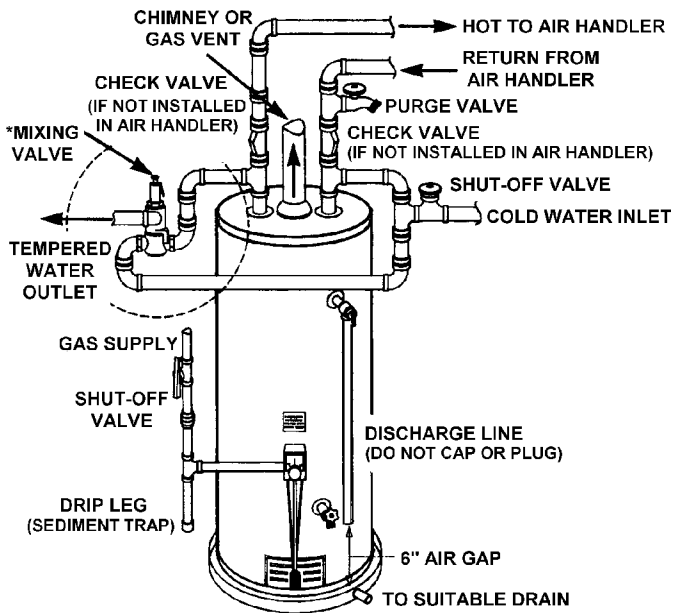
Typical Installations

NOTE: Typical installation drawings are generic. Air handler and water heater styles vary by model. Refer to "Setting Equipment" of this manual for specific models.

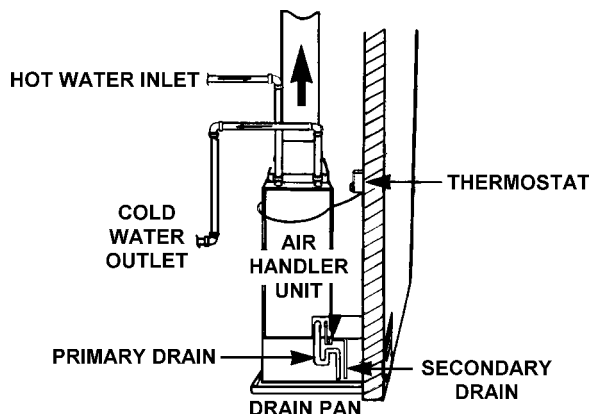
Specifications subject to change without notice. Installation of this product must comply with prevailing building, safety and National Electric Code. Codes and should be in accordance with manufacturer's instructions.

Water heaters used for space heating must be listed and labeled as "suitable for (potable) water heating and space heating".

Water heaters used for space heating must also be used for domestic (potable) water heating.

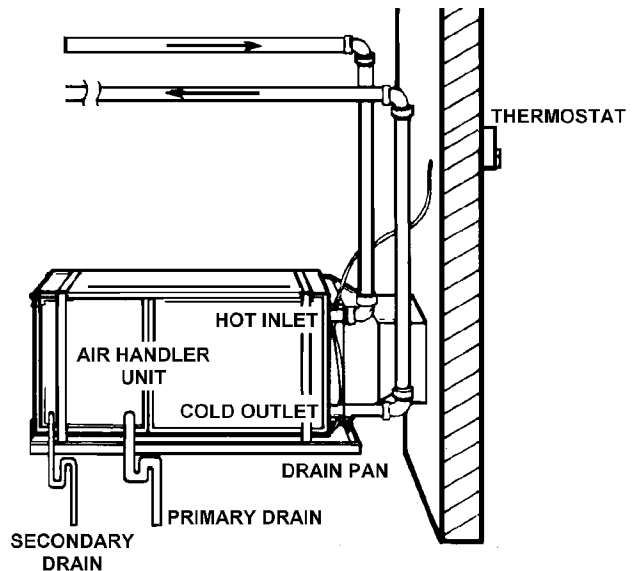


NOTE: If the air handler is equipped with an internal check valve, do not install a check valve in the supply line to the air handler.



⚠ DANGER

When the system requires water at temperatures higher than required for other uses, the hot water system may require a means such as mixing valves to be installed to temper the water at certain points of use. Some people are more likely to be permanently injured by hot water than others; these include the elderly, children, the infirm, or the physically/mentally handicapped. Before immersing yourself or anyone else in hot water, be sure to check the water temperature. **WARNING: HOTTER WATER INCREASES THE RISK OF SCALD INJURY.** (Also see "Temperature Regulation" section in water heater manual). Mixing valves are available at plumbing supply or hardware stores. Follow manufacturer's instructions for installation of these valves.



Installation Notes

NOTE: Installation notes are generic. Air handler and water heater styles vary by model.

Conventional Water Heater Supplying a Single Air Handling Unit

1. Total piping footage should not exceed 140 feet.
2. All piping should be 3/4" copper or approved plastic. **NOTE:** Acetal plastic fittings should not be used in recirculating hot water systems. Use only brass or copper fittings.
3. A depneumatic fitting is not supplied. This device must be installed when there is greater than an 8 foot change in elevation between the top of the air handler and top of the water heater.

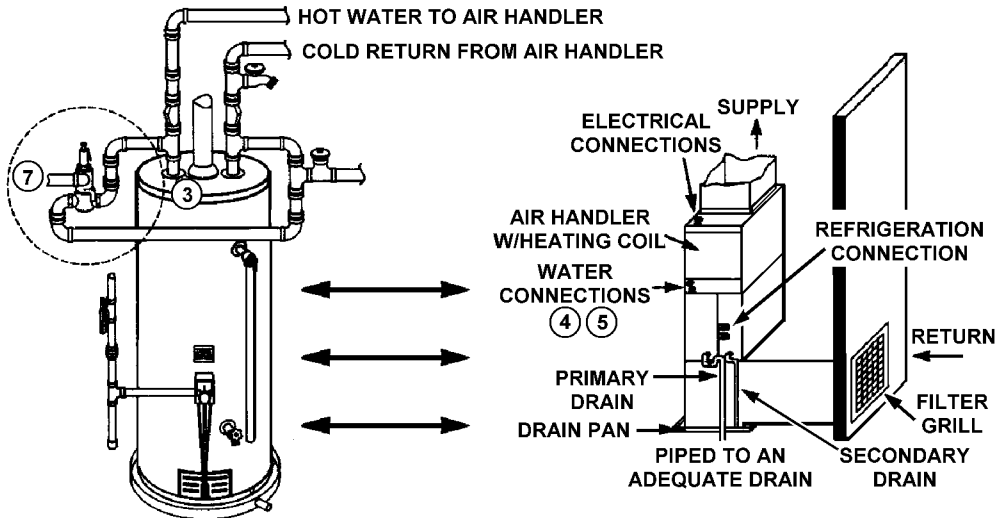
NOTE: Water heaters that have an anode rod or another fitting in the hot outlet cannot be used. The depneumatic fitting will not work on these models. **NOTE:** The depneumatic fitting with supply line and return line check valves is available as a kit (Accessory 9001309).

Install the depneumatic fitting into the hot outlet fitting of the water heater.

Out of the top of the depneumatic fitting run a 3/4" pipe of copper or approved plastic to the inlet fitting on the air handler. The tapping in the side of the depneumatic fitting is the domestic hot supply and should be piped to the hot supply line.

The cold side piping should be done as shown in the diagram.

4. Heating unit supply connection labeled "Hot Inlet Supply from Water Heater".



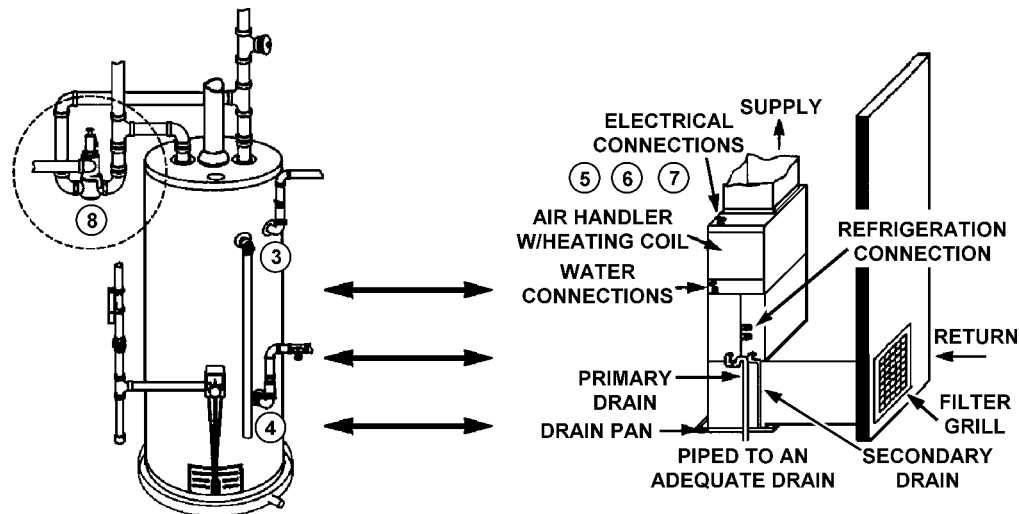
5. Heating unit return connection labeled "Cold Outlet Return to Water Heater".
6. Because inlet and outlet positions are different on each model, refer to labeling on the cabinet.

⚠ DANGER

7. When the system requires water at temperatures higher than required for other uses, the hot water system may require that a means such as a mixing valve be installed to temper the water at certain points of use.

Circulating Loop Water Heater Supplying a Single Air Handling Unit.

1. Total piping footage should not exceed 140 feet.
2. All piping should be 3/4" copper or approved plastic (**NOTE:** Acetal plastic fittings should not be used in recirculating hot water systems. Use only brass or copper fittings.)
3. Hot supply tapping labeled "Hot (Outlet) Recirculating Loop Connection".
4. Cold return tapping labeled "Cold (Return) Recirculating Loop Connection".



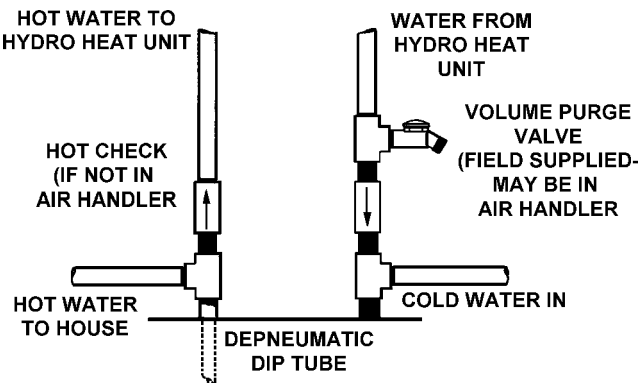
5. Heating unit return connection labeled "Hot Inlet - Supply from Water Heater".
6. Heating unit return connection labeled "Cold Outlet - Return to Water Heater".
7. Because inlet and outlet positions are different in each model, refer to labeling on back of cabinet.

