INSTALLATION AND OPERATION INSTRUCTIONS FOR THE HS TARM

AUTO-MIX II

CONTINUOUS CIRCULATION SYSTEM

PLEASE SAVE THESE INSTRUCTIONS !

GENERAL INFORMATION

YOUR NEW AUTOMIX II will regulate your house temperature more accurately than conventional controls, giving you greater living comfort while saving you money on fuel. The sophisticated, automatic Four-Way Mixing Valve arrangement makes the Automix II the ideal choice for your hot water heating system.

The Automix II regulates the release of heat from the boiler. This results in greater boiler efficiency and greater household comfort.

In a conventional hydronic (hot water) system, hot (180 deg F) water is circulated to the home whenever the thermostat calls for heat. Once the demand for heat is satisfied, the thermostat then turns off the circulator. In the Automix II system, however, water of a varying temperature flows continuously through your baseboard heaters (or radiators).

When your thermostat calls for heat the Four-Way Mixing Valve adds more hot water from the boiler to the water circulating to the house. When your house is warm enough, the valve closes down, and less hot water is mixed in. The position of the valve determines the proportion of hot boiler water to he mixed with the water already circulating through the radiation loop.

The AUTOMIX II has many advantages over conventional systems, such as:

A MORE COMFORTABLE HOME because constant circulation provides your family with even heat. Rather than turning completely on or off, the heat is always "on". The Automix II responds automatically to changes in heating demand.

LONGER BOILER LIFE by reducing thermal shock. Each time a circulator pump turns on, a large volume of cold water is returned to the boiler, reducing boiler water temperature and retarding the fire by cooling the firebox walls and heat exchanger. The Automix II eliminates thermal shocks to your boiler and associated boiler and fuel inefficiencies by tempering the water being returned to the boiler.

LONGER CIRCULATOR LIFE, as most wear in circulators is due to motor start-up.

BETTER PERFORMANCE AND GREATER COMFORT FROM CAST-IRON RADIATORS. In your Automix II system, there is no waiting for large, heavy cast-iron radiators to heat up with hot water.

INCREASED FUEL EFFICIENCY AND SAVINGS. Having much the same effect as pumping the accelerator of a car, surges of heat required from conventional systems increases fuel consumption and decrease fuel efficiency. Your Automix II eliminates the costly short cycling and promotes smooth, even burns and, with solid fuels, longer burn times.

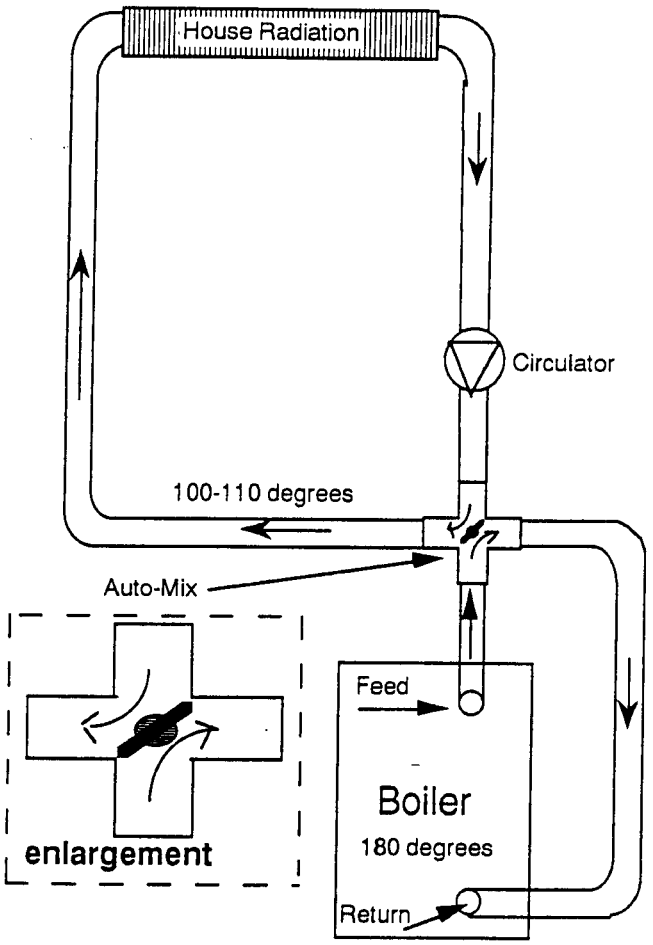
A QUIETER HOUSE during the heating season. Sudden changes in water temperature cause radiators and baseboard heaters to expand and contract noisily. Keeping radiation temperatures relatively consistent, your Automix II eliminates annoying clanks and rattles.

