



**ASPEN**  
MANUFACTURING

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## INSTALLATION INSTRUCTIONS FMW SERIES MULTI-POSITION HYDRONIC AIR HANDLER



**IMPORTANT:** "The United States Environmental Protection Agency ("EPA") has issued various regulations regarding the introduction of disposal of refrigerants in this unit. Failure to follow these regulations may harm the environment and can lead to the imposition of substantial fines. Because these regulations may vary due to the passage of new laws we suggest that any work on this unit be done by a certified technician. Should you have any questions please contact the local office of EPA."

**IMPORTANT MESSAGE TO OWNER:** These instructions should be carefully read and kept near product, for future reference. While these instructions are addressed primarily to the installer, useful maintenance information is included. Have your installing dealer acquaint you with the operating characteristics of the product and periodic homeowner maintenance requirements. As expressed in our product warranty, Aspen will not be billed for any structural damage due to failure to follow these installation requirements.

### CODES AND REGULATIONS

This product is designed and manufactured to permit installation in accordance with National Codes. It is the installers responsibility to install the product in accordance with National Codes and/or prevailing local codes and regulations. The manufacturer assumes no responsibility for equipment installed in violation of any code or regulation.

### INSPECTION

This product has been inspected and run tested at the factory and released to the transportation agency without known damage. Inspect exterior of carton for evidence of rough handling in shipment. Unpack carefully, if damage is found, report immediately to the transportation agency.

### REPLACEMENT PARTS

Order all replacement parts through your local distributor. When ordering parts, give complete model and serial number as shown on the unit rating plate.

## BLOWER DATA

MODEL	MOTOR SPEED	MOTOR HP	MOTOR VOLTAGE	CFM VS. EXTERNAL STATIC PRESSURE (2,3)					
				0.10	0.15	0.20	0.30	0.40	0.50
FMWXX - 18	LOW	0.20	120	890	875	860	845	810	(4)
FMWXX - 24	HIGH	0.20	120	1020	1005	990	975	939	(4)
FMWXX - 30	LOW	0.33	120	1116	1094	1069	1010	960	(4)
FMWXX - 36	HIGH	0.33	120	1233	1203	1178	1121	1054	(4)
FMWXX - 37	HIGH	0.33	120	1283	1253	1228	1171	1104	(4)
FMWXX - 42	LOW	0.75	120	1507	1500	1493	1470	1452	1431
FMWXX - 48	MEDIUM	0.75	120	1823	1815	1806	1782	1753	1717
FMWXX - 60/61	HIGH	0.75	120	2180	2160	2141	2081	2051	1989

- 1) 70° EAT
- 2) Dry coil with filter in place
- 3) For 208v operation multiply by .90
- 4) Not rated.

INSTALLATION CLEARANCES		
TOP	OPERATION	SERVICE
	0"	0"
FRONT	0"	30"
SIDES	0"	0"
REAR	0"	0"

### INSTALLATION

#### PRODUCT LOCATION

In an attic installation, where unit is resting on the floor, a suitable isolation pad should be provided to minimize equipment sound transmission to ceiling below. FURTHERMORE, IN ALL COOLING APPLICATIONS, A SECONDARY DRAIN PAN MUST BE PROVIDED BY THE INSTALLER AND PLACED UNDER THE ENTIRE UNIT WITH A SEPARATE DRAIN LINE PROPERLY SLOPED AND TERMINATED IN AN AREA VISABLE TO OWNER. THIS SECONDARY PAN CAN PROVIDE EXTRA PROTECTION TO THE AREA UNDER THE UNIT SHOULD THE PRIMARY DRAIN PLUG UP AND OVERFLOW. AS EXPRESSED IN OUR PRODUCT WARRANTY, ASPEN WILL NOT BE BILLED FOR ANY STRUCTURAL DAMAGE DUE TO THE FAILURE TO FOLLOW THIS INSTALLATION REQUIREMENT.

The furnace is completely serviceable from the front. All Units are approved for 0" clearance.