⚠ DANGER

8. When the system requires water at temperatures higher than required for other uses, the hot water system may require that a means such as a mixing valve be installed to temper the water at certain points of use.

Depneumatic Fitting Kit (Part No. 9001309)

A depneumatic fitting should be used if this unit is installed with any water heater other than a side connection circulating loop water heater. They must be installed in the water heater as shown.



Water Piping

This air handler is intended for use with pressurized potable hot water sources with the rated maximum entering water temperature on the air handling unit. For systems using oil or gas-fired domestic water heaters as a hot water source, pipe as shown in the diagram on page 3. The system should be installed only with new piping that is suitable for potable water, such as copper or approved plastic. Do not use with PVC piping. All piping should be done in 3/4" with a maximum total piping footage of 140 feet. The unit has 1/2" I.D. copper water connections, therefore, a 3/4" x 1/2" adapter is required. The cabinet finish should be shielded from the torch flame during soldering. Piping run through unconditioned areas should be insulated to prevent freezing and minimize heat loss.

⚠ DANGER

When the system requires water at temperatures higher than required for other uses, the hot water system may require a means such as a mixing valve to be installed to temper the water at certain points of use. Some people are more likely to be permanently injured by hot water than others; these include the elderly, children, the infirm, or the physically/mentally handicapped. Before immersing yourself or anyone else in hot water, be sure to check the water temperature. **WARNING: HOTTER WATER INCREASES THE RISK OF SCALD INJURY.** (Also see "Temperature Regulation" section in water heater manual). Mixing valves are available at plumbing supply or hardware stores. Follow manufacturer's instructions for installation of these valves.

⚠ WARNING

Toxic chemicals such as used for treatment of boilers or non-potable water heating appliances shall never be introduced into a potable water space heating system.

Pipes and fittings should be installed in compliance with the installation drawing and all applicable local codes. Have the installer show you where the water shut-off valve for the water heater is installed so that you know where and how to shut the water off. It is recommended that such a valve be located in close proximity to the water heater. See installation drawings on page 3. To insure complete filling of system, follow "System Start Up Procedure" section 10.

⚠ CAUTION

After system has been checked, do not allow it to be drained or shut off if there is a possibility of freezing. See "System Shutdown" section.

⚠ CAUTION

Operating an empty or partially filled system will result in damage.

If a system (air handler/water heater) is installed in a closed and/or high pressure water system; such as one having a back flow preventer, check valve or water meter with check valve in the cold water supply line, means shall be provided to control thermal expansion. Contact the water supplier or local plumbing contractor on how to control this situation.

Water Pressure

The water supply system incorporates the air handler and water heater and conditions created in the water supply system and effected by the water heater also involve the air handler.

Water supply systems may, because of high line pressure frequent cut-offs, the effects of water hammer and others, have installed devices such as pressure reducing valves, check valves, back flow preventers, etc. . . to control these types of problems. When these devices are not equipped with an internal by-pass, and no other measures are taken, they (the devices) cause the water system to be closed. As water is heated, it expands (thermal expansion) and closed systems do not allow for the expansion of heated water.

The water within the water heater tank expands as it is heated and increases the pressure of the water system. If the relieving point to the water heater's temperature-pressure relief valve is reached, it (the T & P valve) will relieve the excess pressure. This is an unacceptable condition and must be corrected.

It is recommended that any devices installed which could create a closed system, have a by-pass and/or the system have an expansion device tank to relieve the pressure built by thermal expansion in the water system. Contact the local water supplier and/or plumbing contractor for assistance in controlling these situations.

Discharge Ducting

This unit has its blower discharging directly into the supply duct system resulting in high velocities close to the end of the unit. To insure efficient air flow the supply plenum attached to this unit should be a minimum of three feet long. Also outlet runs should tap into this duct as far from the end of the unit as possible. Avoid registers within line of sight of the blower outlet.

Return Ducting

Air velocity in return should be as low as practical. 400 feet per minute or less is good design. Filters should not exceed 400 feet per minute air velocity.

Optional Air Filters

Air handlers may or may not be factory equipped with an air filter. Many times a filter will not be installed because the return grill has its own filter. In these cases a filter installed in the air handler is not recommended. By referring to the repair parts chart, the location can be established. Removing the access panel will gain access to the filter. It should be checked periodically and replaced if necessary. The filter is a standard item that can be obtained locally.

Condensate Drain

The internal air handler drain pan is supplied to remove normal condensation. The primary drain connection is 3/4" N.P.T. and the secondary drain connection may be 5/8" O.D. copper or 3/4" N.P.T. Piping from the primary drain connection should have a 1 1/2" minimum trap and should be run in such a manner as to provide enough slope for adequate drainage. The secondary drain connection is for an overflow drain. When required, it should be run to an area where any discharge would be visible. Do not pipe these two fittings together into a common drain. When horizontal run exceeds 15 feet, a vent tee may be necessary to go between the unit and the trap to insure proper drainage. The condensate drainage system should be tested by pouring water into the unit drain pan prior to operation of the unit.

Refrigerant Piping

Units equipped with evaporators will require liquid and insulated suction piping sized in accordance with the condensing unit manufacturer's recommendations. The evaporator coils are fitted with copper stubs to which the refrigerant line should be soldered. Use silver solder or other high temperature brazing alloy intended for refrigeration work. The stubs are located close to the side of the cabinet so it is a good idea to protect the cabinet insulation

Wiring Diagrams

from flame damage with a small piece of sheet metal. Also, the manufacturer recommends that the refrigerant lines are filled with dry nitrogen before soldering. This will minimize the formation of ash inside the lines that can clog the capillary strainer or orifice metering device.

Low Voltage Wiring

Connections of the low voltage thermostat and condenser control are to be made to the low voltage harness exposed on the outside of the cabinet. When splicing these wires, the use of insulated butt splices instead of wire nuts will yield a neater, more reliable connection.

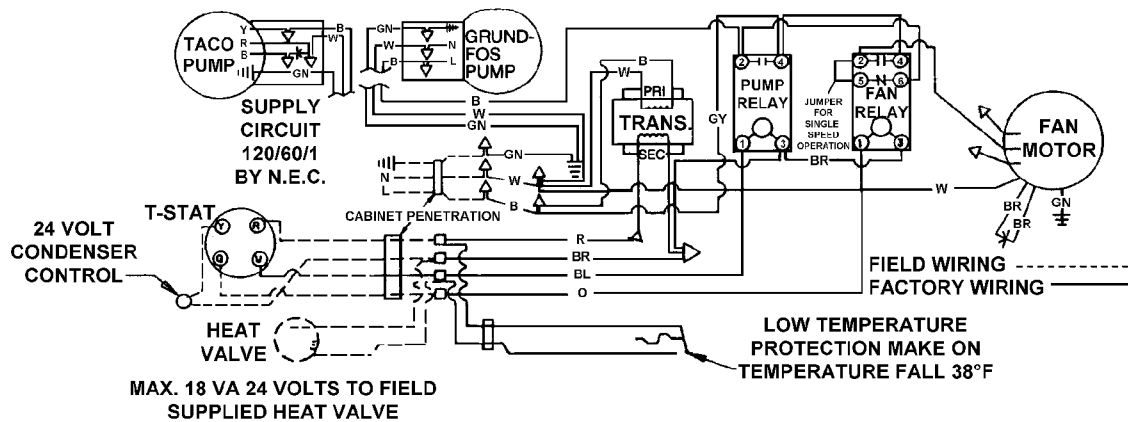
Make low voltage connections to thermostats and condensing units as shown in the wiring diagrams. Conventional heat/cool or heating only thermostats will work satisfactorily.

Line Voltage Wiring

Line voltage wiring should be done in compliance with all national and local codes. A 7/8" hole located in the unit provides access to the line voltage lead wires. Wire incoming power as described on the schematic below.

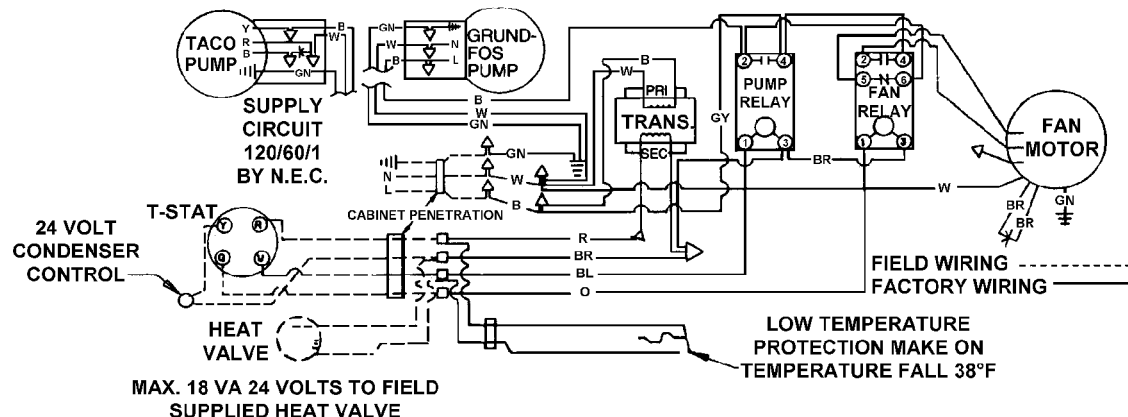
SINGLE SPEED OPERATION

NOTE: USE THERMOSTAT WITH ISOLATING CONTACTS TO PREVENT INTERCONNECTION OF CLASS 2 CIRCUITS.



TWO SPEED OPERATION

NOTE: USE THERMOSTAT WITH ISOLATING CONTACTS TO PREVENT INTERCONNECTION OF CLASS 2 CIRCUITS.



LEGEND

B = BLACK
 BL = BLUE
 BR = BROWN
 GND = GROUND
 GN = GREEN
 GY = GRAY
 L = LINE
 N = NEUTRAL
 O = ORANGE
 R = RED
 W = WHITE
 Y = YELLOW

FAN SPEED

B = HIGH
 BL = MEDIUM
 R = LOW

Charging by Superheat

Charging by superheat is the most precise method of getting the optimum refrigerant charge in an air conditioning system. This method best matches the system's ability to absorb heat, with the available heat load on the evaporator. Superheat charging can be used on any air conditioning unit with cap tube or fixed orifice liquid control when charging is done in ambient temperatures above 60°F. Superheat in this type of system will vary with change of conditions of air over the condenser and evaporator. The amount of superheat at the compressor must be adjusted to meet these conditions.