PLENTY OF HOT TAP WATER The Automix II spreads out the demand for heat--thereby allowing the boiler to stay at a higher temperature. The result is a more domestic hot water production for household use.

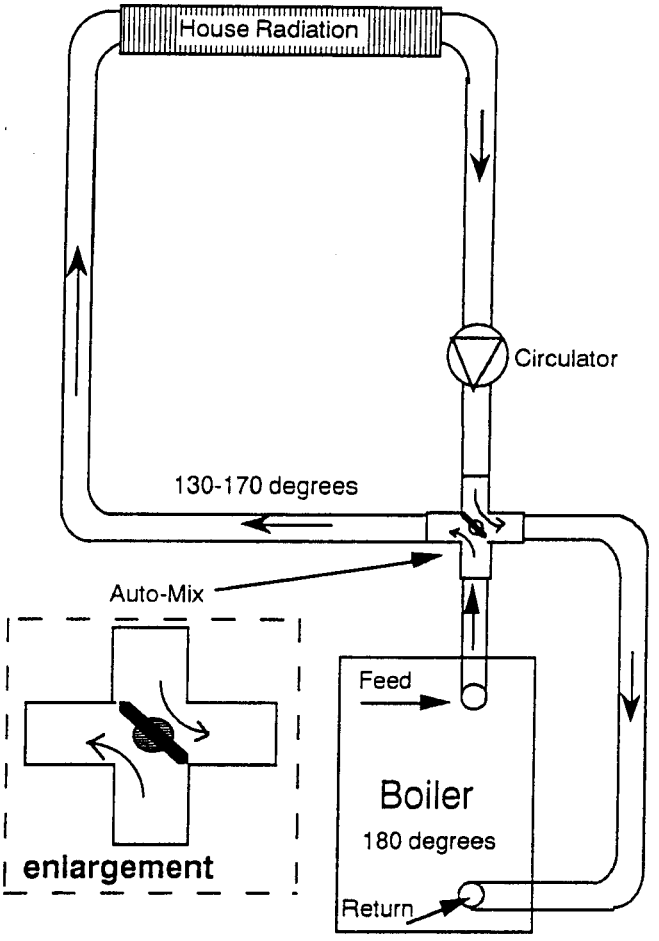
HOW YOUR AUTOMIX II WORKS

The Auto-Mix II provides a "cruise control" for your heating system. A circulator continuously will pump warm water (but not enough to overheat the area) through the home. We refer to this as the "idle" or "baseline" setting of the valve and will usually be set at around 100 degrees. When the thermostat calls for heat, the mixing valve will slowly start to open. The water in the house will reach 110, 120, 130 and so on until the thermostat is satisfied. It will then reverse slowly back to the "idle" setting. The result is an even, continuous release of heat into the living area.

The Auto-Mix II is best installed in the main or largest heating zone. Secondary zones can then be installed as in a conventional system. If desired, Auto-Mix valves can be installed in every zone.