This Hydronic Furnace allows substantial freedom in positioning the product to best serve the structure requirements. Units may, without field modification, be positioned for up or right horizontal application. With field modification the air handler can be positioned for left horizontal application. See page 6 for detailed installation instructions. This air handler can also be used in the counter-flow application. See page 7 for details.

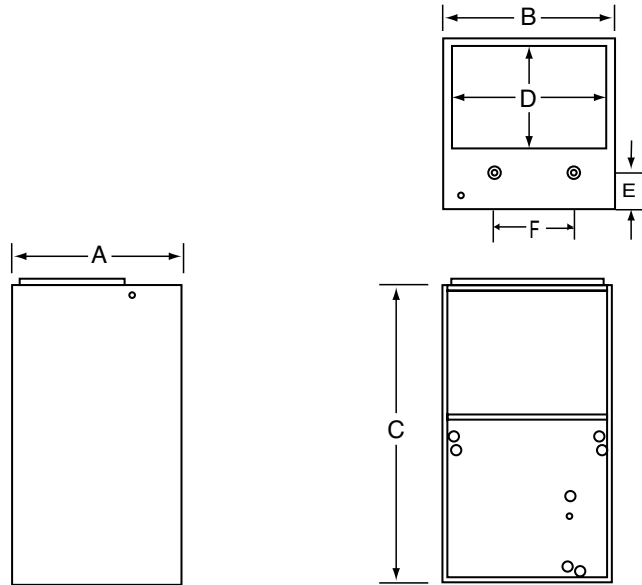
#### INSTALLATION NOTES

This unit must be installed in accordance with all local and national codes.

If screws or holes must be drilled into fan coil cabinet, check carefully to insure that no damage is done to internal components.

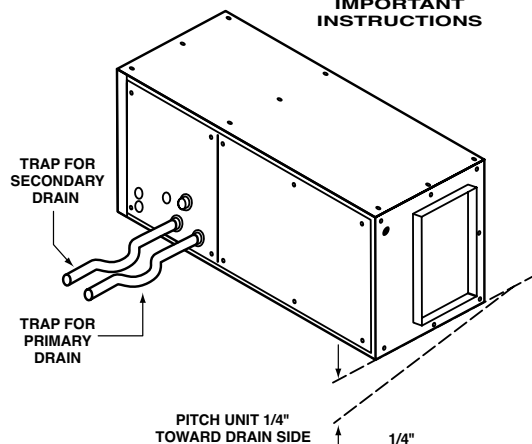
Use a low temperature, NON-LEAD solder on all water line copper joints.

Insulate all water piping as necessary to prevent freezing.



Model	A	B	C	D	E	F
FMWXX 18-37	20	20	43.12	18 x 12	4.62	15.0
FMWXX 42-61	27.5	21.5	52.25	19.5 x 19.5	4.62	15.5

#### HORIZONTAL APPLICATION IMPORTANT INSTRUCTIONS

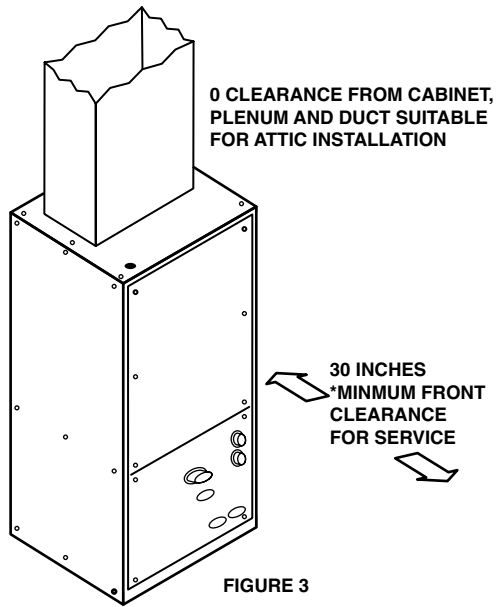


#### WARNING!

If a back flow preventer is installed in the system, an expansion tank is necessary.