Measuring Superheat

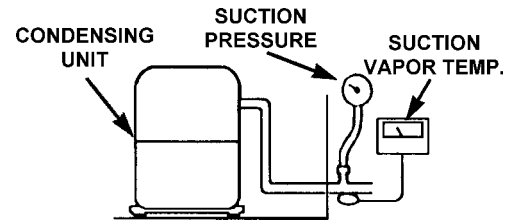
1. Make sure evaporator coil has rated CFM of air flow.
2. Install accurate refrigerant pressure gauge to suction service valve gauge port or fitting at the condensing unit.
3. Attach an accurate thermometer to the bottom side of suction line as close to gauge port as possible. Make sure thermometer is in good thermal contact with suction line. Insulate the thermostat and suction line against effects of ambient air temperature.
4. With unit operating, measure condenser inlet air dry bulb temperature and evaporator inlet air wet bulb temperature.
5. Using the Superheat Table, find proper superheat at the intersection of these two temperatures.
6. Measure suction pressure. Using Pressure Temperature Chart, find evaporator saturated suction temperature for this pressure.
7. Measure suction line temperature at condensing unit.
8. The difference between suction line temperature and saturated temperature is the amount of superheat.
9. If superheat is too high - refrigerant must be added. If superheat is too low - refrigerant must be removed.

⚠ CAUTION

Wait at least 5 minutes after adding or removing refrigerant from system before attempting to re-measure superheat.

SUPERHEAT TABLE

CONDENSER AIR INLET TEMP. -°F - D.B.	EVAPORATOR AIR INLET TEMP. - °F - W.B.											
	54	56	58	60	62	64	66	68	70	72	74	76
60	13	17	18	20	24	26	28	30				
65	11	13	17	17	18	22	25	28	30			
70	8	11	12	14	16	18	22	25	28	30		
75		7	10	12	14	16	18	23	26	28	30	
80			6	8	12	14	16	18	23	27	28	30
85				6	8	12	14	17	20	25	27	28
90					6	9	12	15	18	22	25	28
95						7	11	13	16	20	23	27
100							8	11	14	18	20	25
105							6	8	12	15	19	24
110								7	11	14	18	23
115									8	13	16	21



Example of Checking System Charge by Superheat

Assume condenser air inlet D.B. to be 90°F and evaporator air inlet W.B. to be 68°F. From the Superheat Table we find the correct superheat for these conditions to be 15 degrees.

The suction pressure at the time is 60 PSIG and suction line temperature is 55 degrees. Using Pressure Temperature chart we find that for a 60 PSIG suction pressure - the evaporator saturation temperature will be 34 degrees.

The difference between suction line temperature and saturation temperature is the amount of superheat.

Suction line temperature	55°F
- Suction pressure @ 60 PSIG	34°F Saturation
= Superheat	21°F

The 21°F superheat is higher than the required 15°F. The system is undercharged. As we add refrigerant, the suction pressure will rise causing saturation temperature to rise. At the same time, suction vapor temperature will fall. In other words the two temperatures will come closer together as refrigerant is added.

⚠ CAUTION

If during charging time, indoor W.B. changes more than 2°F or outdoor ambient more than 3°F, check Superheat Table for new superheat and charge to this superheat.

Proper Superheat Assures Proper System Capacity and Efficiency.

PRESSURE TEMPERATURE CHART - R22

SUCTION PRESSURE PSIG	SATURATED SUCTION TEMP. °F
54.9	30
57.5	32
60.1	34
62.8	36
65.6	38
68.5	40
71.5	42
74.5	44
77.6	46
80.8	48
84.0	50
87.4	52
90.8	54
94.3	56
97.9	58
101.6	60

System Start Up Procedures

NOTE: Heating system should not be switched on until system filled and pumps vented.

1. Fill and pressurize the water heater and air handler.
2. The water heater should be started. At this time it will take approximately 45 minutes for it to come up to temperature. Lighting instructions will be found on the rating plate attached to the water heater.
3. Vent air from the water tank by opening a hot water spigot.
4. Vent and flush the supply and return lines by opening the installed volume purge valve in the air handler or a field installed purge valve on the return line of the heating loop. Run approximately 5 gallons of water at a high flow rate to purge.
5. Energize the unit by switching on the line voltage source and the thermostat. The fan and pump should start simultaneously. The water coil should become warm, and after a few minutes of operation, any churning noise in the pump should subside. It may be necessary to unwire the fan motor to listen for pump operation. Properly operating pumps are nearly silent in operation.

Water Heater Temperature Adjustment

The water temperature dial of the water heater is set at the lowest position during manufacture and must be turned to the desired setting by the user. The faceplate of the gas control has been labeled with a range of temperature settings.

Due to the nature of the typical gas water heater the water temperature in certain situations may vary up to 30°F higher or lower at the point of use such as, bathtubs, showers, sinks, etc.

DANGER

When the system requires water temperatures higher than required for other uses, the hot water system may require that a means such as a mixing valve be installed to temper the water at certain points of use.

DANGER

HOTTER WATER CAN SCALD: Water heaters are intended to produce hot water. Water heated to a temperature which will satisfy space heating, clothes washing, dish washing, and other sanitizing needs can scald and permanently injure you upon contact. Some people are more likely to be permanently injured by hot water than others. These include the elderly, children, the infirm, or physically/mentally handicapped. If anyone using hot water in your home fits into one of these groups or if there is a local code or state law requiring a certain temperature water at the hot water tap, then you must take special precautions. In

addition to using the lowest possible temperature setting that satisfies your hot water needs, some type of tempering device, such as a mixing valve, should be used at the hot water taps used by these people or at the water heater. Mixing valves are available at plumbing supply or hardware stores. Follow manufacturers instructions for installation of the valves. Before changing the factory setting on the thermostat, read the "Temperature Regulation" section in this manual.

DANGER

Never allow small children to use a hot water tap, or to draw their own bath water. Never leave a child or handicapped person unattended in a bathtub or shower.

Common safety practices, American National Standards, and various state and local laws demand that warnings of scald hazard from water temperatures in excess of 120°F be given to users.

In dual use (water heating/space heating), higher temperatures may be necessary for the space heating requirement. In such cases, the use of a tempering device such as a mixing valve is recommended as indicated in the warning on page 5.

NOTE: For complete details concerning temperature adjustment of the water heater gas control valve, refer to the water heater installation instruction manual and the rating plate attached to the water heater.

System Shutdown

The system should not be shutdown during times of freezing temperatures. Leave the gas control valve at its lowest setting and the air handler's thermostat left on heat setting. If the water heater and air handler must be shut down for extended periods, a qualified service agent needs to be used to insure the air handler and piping are drained of all water.

CAUTION

Periodic draining and cleaning of sediment from the water heater tank may be necessary.

1. Turn the gas control knob to the "OFF" position.
2. Turn the air handler thermostat off.
3. Close the cold water inlet valve to the water heater.
4. Open a nearby hot water faucet.
5. Open the water heater drain valve.
6. Perform cleaning procedure as necessary.

DANGER

The water passing out of the drain valve may be extremely hot. To avoid being scalded, make sure all connections are tight and that the water flow is directed away from any person.

SETTING EQUIPMENT - H MODEL

CAUTION

This hydronic air handler as all hydronic air handlers will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

Read the "Safety" and "Preparing for the New Installation" sections prior to installation of the Hydronic Air Handling System before beginning the installation. If you do not completely understand or have any questions contact a qualified installer before proceeding.

The installation must comply not only with this manual but all local and national codes. Installation should allow 25" of clearance in front of the access panel for service. Avoid refrigerant and condensate line routing that makes service panel removal difficult.

Before energizing the air handler, check blower wheel for free rotation.

This piece of equipment is intended for overhead, furred-in installations. It has a return grille and filter to allow return air to enter the unit directly without additional return ducting. When placing the unit, try to choose a location that is central to the dwelling and cannot get isolated by shutting doors. Hallways are usually the best location.

The unit is shipped with two mounting angles, in most installations these will be screwed flush with the top of the unit across its 24" sides. (See Figure 1 and 2). These flanges will then be used to secure the unit to the trusses or rafters. Use 1/4" lag bolts, toggle bolts or threaded rods for this, #8 sheet metal screws may be sufficient. Once the unit is securely hung and the discharge ducting installed, it can be framed in. It is preferable, however, to have the piping done prior to framing to insure easy access to the piping connections and to insure proper grade on the condensation drain.

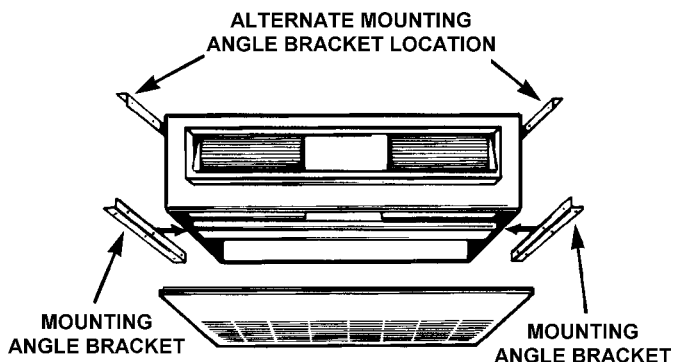


FIGURE 1

The framing should be done with 2 x 4 studs laying flat so that they will not obstruct the holes for piping the drains and hot water connections. The entire perimeter of the unit needs to be framed to provide a nailing surface and the nailing surface should be flush with the bottom flange of the unit. Sheet rock or other ceiling material will finish up to the edge of the unit. The grille

and service panels have 1/2" of overhang at the front and back of the unit, and 3/4" overhang on the sides of the unit.

In some cases, the framing may have to be done prior to hanging the unit. This is more awkward than the above mentioned framing method, but can be done. Due to the discharge flange, it will not be possible to frame out a 24 3/8" x 35 3/8" (or 45 3/8") hole and then slide the unit into place. It is best to provide two nailers 35 3/8" (or 45 3/8") apart with a third stud spanning these at the point where the return end of the cabinet will rest, see Figure 2. The fourth framing member can be attached only after the unit is in place. For this framing method, the mounting angles can be attached to the bottom edge of the unit and then screwed to the framing as shown in Figure 2.

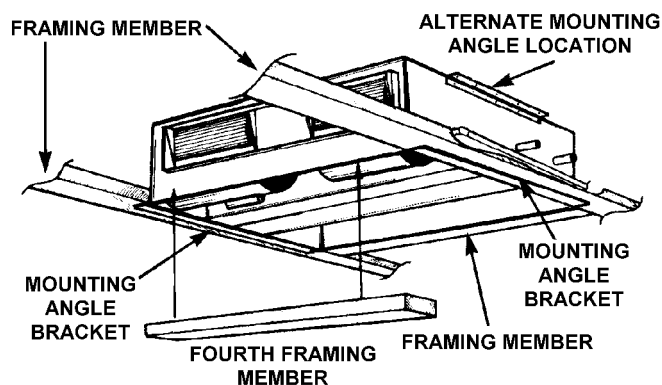


FIGURE 2

Standard Return Air/Service Panel

For proper installation of the service and return air panels, the finished drywall construction in the ceiling around the air handler should come flush with the edge of the cabinet. The service panel should then be attached to the unit at the discharge end with four phillips head screws in the holes provided. The "L" shaped hinge brackets should be slipped into the narrow slots in the return air panel and attached with two hex head screws through the panel and into the brackets as shown in Figure 3. These hinge brackets will then slip through the corresponding notches in the service panel allowing the louvered return panel to pivot up against the cabinet where two phillips head screws will secure it to the cabinet.

