

## 18. Operation and Maintenance

Below are brief descriptions of the key components of the unit and installation. This manual only provides general idea of the components and recommended practices. The installer should use best judgement to ensure safe installation and operation of the unit.

**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 will be in a position to make inspections or replacements in the event the equipment fails to operate.



### **WARNING**

**4. 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 your heating system. Know where they are so that you may cut off the flow of energy in the event of overheating.**

**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.

**7. Air filter replacement:** An air filter can restrict the airflow 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.

## 19. AFW Hydronic Related General Information

**1. Equipment Sizing** 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. 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.

### **2. 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 (Table 19-1):

CFM	Min Water Heater
600-800	40 gal
1000-1200	50 gal
1400-1600	2x40 gallons piped together
	High input 50 gallons (63-75k Btu)
	72-75gallons
2000	105k Btu

**Table 19-1.**

- b. To determine water heater BTU INPUT (assumes a water heater recovery efficiency of 76%): For mild climates:  $\text{BTU INPUT} = \text{structure's heat loss} \times 1.51$ . For colder climates:  $\text{BTU INPUT} = \text{structure's heat loss} \times 1.58$ .

### **3. Pump Replacement**

- Disconnect electrical power to the unit before servicing.
- 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.
- Remove the metal pump housing by loosening the four screws on the pump. DO NOT UN-SOLDER PUMP.
- Replace the new pump housing assembly and reconnect components to the pump. Before assembling, make sure that the runner on the o-ring is in place on the pump housing.
- Purge the system of the air as described earlier and re-connect the electrical power.

## 20. Common Problems and Solutions ---

### 1. Noisy Pump

System may not be totally purged of air. Purge the system again as described in the start up section above.

2. T&P valve on water heater weeps This normally occurs when a backflow preventer has been installed in the cold water supply line to the water heater. An expansion tank may be necessary to correct this problem. Please contact a qualified plumbing professional for assistance.

3. Hot water is circulating through the water coil during cooling cycle The check valve may be stuck open and allowing hot water to circulate through the coil.

### 4. Little or no heat from water coil

- a. Purge the system
- b. The inlet connections may be reversed at the fan coil
- c. Water heater thermostat is not set at proper temp
- d. Water heater thermostat is not calibrated
- e. Dip tube in the water heater may not be installed correctly or could be restricted.
- f. Look for restrictions in heating system from water heater to fan coil. 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 space being heated
- h. Water heater is undersized

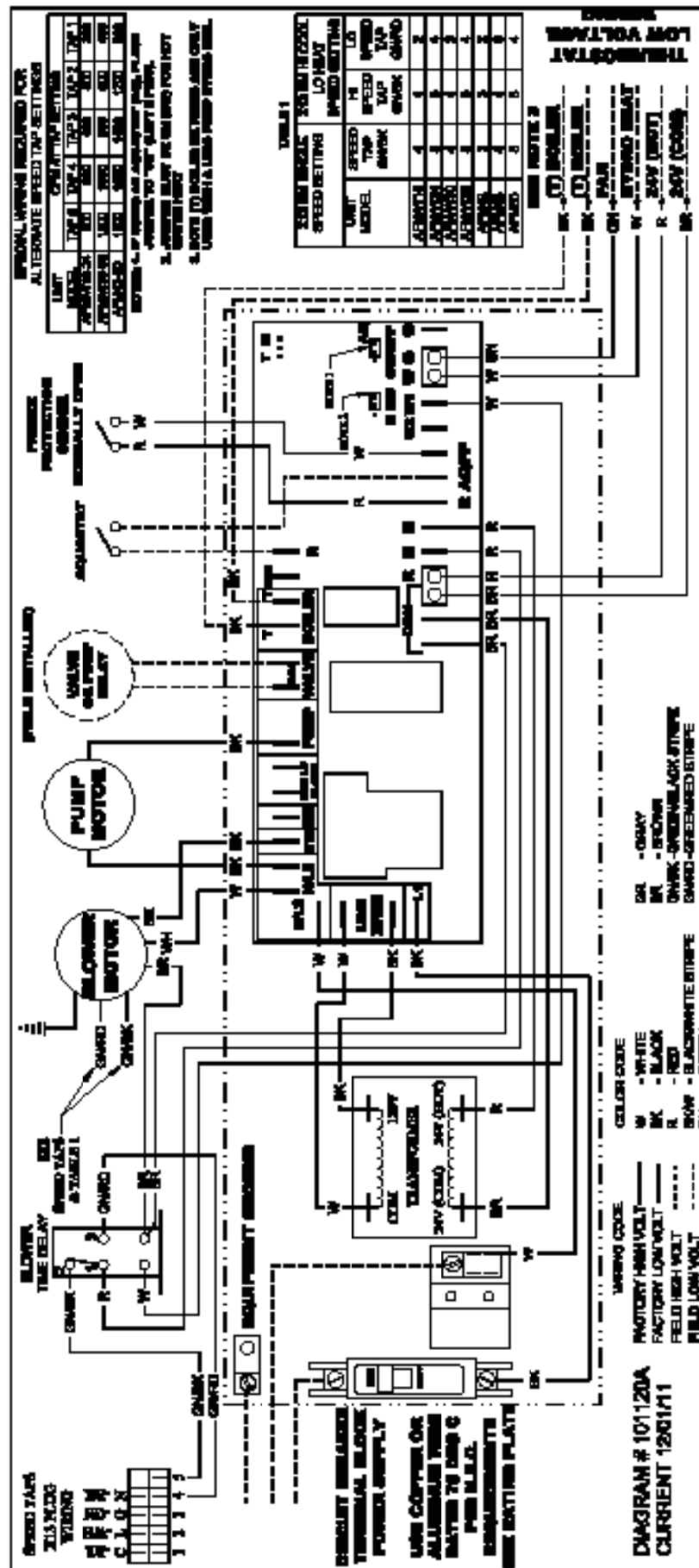
*Note: All units installed in Massachusetts are required to be in compliance with CMR 248 Massachusetts State Plumbing Code and/or Massachusetts Fuel Gas Code.*