#### WARNING!

The hot water coil and all water lines must be purged of air before the hot water pump can be energized. Failure to purge the water system of air can result in damage to the pump.



## DUCT INSTALLATION

Air duct systems should be installed in accordance with standards for air conditioning systems, National Fire Protection Association Pamphlet No. 90A or 90B. They should be sized in accordance with National Environmental System Contractors Association Manual K, or whichever is applicable.

On any job, non-flammable flexible collars should be used for the return air and discharge connections to prevent transmission of vibration. Although these units have been specially designed for quiet vibration-free operation, air ducts can act as sound boards and could, if poorly installed, amplify the slightest vibration to the annoyance level.

All main supply and return air drops should be run full size as determined by the designer of the duct system and should not necessarily be the size of the duct flange openings of the unit

When installing a central air return grille in or near the living space, it is advisable to design the ductwork so that the grille is not in direct line with the opening in the unit. One or two elbows and acoustical duct liner will also assure a quieter installation and system.

It is recommended that wherever supply and return air sheet metal duct pass through unconditioned areas, they be insulated to prevent excessive heat loss during heating operation. When applied in conjunction with summer air conditioning, sheet metal duct routed through unconditioned areas should be insulated and have an outside vapor barrier to prevent formation of condensation.

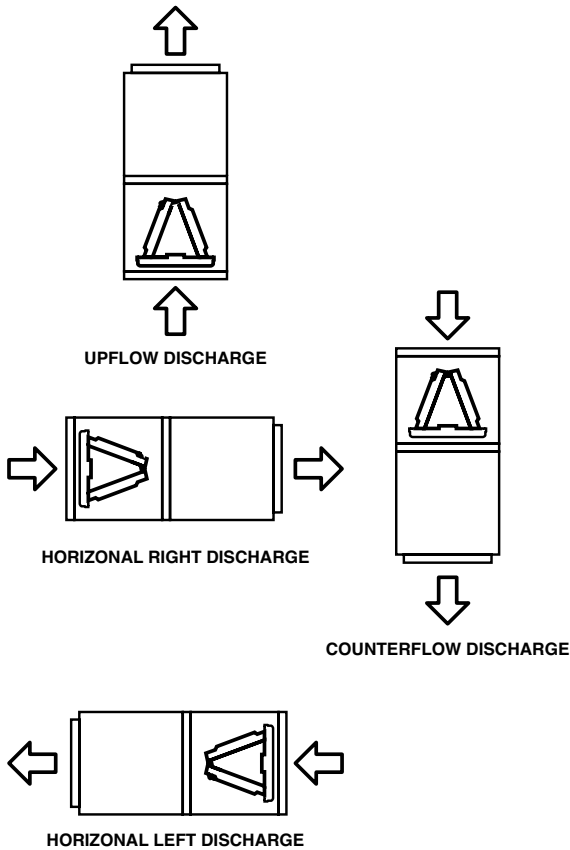
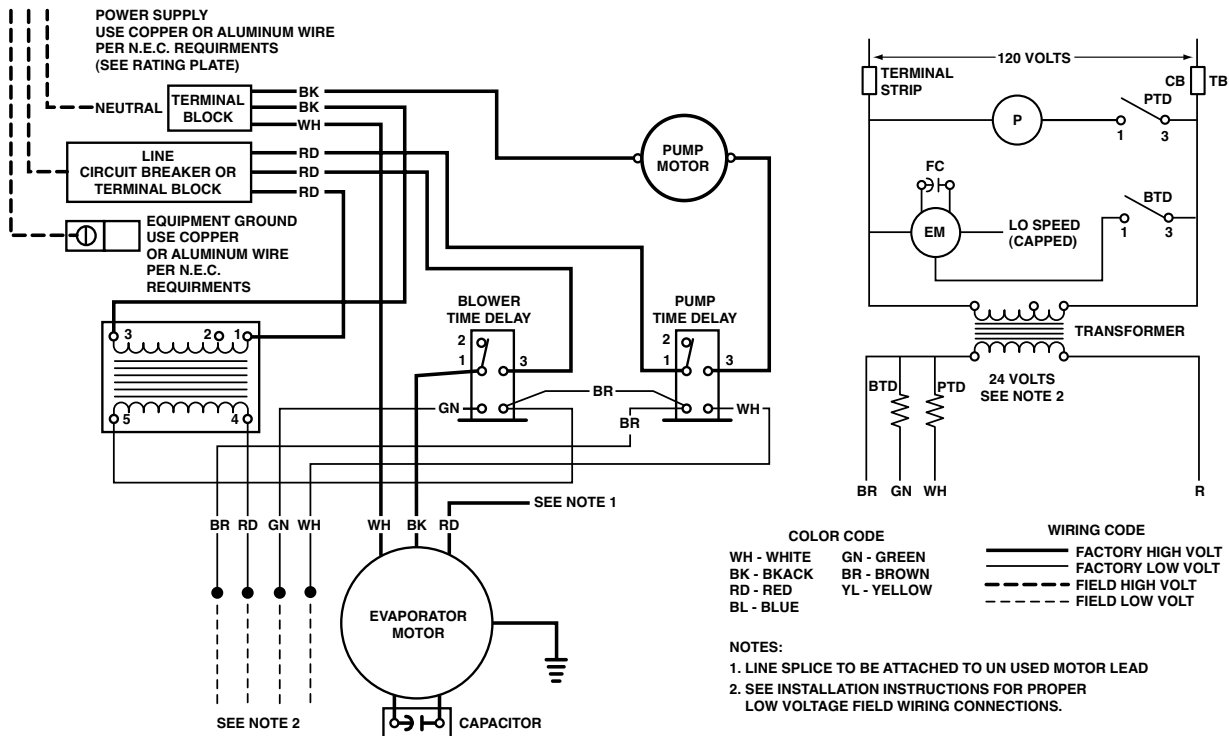