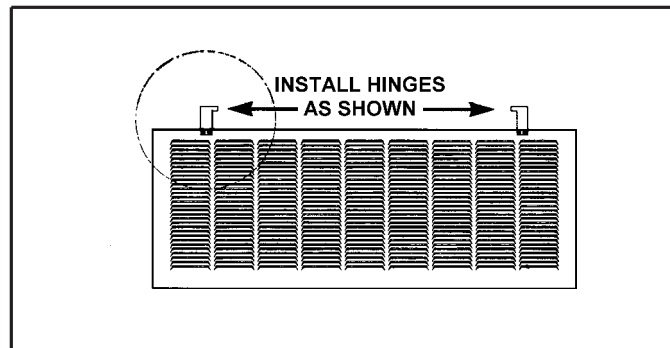


FIGURE 3

Optional Service Panel for Ducted Return

This solid panel is used when the return air is ducted into the back of the unit. It is screwed to the bottom of the unit using the screws provided.

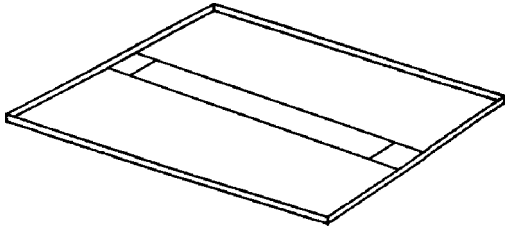


Figure 4

Refrigerant Piping

Holes are provided in the side of the unit through which field installed refrigerant lines can be run. The evaporator coils are fitted with copper stubs to which the refrigerant line should be soldered. Use silver solder or other high temperature brazing alloy intended for refrigeration work. The stubs are located close to the side of the cabinet so it is a good idea to protect the cabinet insulation from flame damage with a small piece of sheet metal. Also, the manufacturer recommends that the refrigerant lines are filled with dry nitrogen before soldering. This will minimize the formation of ash inside the lines that can clog the capillary strainer.

Discharge Ducting

This unit has its blower discharging directly into the supply duct system resulting in high air velocities close to the end of the unit. To insure efficient air flow, the supply plenum attached to this unit should be a minimum of three feet long. Also, outlet runs should tap into this duct as far from the end of the unit as possible.

Condensate Drain

NOTE: Due to the critical elevations involved with the installations of drains for furred-in units, careful attention needs to be given that the drains are secure and that they have adequate grade. It is recommend that the drainage of these units is tested prior to operation by pouring water into the drain pan. Once the ceiling is finished, the drain line will be very inaccessible for service.

The evaporator in this unit is fitted with a drain pan for the removal of condensation. This drain pan is provided with a 7/8" O.D. copper drain. Using the neoprene elbow provided, the primary drain will be connected and directed to either the left or right side opening of the cabinet, see Figure 5.

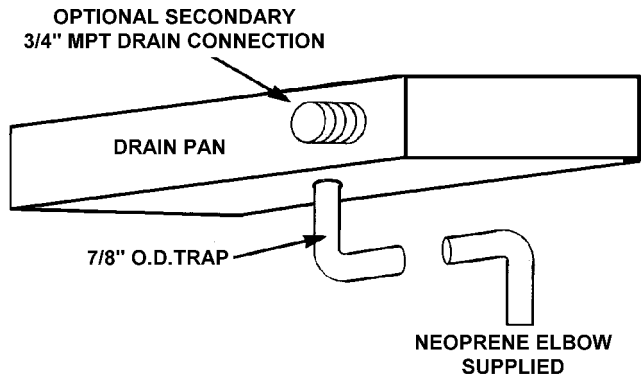


FIGURE 5

A 3/4" MPT is provided for connection of an optional overflow drain. When used it should be piped through the cabinet penetration to an area where any water discharge from it will be noticed.

When horizontal run exceeds 15 feet, a vent tee may be necessary to insure proper drainage.

The condensate drainage system should be tested by pouring water into the unit drain pan prior to operation of the unit.

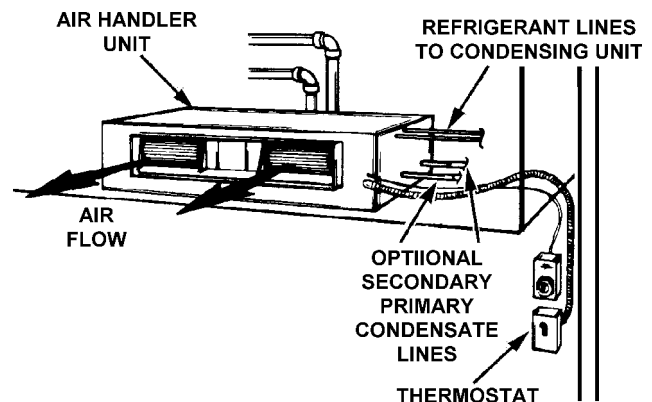
Typical installation

Specifications subject to change without notice. Installation of this product must comply with prevailing building, safety and N.E.C. codes and should be in accordance with manufacturer's instructions.

Refer to the "Typical Installations" section on pages 4 and 5, and installation notes on pages 5 and 6 when connecting the air handler to a water heater without side connections for space heating.

Water heaters used for space heating must be listed and labeled as "suitable for (potable) water heating and space heating".

Water heaters used for space heating must also be used for domestic (potable) water heating.



SETTING EQUIPMENT - HB MODEL

CAUTION

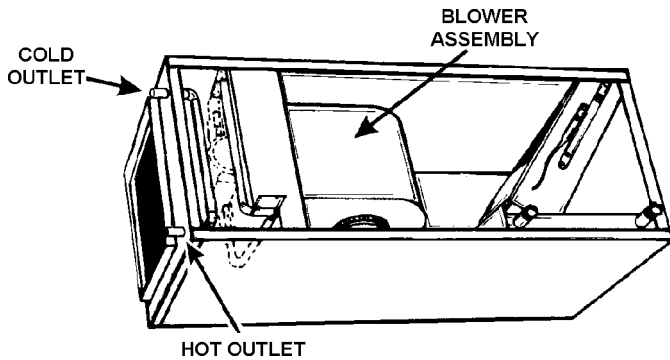
This hydronic air handler as all hydronic air handlers will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

Read the "Safety" and "Preparing for the New Installation" sections prior to installation of the Hydronic Air Handling System before beginning the installation. If you do not completely understand or have any questions contact a qualified installer before proceeding.

The installation must comply not only with this manual but all local and national codes. Installation should allow 25" of clearance in front of the access panel for service. Avoid refrigerant and condensate line routing that makes service panel removal difficult.

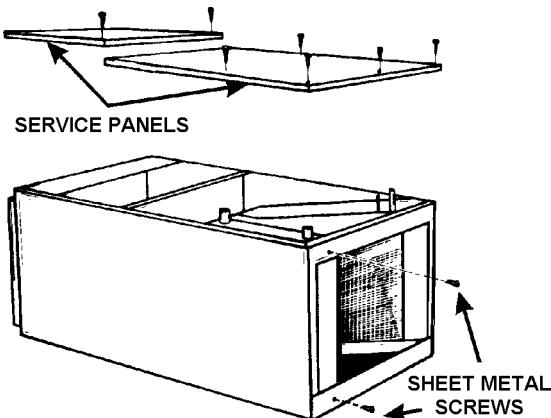
Before energizing the air handler, check blower wheel for free rotation.

These units are designed for horizontal air flow only. If the air handler is installed in an area subject to freezing, consideration of its placement needs to be made.

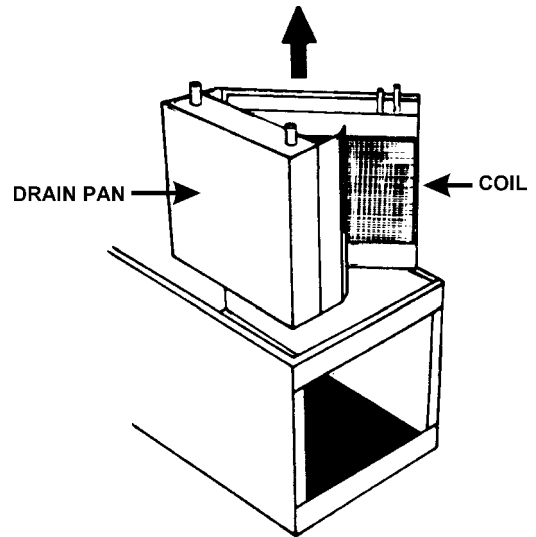


As shipped, the unit is configured for left-hand discharge or airflow. The unit may be converted to right-hand discharge using the following procedure.

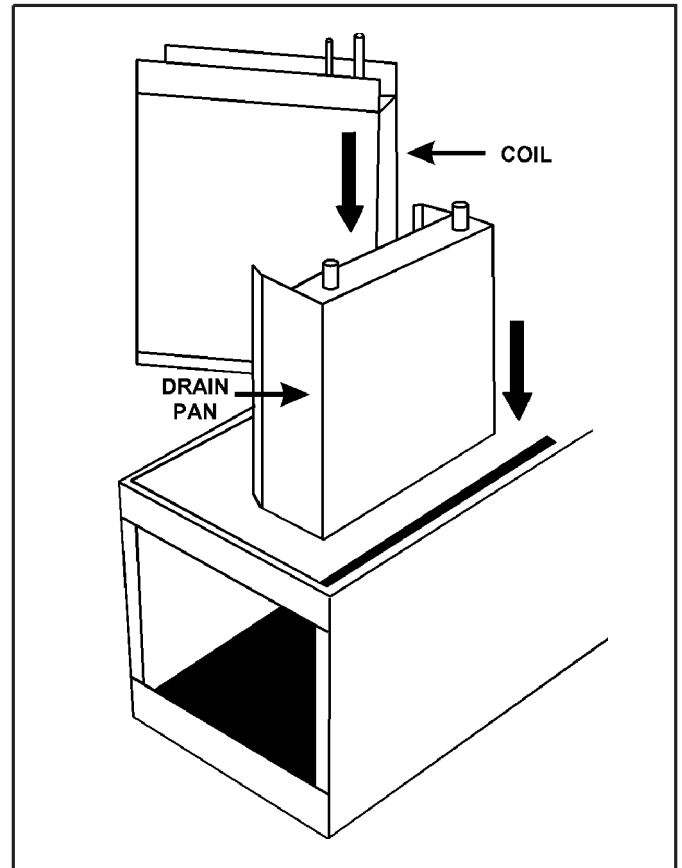
Set the unit such that the service panels face upward. Remove both service panels and then remove the two #10 x 1/2" sheet metal screws securing the drain pan to the cabinet.