These codes require the use of an optional pump timer to circulate the hydronic loop independent of the thermostat.

## 21. Final System Checkout ---

1. Make certain all cabinet openings are properly sealed and any grommets moved during installation are moved into proper place.
2. With cooling system operating, check for condensate leakage.
3. Perform leak detection inspection of refrigerant circuit and connecting piping.
4. Secure all cabinet doors

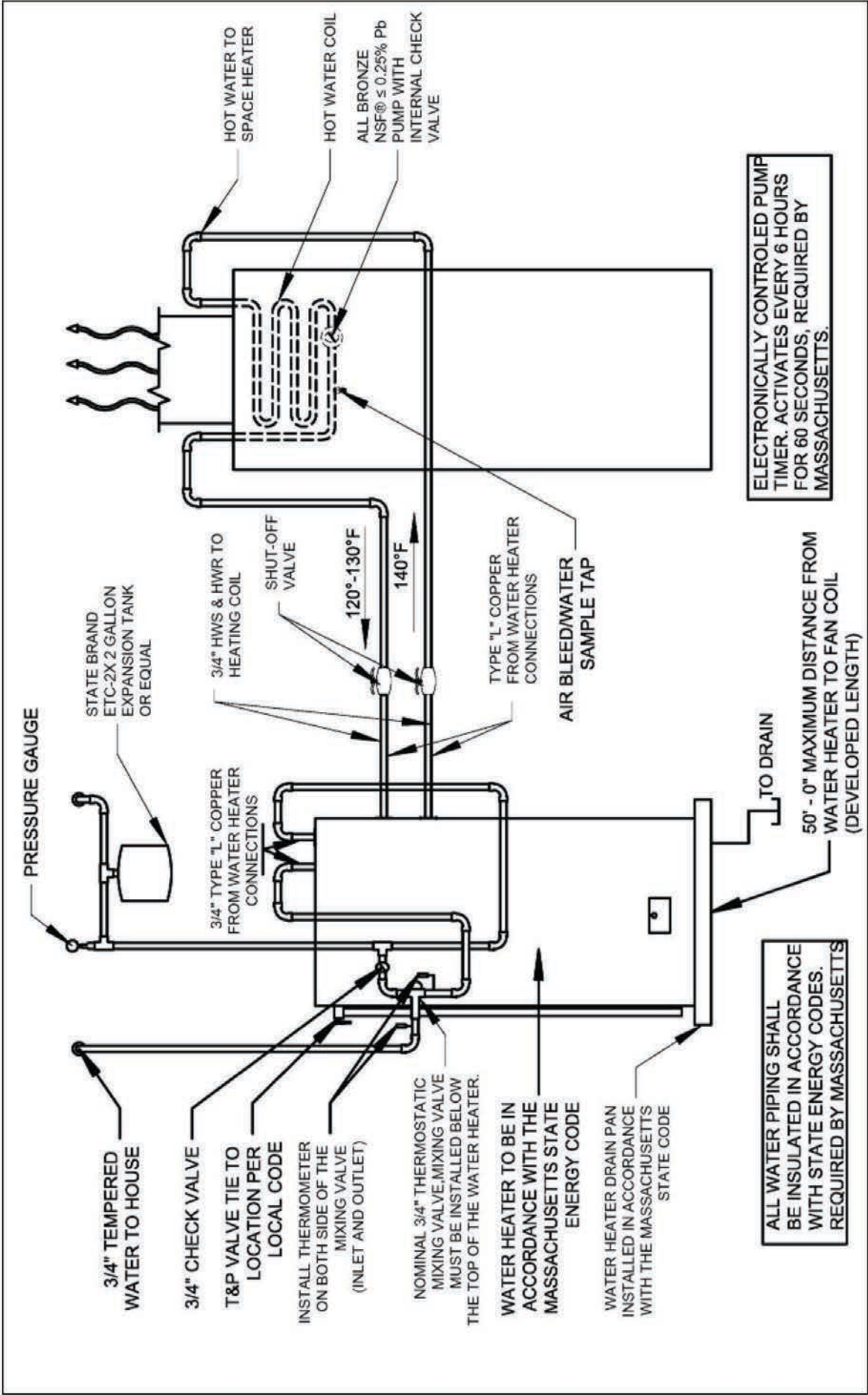