FIGURE 2



**REFRIGERANT PIPING**

Refrigerant piping should follow the recommended procedures set forth in the appropriate manual. Refrigerant piping exits the door. Consideration should be given to routing refrigerant lines during installation, so bottom door can be removed for access. Insulation on the suction line must extend into cabinet and continue as far as possible to eliminate condensation from dripping on to access door insulation.

**CONDENSATE PIPING**

Any refrigerant coil used requires condensate connections. An auxiliary drain pan must be installed on installations where condensate overflow may cause damage.

ALL CONDENSATE LINES (PRIMARY AND SECONDARY) MUST BE TRAPPED SINCE COIL CAVITY IS UPSTREAM OF THE BLOWER.

**ELECTRICAL INSTALLATION**

These units are designed for single phase 120 volt 60 Hertz power supply. Wire selection and wiring must be in accordance with the National Electric Code and/or local codes. Unit terminals are designed to accommodate copper and aluminum wiring. If aluminum wiring is used, please observe the special precautions relative to sizing, handling, wire connections and corrosion protection.

**ELECTRICAL WIRING**

All information needed to connect the 120VAC supply and 24VAC control wiring is supplied with the unit. Two knockouts are located for connection of power and control wiring. Since this unit is supplied with a 24 volt Class 2 transformer, a thermostat with isolating contacts must be used when connecting other add-on equipment using a Class 2 transformer.

**EVAPORATOR COIL CONNECTIONS**

This fan coil uses a factory installed fixed orifice piston to meter the refrigerant for the evaporator coil. This allows the fan coil to be matched with either a heat pump or a standard condensing unit. The size of the suction and liquid refrigerant lines is determined by the instructions supplied with the outdoor unit. The evaporator coil has a nitrogen charge from the factory and must be dumped before being connected. The connections for both the liquid refrigerant and the suction lines are sweated connections.