With the drain pan screws removed, the coil/pan assembly will slide toward the blower and can then be withdrawn from the cabinet.

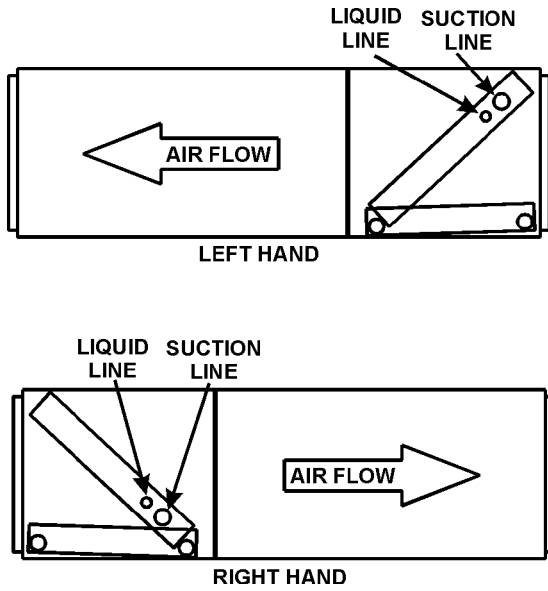


Fit the coil and drain pan together as shown below and install the cabinet. The evaporator should be pushed fully into the return end of the unit before reinstalling the drain pan screws. Allow 25" clearance in front of the access panel for service.



Also, avoid refrigerant and condensate line routing that will make removal of the blower/pump access panel difficult.

EVAPORATOR DETAIL MODEL HB3024



⚠ CAUTION

Installation of the air handler must be accomplished in such a manner that if the condensate drain connections should plug or other causes create an overflow, the flow of (condensation) water will not cause damage to the area adjoining the air handler or to lower floors of the structure. When such locations can't be avoided, a suitable drain pan should be installed under the air handler. Such a pan should be no greater than 1 1/2" deep, have a minimum length and width of at least 2" greater than the air handler dimensions and should be piped to an adequate drain. Under no circumstances is the manufacturer to be held liable for any water damage in connection with this air handler.

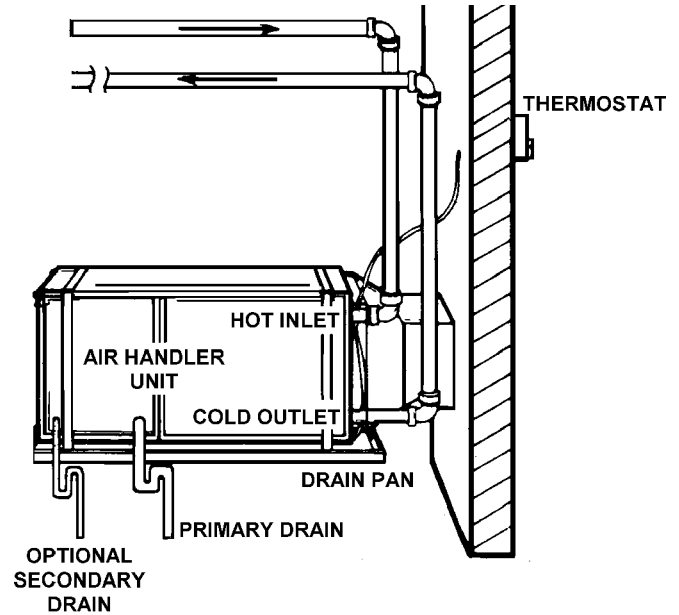
Typical Installation

Specifications subject to change without notice. Installation of this product must comply with prevailing building, safety and N.E.C. codes and should be in accordance with manufacturer's instructions.

Refer to the "Typical Installations" section on pages 4 and 5, and installation notes on page 5 and 6 when connecting the water heater to the air handler.

Water heaters used for space heating must be listed and labeled as "suitable for (potable) water heating and space heating".

Water heaters used for space heating must also be used for domestic (potable) water heating.



SETTING EQUIPMENT - LA, MA & SA MODELS

⚠ CAUTION

This hydronic air handler as all hydronic air handlers will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

Read the "Safety" and "Preparing for the New Installation" sections prior to installation of the Hydronic Air Handling System before beginning the installation. If you do not completely understand or have any questions contact a qualified installer before proceeding.

The installation must comply not only with this manual but all local and national codes. Installation should allow 25" of clearance in front of the access panel for service. Avoid refrigerant and condensate line routing that makes service panel removal difficult.

Before energizing the air handler, check blower wheel for free rotation.

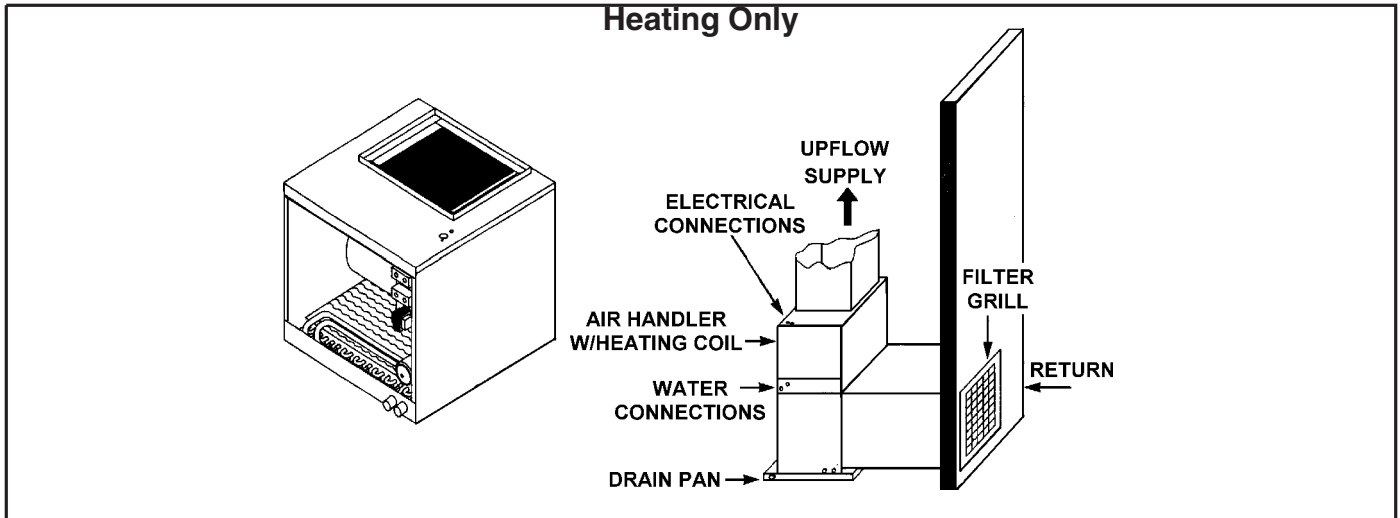
Typical Installation

Specifications subject to change without notice. Installation of this product must comply with prevailing building, safety and N.E.C. codes and should be in accordance with manufacturer's instructions.

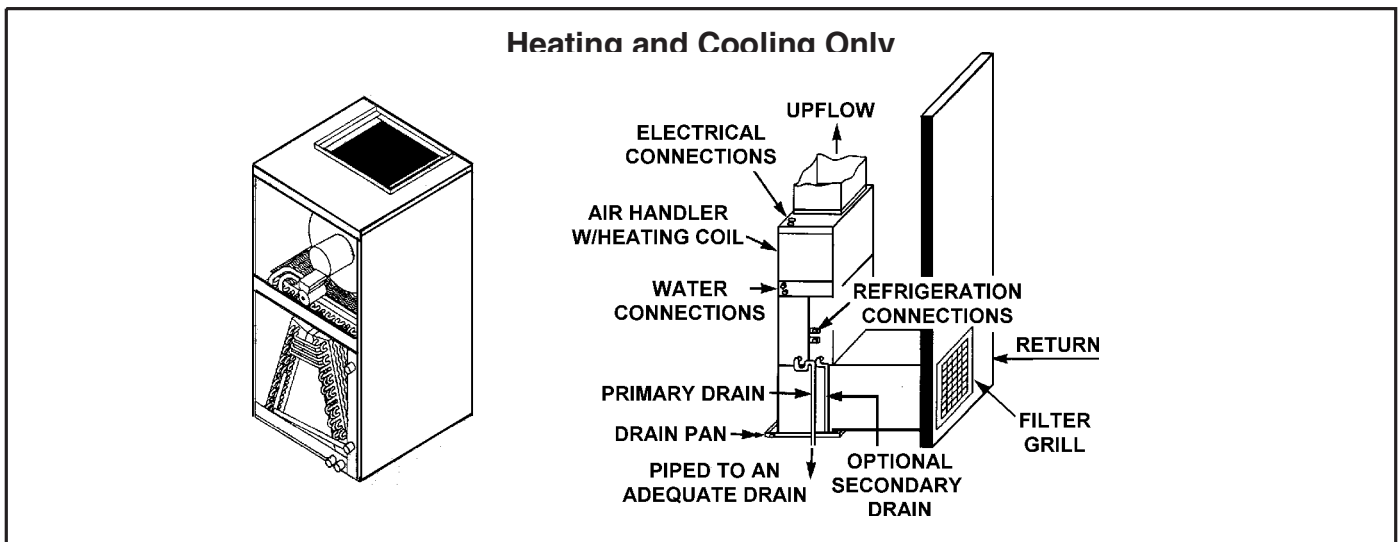
Refer to the "Typical Installations" section on page 5 when connecting the air handler to a water heater without side connections for space heating.

Water heaters used for space heating must be listed and labeled as "suitable for (potable) water heating and space heating".

Water heaters used for space heating must also be used for domestic (potable) water heating.



NOTE: Heating only SA, MA & LA units installed for vertical airflow (upflow or downflow) should never have evaporator coils installed above the air handler.