## 22. Wiring diagram for AFW models



## HIGH VOLTAGE disconnect all power sources prior to servicing. Failure might lead to safety hazard

**Fig 21-1.**

23. Massachusetts Applicable Installation Diagram



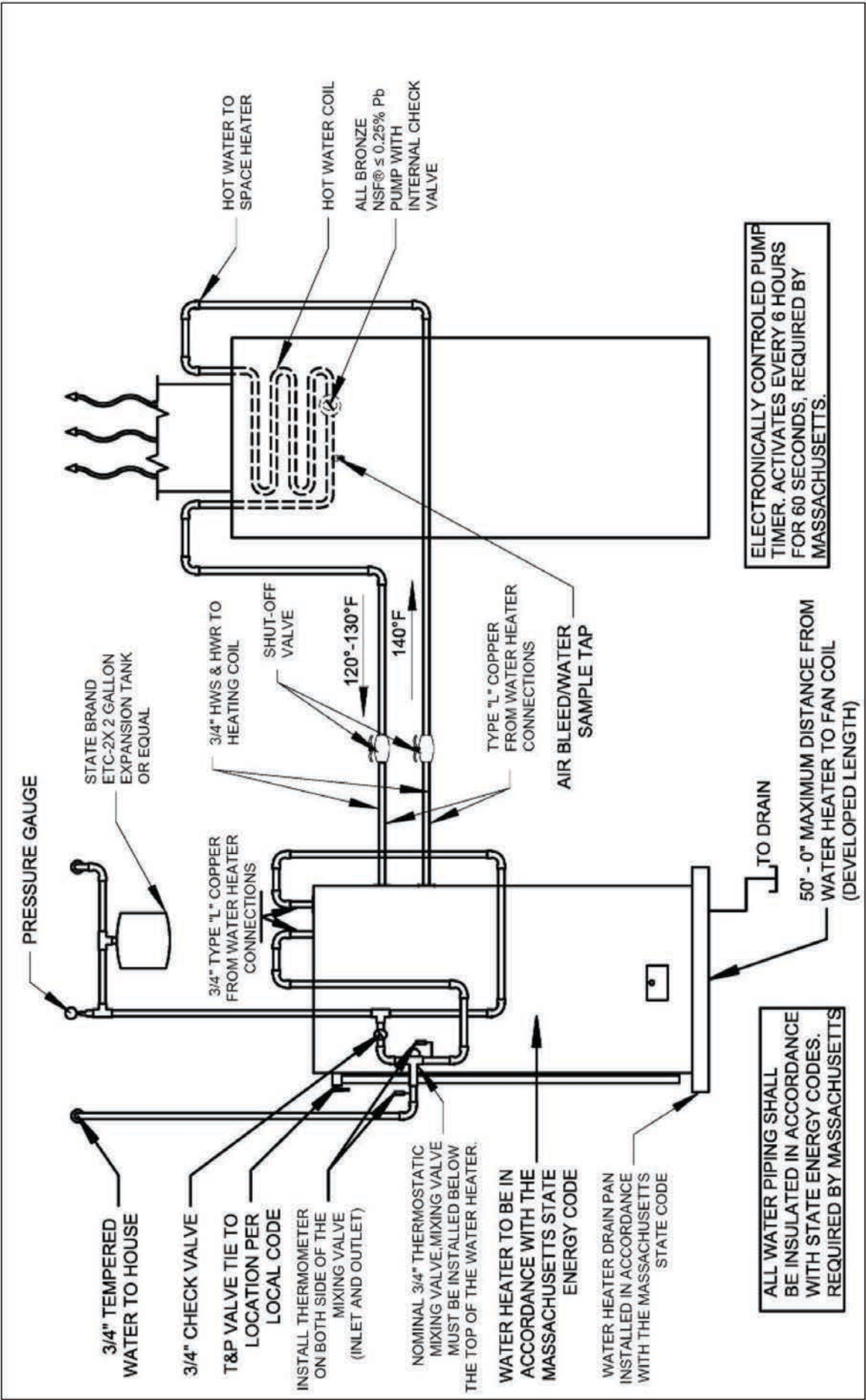
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25. Massachusetts Applicable Installation Diagram







373 Atascocita Rd.  
Humble, TX 77396  
Phone: 281.441.6500  
Toll Free: 800.423.9007  
Fax: 281.441.6510  
**[www.aspenmfg.com](http://www.aspenmfg.com)**



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