## START UP

After all connections are made, start up and check out of the unit must be performed before proper evaluation of the entire system can be made. Make sure that heat anticipator is properly set as noted on low voltage wiring diagrams. Load requirements can vary in each residence and it may be necessary for the installer or homeowner to make slight adjustments to the heat anticipator setting for longer or shorter cycles. It is recommended to change the setting no more than plus or minus .05 amp. at one time. Greater changes can cause the unit to rapid cycle or remain on excessively. To properly check the unit's operation, the installer should have an electrical current measuring device (0-10 amp Amprobe), air pressure measuring device (0-1.0 in slope gauge), and a temperature measuring device (0-200°F thermometer).

Install the amprobe to measure blower current, the slope gauge to measure static air pressure at the units and the temperature device to measure unit supply and return air temperature. Before taking measurements, be sure that all registers, grilles and dampers are open or are set to their proper positions. Be sure that clean filters are in place. Temperature measuring device must be installed to obtain average temperature at both inlet and outlet. For outlet, measure temperature of each main trunk at a location far enough away to avoid heater radiation and read the average temperatures.

## OPERATION AND MAINTENANCE

**1) Room Thermostat-** This is the device that controls that operation of your heating and/or cooling unit. It senses the indoor temperature and signals the equipment to start or stop maintaining the temperature you have selected for your comfort. The room thermostat should be in a central, draft free inside wall location for best operation. Do not place any heat producing apparatus such as lights, radio, etc., near the thermostat as this will cause erratic operation of the comfort system. The thermostat can accumulate dust or lint which can affect its accuracy. It should be cleaned annually.

**2) Air Filter(s)-** All central air moving comfort systems must include air filter(s). These filters will be located either in the equipment or in the return air duct system upstream of the equipment. The filter(s) removes dust and debris from the air thus helping to keep your air conditioned space clean. More important, the filter keeps dust and debris from collecting on the heat transfer surfaces thus maintaining optimum equipment efficiency and performance. Inspect and clean or replace filters every month. This routine maintenance procedure will pay big dividends in reduced operating cost and reduced service expense. Never operate comfort equipment without filter(s).

**3) Fuses and/or Circuit Breakers-** This comfort equipment should be connected to the building electric service in accordance with local and National Electric codes. This electrical connection will include over current protection in the form of circuit breakers. Have your contractor identify the circuits and the location of over current protection so that you may be in a position to make inspections or replacements in the event the equipment fails to operate.

## 4) WARNING

A) Do not store combustible materials or use gasoline or other flammable liquids or vapors in the vicinity of this appliance.  
B) Do not operate the comfort equipment with panels removed. C) Have your contractor point out and identify the various cut-off devices, switches, etc., that serve your comfort equipment. There is a main switch that will cut off energy to

**5) Periodic Checkup and Service-** This product is designed to provide many years of dependable, trouble-free comfort when properly maintained. Proper maintenance will consist of annual check-ups and cleaning of the internal electrical and heat transfer components by a qualified service technician. Failure to provide periodic checkup and cleaning can result in excessive operating cost and/or equipment malfunction.

**6) Lubrication-** Direct drive blower motors are equipped with permanently lubricated bearings and do not require further lubrication.

## LEFT HAND HORIZONTAL CONVERSION

NOTE: THE USE OF THE EXISTING HORIZONTAL DRAIN PAN ELIMINATES THE USE OF ANY DRAIN PAN KITS

- 1) To convert standard upflow air handler to left horizontal application, remove both upper/lower access panels and A-coil assembly from air handler cavity.
- 2) Place A-coil assembly inside horizontal drain pan towards left hand side and carefully slide into the air handler cavity. NOTE: Push coil pan assembly all the way to the rear of the air handler unit until the pan slips under the channel shape bracket in the rear. Reinstall upper and lower access panels in its normal position.
- 3) Condensate Drain Piping- "in all cooling applications, a secondary drain pan should be provided by the installer and placed under the entire unit with a separate drain line properly sloped and terminated in an area visible to the owner" As expressed in our product warranty, Aspen will not be billed for any structural damage due to the failure to follow this installation requirement.