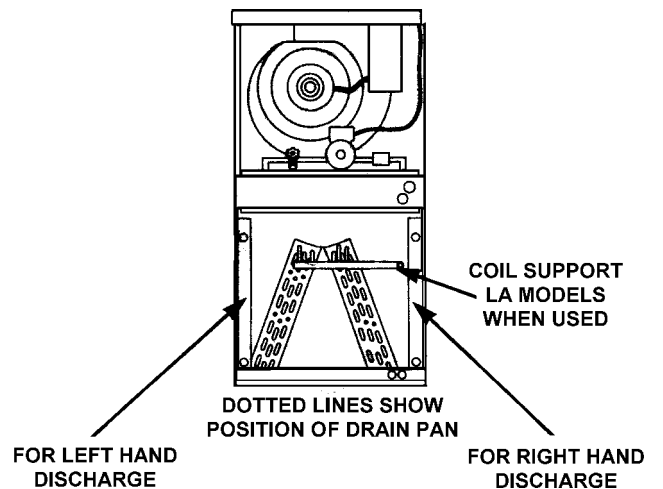
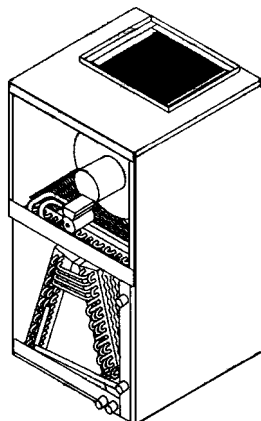


SETTING EQUIPMENT - LA, MA & SA MODELS - WITH EVAPORATOR COIL

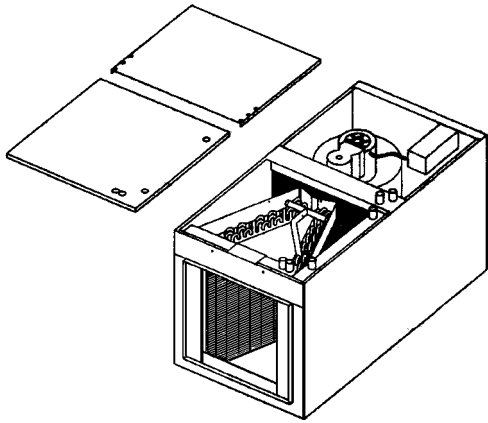
Horizontal Air Flow Conversion from Right hand to Left hand

NOTE: Splash Baffle mandatory for LA horizontal models.

SHOWN STANDARD UPRIGHT POSITION WITH FRONT PANELS REMOVED (TOP DISCHARGE)

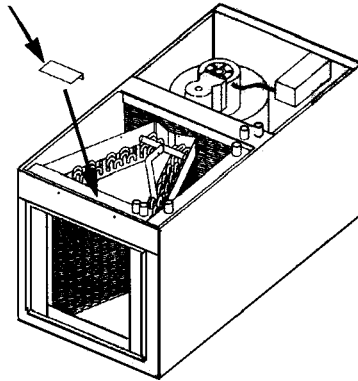


1. Lay the unit on it's back and remove lower panel. For LA Models - RH Horizontal. Install Splash Baffle. Slots in baffle fit tabs on back of drain pan. Install Evaporator Panel.

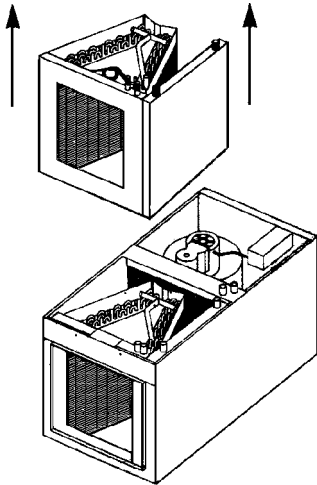


2. Remove coil securing bracket. **NOTE:** LA - Unit may have coil support bracket. Remove and save to install on left side.

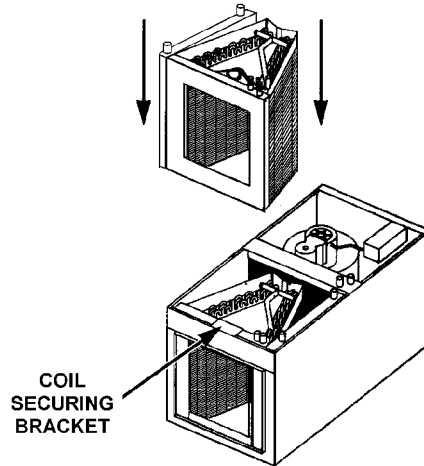
COIL SECURING BRACKET



3. Being careful not to damage the coil, lift it from the cabinet, along with the drain pan.

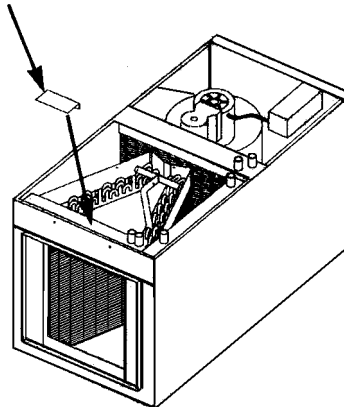


4. Place the drain pan on the coil for left-hand discharge, and return the coil with drain pan into the cabinet. **NOTE:** Drawing shows the drain pan installed for left-hand discharge.

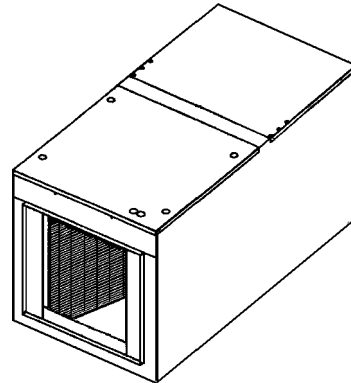


5. Reinstall the coil securing bracket.

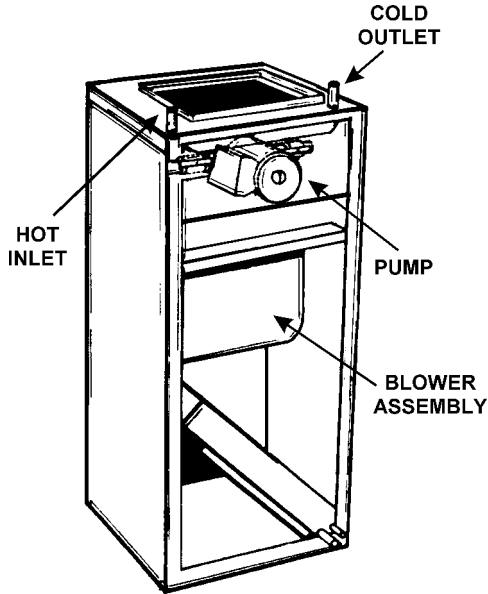
COIL SECURING BRACKET



6. Replace the access panel. **NOTE:** Insulation must be cut away and the rubber plugs moved depending on the position (left or right discharge) of the drain pan.



SETTING EQUIPMENT - VB MODEL



⚠ CAUTION

This hydronic air handler as all hydronic air handlers will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

Read the "Safety" and "Preparing for the New Installation" sections prior to installation of the Hydronic Air Handling System before beginning the installation. If you do not completely understand or have any questions contact a qualified installer before proceeding.

The installation must comply not only with this manual but all local and national codes. Installation should allow 25" of clearance in front of the access panel for service. Avoid refrigerant and condensate line routing that makes service panel removal difficult.

Before energizing the air handler, check blower wheel for free rotation.

These units are for use in upflow applications only. If the air handler is installed in an area subject to freezing, consideration of its placement needs to be made.

⚠ CAUTION

Installation of the air handler must be accomplished in such a manner that if the condensate drain connections should plug or other causes create an overflow, the flow of (condensation) water

will not cause damage to the area adjoining the air handler or to lower floors of the structure. When such locations can't be avoided, a suitable drain pan should be installed under the air handler. Such a pan should be no greater than 1 1/2" deep, have a minimum length and width of at least 2" greater than the air handler dimensions and should be piped to an adequate drain. Under no circumstances is the manufacturer to be held liable for any water damage in connection with this air handler.

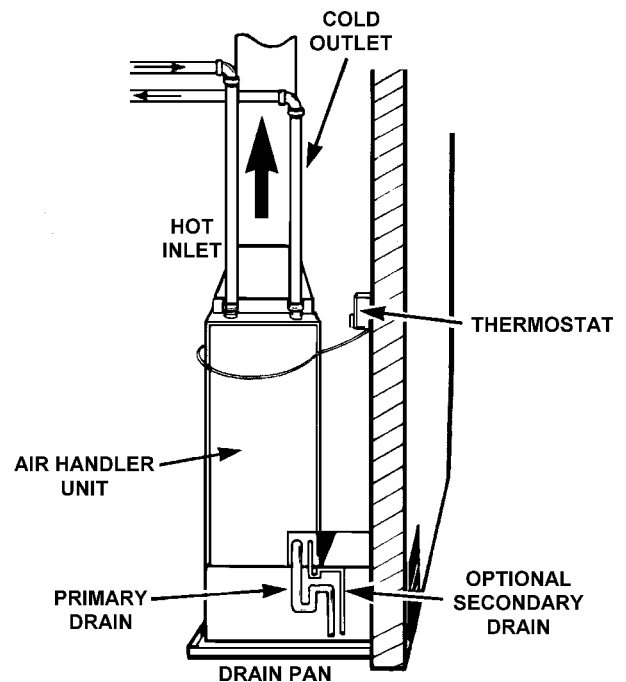
Typical Installation

Specifications subject to change without notice. Installation of this product must comply with prevailing building, safety and National Electric Code and should be in accordance with manufacturer's instructions.

Refer to the "Typical Installations" section on pages 4 and 5, and installation notes on pages 5 and 6 when connecting the water heater to the air handler.

Water heaters used for space heating must be listed and labeled as "suitable for (potable) water heating and space heating".

Water heaters used for space heating must also be used for domestic (potable) water heating.



SETTING EQUIPMENT - W MODELS

⚠ CAUTION

This hydronic air handler as all hydronic air handlers will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

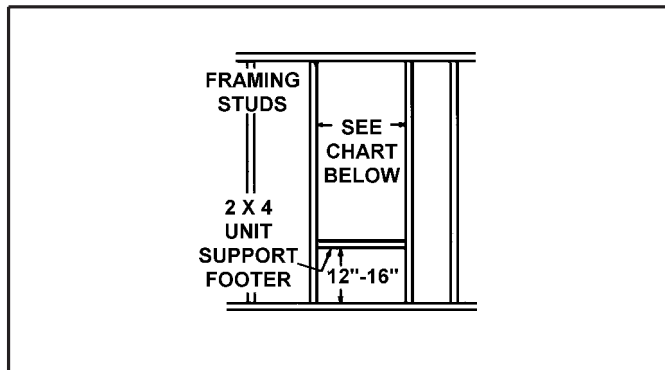
Read the "Safety" and "Preparing for the New Installation" sections prior to installation of the Hydronic Air Handling System before beginning the installation. If you do not completely understand or have any questions contact a qualified installer before proceeding.

The installation must comply not only with this manual but all local and national codes. Installation should allow 25" of clearance in front of the access panel for service.

Before energizing the air handler, check blower wheel for free rotation.

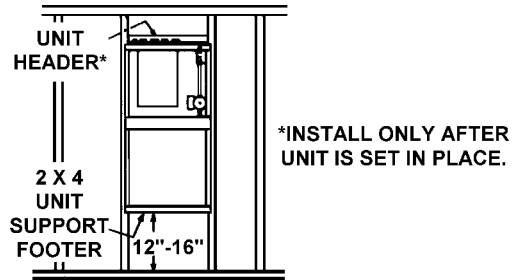
There are two methods of framing in-the-wall mount units. The first method described is easiest while the second lends itself to applications where the unit placement is more critical. The units should be hung prior to the installation of sheet rock or other wall covering.

Method one involves using one stud in its original placement and moving the neighboring stud to provide an opening the width as shown in the chart. Then, a unit support "footer" should be installed between the vertical studs approximately 12" to 16" off the floor. The unit footer should be level and substantial enough to support 150 pounds.



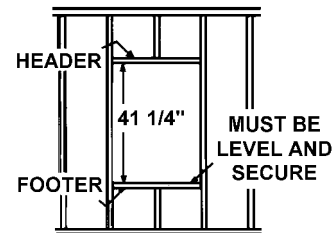
MODEL	WIDTH	
	MIN.	MAX.
W-2618	19 1/2"	19 7/8"
W-30-H	19 1/2"	19 7/8"
W-3024	19 1/2"	19 7/8"
W-4230	27"	27 1/4"
W--45-H	27"	27 1/4"
W04535	27"	27 1/4"

Next, the unit must be set in place and a header installed across the top of the unit. The unit can be secured by screwing downward through the bottom of the unit into the footer, and upward into the header.

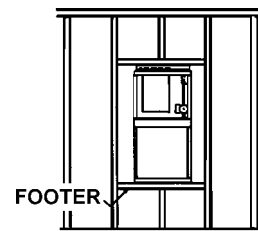


Make sure that the 1" outward flanges on the unit rest on the vertical studs as flatly as possible, sheet rock (or other wall covering) will finish on top of this flange and secure to the exposed two by four studs on either side of the flanges. Once installed, the cabinet penetrations for low and line voltage connections and for refrigerant line connections should not be obstructed by framing members.

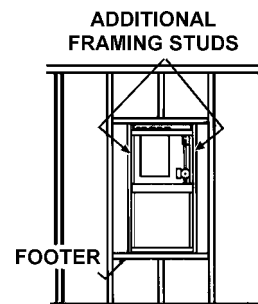
The second method, as shown below, involves placing a framing footer and header across two stud spaces with 41 3/4" vertical clearance between them. Vertical studs should then be installed at 16" on-center to provide a nailer for sheet rock.



The unit will have to be set in from behind the wall (due to the supply duct connection and pipe stubs) and can then be secured top and bottom to the header and footer.



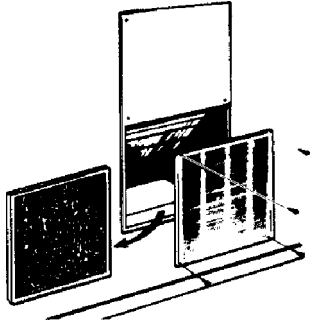
The illustration below shows the addition of framing studs behind the unit's vertical flanges providing a nailer for sheet rock. These can be left off if the sheet rock is screwed to the flanges.



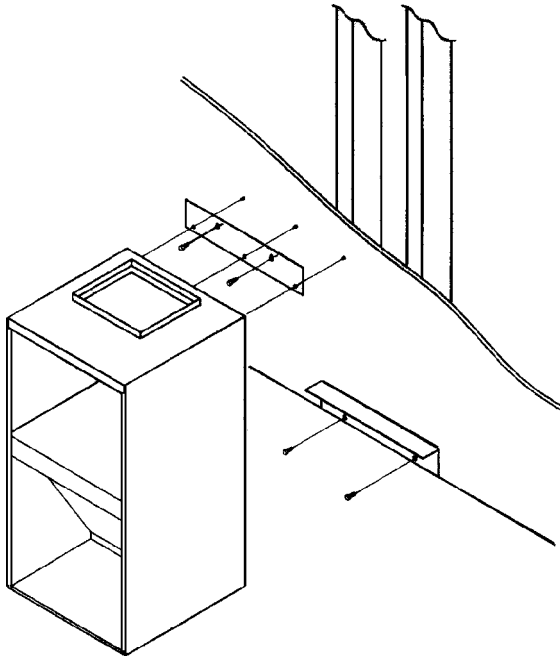
Air Filter

Air handlers are factory equipped with an air filter.

Removing the access panel will gain access to the filter. It should be checked periodically and replaced if necessary. The filter is a standard item that can be obtained at hardware stores.

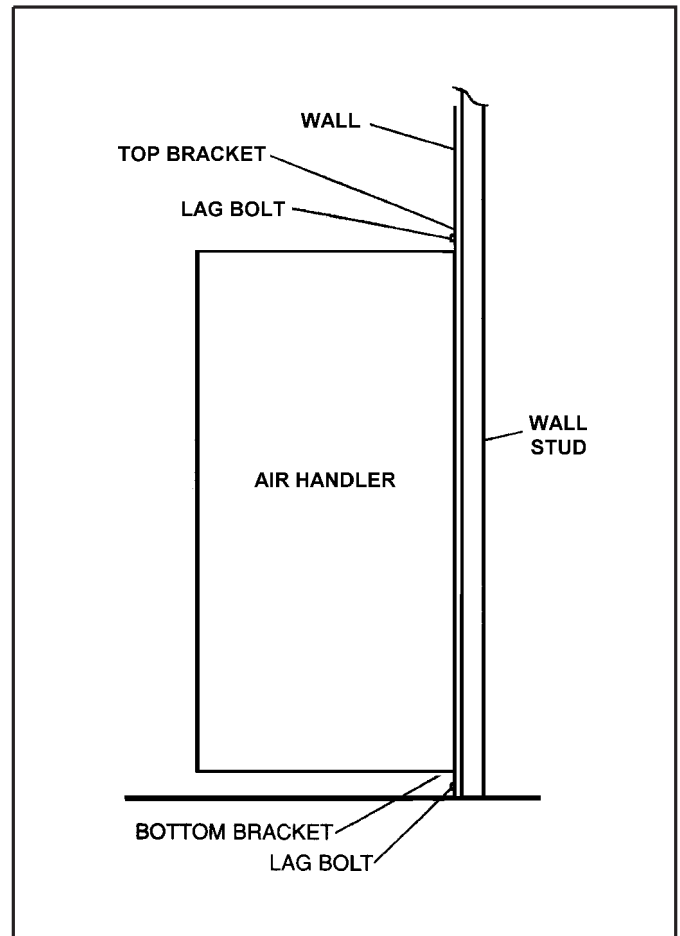
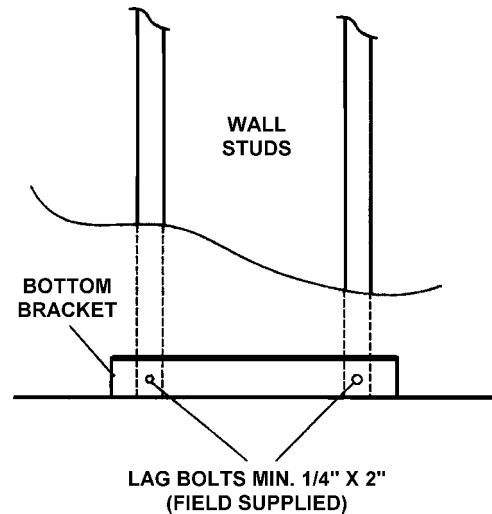


Wall Mounting Instructions



1. Remove the 3 sheet metal screws on the top rear of cabinet. They will not be reused.
2. Align the top wall mounting bracket with the holes in the cabinet. Using the new #10 sheet metal screws, attach the top bracket to the cabinet.
3. Locate wall studs at the point at which the air handler is to be mounted. **NOTE:** Larger W Model uses three lag bolts.
4. Using (field supplied) minimum 1/4" x 2" lag bolts attach the bottom mounting bracket.

5. Set the air handler on the bottom mounting bracket.
6. Adjust the air handler on the bottom bracket so that the top mounting bracket holes align with the wall studs.
7. Using (field supplied) minimum 1/4" x 2" lag bolts attach the top mounting bracket (air handler) to the wall.



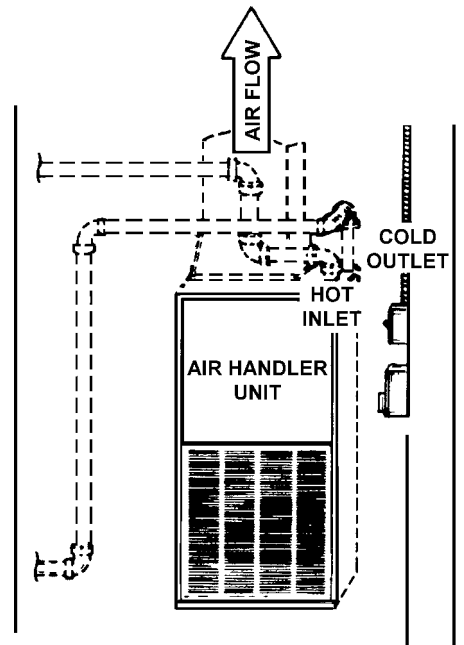
Typical Installation

Specifications subject to change without notice. Installation of this product must comply with prevailing building, safety and National Electric Code and should be in accordance with manufacturer's instructions.

Refer to the "Typical Installations" section on pages 4 and 5, and installation notes on pages 5 and 6 when connecting the water heater to the air handler.

Water heaters used for space heating must be listed and labeled as "suitable for (potable) water heating and space heating".

Water heaters used for space heating must also be used for domestic (potable) water heating.



TROUBLESHOOTING

Do's and Don'ts

For Combination Space Heating/Domestic Potable Water Systems

DO flush out all supply and return water lines between the air handler and the water heater after installation and before start-up to eliminate flux, metal chips, sand, or other particulate matter just as you would with any plumbing system.

DO NOT operate in air-conditioning mode when any of the following conditions exist:

- Inside or outside temperatures below 65°F.
- Low or restricted air flow.
- Low refrigeration charge.

DO NOT use with baseboard radiation (or other system) that has been served by non-potable water such as boiler water or any other possible non-potable source.

DO NOT use the air handler in conjunction with new finned tube baseboard radiation or convectors until you have properly determined the capacity of those units with water inlet temperatures of 140°F (or the temperature water you are going to use).

DO NOT use with piping that has been treated with chromates, boiler seal or other chemicals.

DO NOT add boiler treatment or any chemicals to any air handler piping, when used in a potable water system.

DO NOT use with ferrous piping. The system should be installed only with new piping that is suitable for hot, potable water. Do not use with PVC piping.

DO NOT use any pumps, valves or fittings that are not completely compatible with hot potable water piping.