## AIR FILTER REPLACEMENT

An air filter can restrict the air flow of air to the fan coil if it is not cleaned or replaced periodically. When replacing the air filter, always replace with the same type and size as originally furnished with the unit.

## PUMP REPLACEMENT

1. Disconnect electrical power to the unit before servicing.
2. Remove access door to reveal pump. Close supply valve ("A") and return valve ("B"). Open the air bleed valve to de-pressurize the system and drain water.
3. Remove the metal pump housing by loosening the four screws on the pump. DO NOT UN-SOLDER PUMP. 4. Replace the new pump housing assembly and reconnect components to the pump. Before assembling, make sure that the rubber on the o-ring is in place on the pump housing.

Purge the system of air as described earlier and reconnect the electrical power.

## COMMON PROBLEMS & SOLUTIONS

### NOISY PUMP:

System may not be totally purged of air. Purge the system again as described earlier.

### T & P VALVE ON WATER HEATER WEEPS:

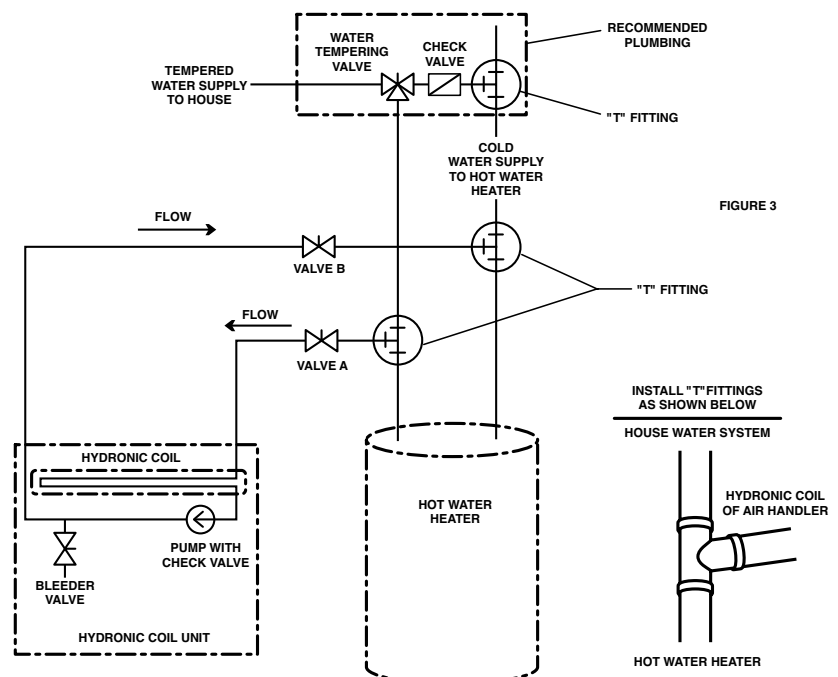
This normally occurs when a backflow preventer has been installed in the cold water line supplying the water heater. An expansion tank may be necessary to correct the problem. Contact a qualified plumbing professional for assistance.

### HOT WATER IS CIRCULATING THROUGH THE HEATING COIL DURING THE COOLING CYCLE:

The check valve may be stuck open and allowing hot water to circulate through the coil.

### LITTLE OR NO HEAT FROM WATER COIL:

- A. Purge the system.
- B. The inlet and outlet connections may be reversed at the fan coil.
- C. Water heater thermostat is not set at proper temperature.
- D. Water heater thermostat is not calibrated.
- E. The dip tube in the water heater may not be installed correctly or may be restricted.
- F. Look for restriction in heating system from water heater to fan coil. Because some water heaters are supplied with check valves, remove any extra check valves except for the one supplied with the fan coil.
- G. The air handler is undersized for the space being heated.
- H. Water heater is undersized.