DO NOT use valves that may cause excessive restriction to waterflow. Use full flow ball or gate valves only.

DO NOT use an air handler with any water heater not having a properly sized and installed temperature pressure (T & P) relief valve. Some water heaters include factory-installed valves. Others must be field-installed. Follow the instructions of the water heater manufacturer and local codes when installing the T & P valve.

DO NOT alter the water heater controls, dip tube, relief valve, fitting, etc. The air handler does not require any modification to a water heater. To do so may void the manufacturer's warranty.

DO NOT install air handler piping in any manner except as shown in the instruction manual.

SOME JURISDICTIONS may require a backflow preventer in the incoming cold water line to the water heater. In such cases, the temperature-pressure valve on the water heater may weep or relieve due to expansion of the water when heated. Note that this would occur even if an air handler system were not installed. If a system (air handler/water heater) is installed in a closed and/or high pressure water system, contact the water supplier or local plumbing contractor on how to control this situation.

Air Handler Service Checklist

IMPORTANT: Disconnect power source before servicing.

CONDITION	PROBABLE CAUSE	POSSIBLE REMEDY
SYSTEM WILL NOT OPERATE	Water heater pilot out.	Relight pilot.
	Service switch turned off.	Turn on switch.
	Circuit breaker off.	Reset circuit breaker.
	Fuse blown.	Replace bad fuse.
	System off at water heater thermostat.	Check thermostat
	System off at air handler thermostat.	Check thermostat.
	Loose wiring.	Check electrical wiring.
	Thermostat inoperative.	Replace
NO HEAT	Water heater pilot out.	Relight pilot.
	Power not on.	Turn on power.
	Water heater not working.	Check water heater.
	Pump air bound.	Follow system Start-Up procedure.
	Pump seized.	Disassemble and check cause.
	Check valve stuck.	Remove obstruction.
	Thermostat inoperative.	Replace.
	Incorrect thermostat.	Install correct thermostat. See instructions.
	Pump inoperative.	Replace pump.
	Pump relay inoperative.	Replace pump relay.
	Isolation valves "OFF".	Turn valves "ON". See instructions.
	No water in system.	Fill and vent system properly.
	Water not circulating	Check piping for restrictions, air locks or flow direction.
	Pump backwards.	Reinstall properly or switch supply and return pipes.
INSUFFICIENT HEAT	Water heater thermostat set too low.	Turn control up.
	Water heater input too low.	Install properly size unit.
	Filters clogged.	Replace filters.
	Air handler too small.	Install properly sized unit.
	Blower speed too low.	Set higher speed.
	Heat registers closed	Open registers.
	Depneumatic not installed properly.	Install properly. See instructions.
	Water heater dip tube not installed correctly.	Install properly. See water heater instructions.
	Uninsulated water lines.	Insulate properly.
	Wall thermostat inoperative.	Repair or replace.
	Unit panels off.	Reinstall panels.
	Water lines restricted.	Remove restriction.
	Ducts loose or blocked.	Repair ductwork.
	Sediment build-up.	Clean water heater tank.
NOT ENOUGH DOMESTIC HOT WATER	Water heater control set too low.	Raise setting. See water heater instructions. See warnings.
	Water heater not adjusted for rated BTU.	Set proper input. See water heater instructions.
	Water lines not insulated.	Insulate hot water piping.
	Draw exceeds recovery rate of water heater.	Reduce rate of draw until heater recovers.
	Dip tube broken or not installed properly.	See water heater instructions.
BLOWER NOISY	Blower wheel scraping sides.	Re-align wheel.
	Blower wheel not balanced.	Replace wheel.
	Blower wheel loose.	Tighten set screw.
	Motor shaft bent.	Replace motor.
	Blower mounting loose.	Tighten screws.
	Objects in blower wheel.	Remove debris.
BLOWER DOES NOT OPERATE	Inoperative blower relay.	Replace relay.
	Transformer bad.	Replace transformer.
	Motor inoperative.	Replace motor.
	Incorrect or loose wires.	Correct wiring.
	Motor overload.	Remove cause of overload.
	Inoperative capacitor.	Replace.
Consult air conditioning installation and service instructions if your system does not cool properly.		



5 Year Heating Coil - 5 Year Evaporator coil - 1 Year Parts

PRODUCT WARRANTY

Space Heating Air Handler, Fan Coil Unit or Heating Coil Unit

5 YEAR LIMITED WARRANTY ON HEATING COIL

The "Company" warrants the copper-tube aluminum fin heating coil (heat exchanger) in this unit in case of a leak within five (5) years from the date of purchase or, in the absence of a Bill of Sale verifying said date, from the date indicated on the serial plate affixed to this unit; see EXCLUSIONS AND LIMITATIONS below. In case of a defect, causing water leakage from this coil, or failure to conform to this warranty, the Company will repair or replace this heating coil. No labor, installation, or freight (if any) charges are included in this warranty. You must pay these costs.

5 YEAR LIMITED WARRANTY ON EVAPORATOR (COOLING) COIL (IF ANY)

The Company warrants the copper-tube, aluminum fin evaporator (cooling) coil in this unit, if one is included and provided that said coil was manufactured or furnished by the Company, in case of a refrigerant leak within 5 years from the date of purchase, or in the absence of a Bill of Sale verifying said date, from the date indicated on the serial plate affixed to the unit; see EXCLUSIONS AND LIMITATIONS below. In case of a defect in material or workmanship causing a refrigerant leak from the coil or failure to conform to this warranty, the Company will repair or replace this evaporator coil. No labor, installation, or freight (if any) charges are included in this warranty. You must pay these costs.

LIMITED WARRANTY ON ALL OTHER PARTS

The Company warrants all other component parts of this unit to be free from defects in material and workmanship for a period of one (1) year from the date of purchase, or, in the absence of a Bill of Sale verifying said date, from the date indicated on the serial plate affixed to the unit; see EXCLUSIONS AND LIMITATIONS below. In case of a defect, malfunction or failure to conform to this warranty, the Company will repair or replace, at its option, the parts. No labor, installation, or freight (if any) charges are included in this warranty. You must pay the costs.

EXCLUSIONS AND LIMITATIONS OF THESE LIMITED WARRANTIES

1. THE LIMITED WARRANTIES PROVIDED HEREIN ARE IN LIEU OF ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO,

IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE; PROVIDED, HOWEVER, THAT IMPLIED WARRANTIES ARE NOT DISCLAIMED DURING THE ONE-YEAR PERIOD FROM DATE OF PURCHASE. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

2. The Company shall have no liability hereunder, either or contingent, for incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

3. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

4. These warranties shall be void and shall have no effect:

a. If the design or structure of the unit is, or is attempted to be, modified or altered in any way, including, but not limited to, by attaching non-Company approved appliances or equipment.

b. If the unit is not properly installed in accordance with the latest issue of (1) the National Electric Code; (2) all local ordinances and regulations pertinent to this unit; and (3) the installation and instruction manual provided with this unit.

c. If the water heating vessel in the hydronic loop is not equipped with new pressure protective equipment required by local codes, but not less than a pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for relief valves. This valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the tank.

d. If the air handler is not operated within factory calibrated limits

e. If leaks in the Heating Coil or Evaporator Coil, or defects in other parts, arise as the result of improper use, negligence in operation, or accident, or inability of the unit to function because of repairs, adjustments,

or replacements improperly made outside the Company's factory, or because of fire, floods or lighting.

- f. If leaks in the Heating Coil or Evaporator Coil arise as a result of puncture by screws or other pointed objects used during installation or servicing of the unit.
- g. If the serial plate has been defaced or discarded and you do not have a Bill of Sale to verify the purchase date.
- h. If (1) installed in an area where leakage of the air handler or connections would result in damage to the area adjacent to the unit or beneath the unit, or (2) where such a location is unavoidable, a suitable drain pan is not installed under the unit, When a drain pan must be used, the pan must be 1 1/2" deep and must have a minimum size at least 2" greater than the length and width of the unit on all sides, must conform to local code requirements (if any), and must be piped to an adequate drain using minimum 1/2" pipe with continuous slope away from the unit. The drain line should terminate in a location where drainage water flowing would be visible to the eye.
- i. If the air handler is used for any purpose other than expansion of hydronic space heating and cooling systems.
- j. If the air handler is used with any equipment or system that uses heavily chlorinated or otherwise non-potable water.
- k. If the unit water circuit or refrigerant circuit is subjected to pressures or temperatures greater than those maximum values specified on the unit rating plate or in the installation instructions.
- l. If leaks in the Heating Coil or Evaporator Coil develop as a result of the unit being exposed to or handling air from highly corrosive atmospheric condition.
- m. If leaks in the Heating Coil or defects in other parts occur as the result of the unit being operated with desalinated (deionized) water.
- n. If leaks in the tank or defects in other parts arise as a result of sizing that does not comply with the

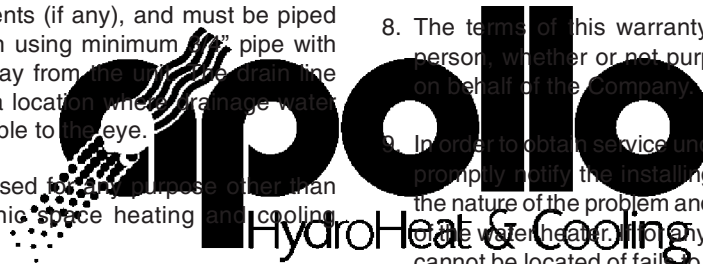
manufacturer's currently published sizing guides or sizing recommended by the manufacturer.

- o. If this air handler or any part has been under water.
- 5. This warranty does not apply to air filters, to any part attached to the unit that was not furnished by the Company, to damage caused by freezing when the unit is installed in an unconditional space, or to damage resulting from application of improper electrical service or voltage.
- 6. This warranty does not apply to connecting tubing installed external to the unit, not to the joints or connections of said tubing to the unit.
- 7. Replacements and/or repairs furnished under these warranties do not carry a new warranty, only the unexpired portion of the original warranty.
- 8. The terms of this warranty may not be varied by any person, whether or not purporting to represent or to act on behalf of the Company.
- 9. In order to obtain service under these warranties you must promptly notify the installing contractor or dealer, giving the nature of the problem and the model and serial number of the water heater. If for any reason the installer or dealer cannot be located or fails to provide satisfactory warranty service, you should write the Company with the above information.

If after inspection, the installer or dealer, or the Company, determines that repair or replacement is required under these warranties, you must pay the freight charges involved, if any, including those to return the defective part(s) or unit.

This warranty does not apply to products installed in California.

Should governmental regulations or industry standards prohibit the Manufacturer from furnishing a comparable model replacement under this warranty, the Owner will be furnished with the closest comparable water heater meeting the then current governmental regulations and industry standards. A supplementary fee may be assessed to cover the additional cost associated with the changes made to meet applicable regulations and standards.





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