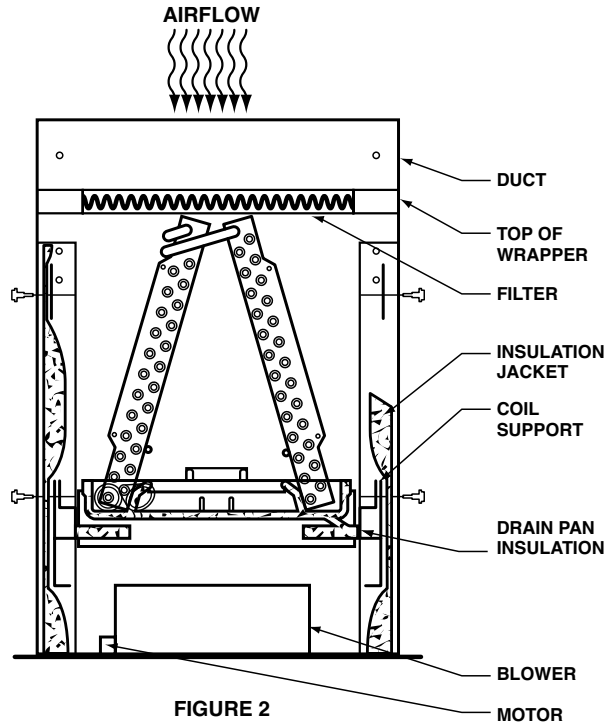


# SPECIAL INSTRUCTIONS FOR COUNTER-FLOW APPLICATIONS

## (FMW-HYDRONIC FURNACE)

The FMW Series Hydronic Furnace is specifically designed for the use in the upflow, horizontal and counterflow positions. Should the application be for counterflow position, the following steps should be taken:

- 1) Before putting the air handler in the counterflow position, remove both access panels and remove the A-coil assembly and horizontal drain pan from the air handler cavity. Horizontal drain pan is not required for counterflow applications and can be discarded.
- 2) Turn the air handler to the counterflow position and install the counterflow coil brackets.
- 3) Slide the A-coil assembly into air handler and re-install both access panels.
- 4) The "FMW" coils are shipped with a check flowrater for use with either cooling or heat pump outdoor section on each unit.
- 5) The above procedure should be done at the job site as the unit is not designed to be shipped in the counterflow mode.



## Equipment Sizing

### Air Handler Selection:

Select an air handler with a heating output that exceeds the space heating loss of the structure and that has a cooling coil sized to match the outdoor condensing unit. Special note... the heating output of the air handler or hot water coil will not be greater than the output of the selected hot water heater. Therefore, if the water heater is undersized the heating BTUH of the air handler will be LESS than its rated output.

### Water Heater Selection:

The following sizing information should only be used as a basic guide to adequate water heater sizing because of variations in each family's domestic hot water requirements. For additional assistance in water heater sizing contact a professional engineer.

Proper water heater sizing should consider both the gallon capacity AND the BTU input of the water heater.

#### a. To determine water heater GALLON CAPACITY:

A minimum 40 gallon high recovery and/or high efficiency gas or oil-fired water heater is recommended. The following volume sizing guide is satisfactory in most areas of the country:

- 600-800 CFM air handlers- minimum 40 gallon water heater
- 1000-1200 CFM air handlers- minimum 50 gallon water heater

1400-1600 CFM air handler-either two 40 gallon water heaters piped together, one high input 50 gallon (63,000 to 75,000 BTU input), or one 72 to 75 gallon. 2000 CFM air handler- any combination of water heaters having at least 105,000 BTU OUTPUT.

b. To determine water heater BTU INPUT: (assumes a water heater recovery efficiency of 76%)

For mild climates:  $BTU\ INPUT = \text{structure's heat loss} \times 1.51$

For colder climates:  $BTU\ INPUT = \text{structure's heat loss} \times 1.58$

**Note:** All units installed in Massachusetts are required to be in compliance with CMR 248 Massachusetts State Plumbing Code and/or Massachusetts Fuel Gas Code. These codes require the use of an optional pump timer to circulate the hydronic loop independent of the thermostat.