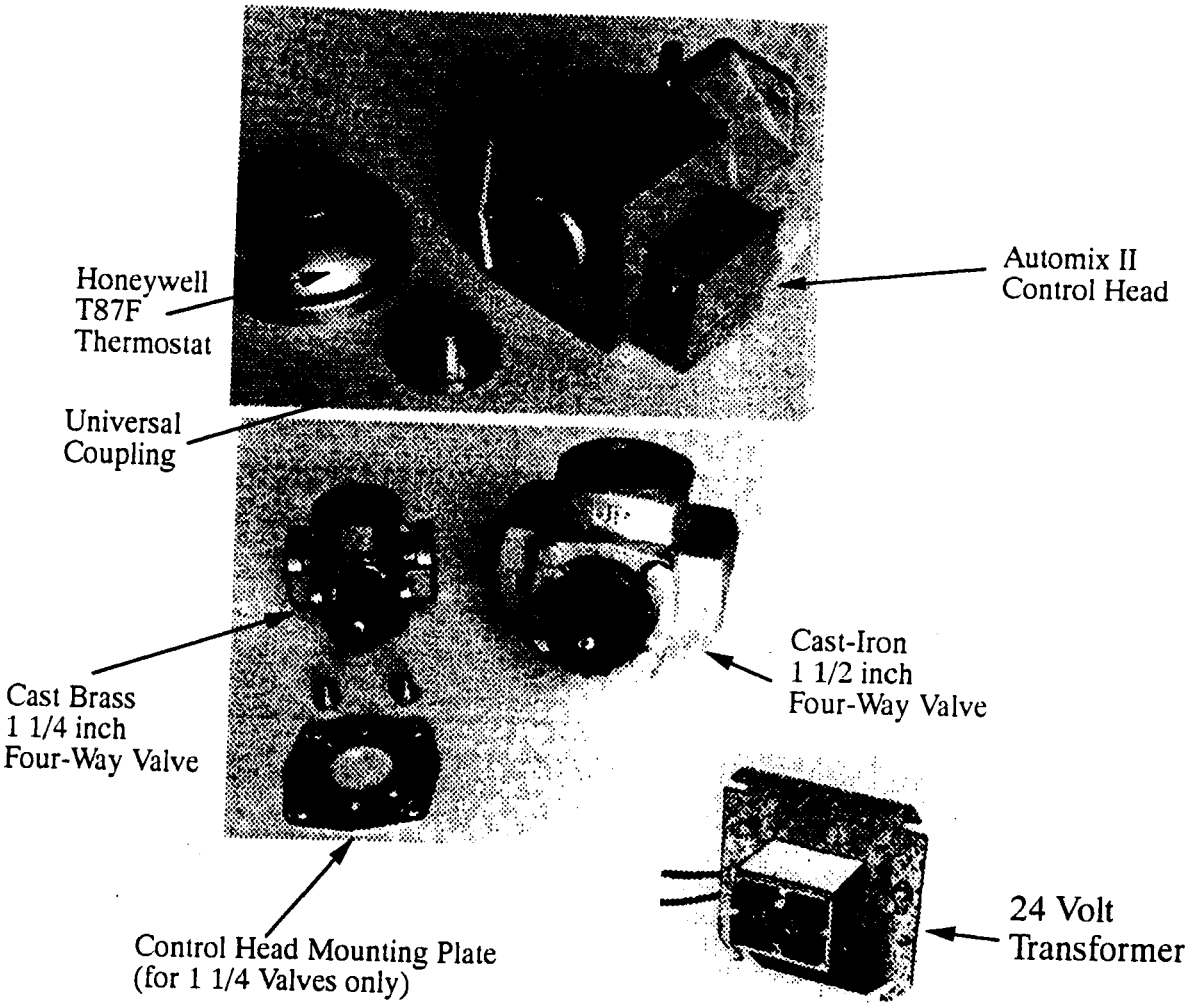


Mixing Valve Closed (Idle position)



Mixing Valve Full open

Packing List



A complete Automix II kit consists of the following parts:

1. Automix control head
2. Four way Valve (either 1 1/4" or 1 1/2")
3. Honeywell T87F Thermostat (or equiv)
4. 24 Volt Class II Transformer
5. Instruction Manual

These parts are also available separately for use when installing a custom designed system.

INSTALLATION

CHOOSING THE RIGHT SYSTEM

A) Single Zone System with Single Boiler (see diagram #1)

B) Single Zone System with Tandem Boilers. (see diagram #2)

C) Multi-Zone system with Automix Controlling Supply Water Temperatures To All Zones (see diagram #3)

The Automix is regulated by the thermostat in the primary zone,yet also controls water temperature to all other zones, as well. In practice, because smaller zones often have oversized radiation, the water temperature required by the main zone will, under most conditions, be appropriate for them, as well. This system will maximize the benefits obtained from a single Automix. The system works best if the heating requirements of the primary zone are generally in line with those of the other zones. Note: existing installations will require a significant amount of re-piping for this system.

D) Multi-Zone System with Automix Controlling Main Zone (see diagram #4)

Used in the majority of all installations, this system involves minimal repiping but still gives the homeowner the benefit of continuous, temperature controlled circulation in the main living area. This system works best if there is one large zone for the primary living area, and several smaller ones for bedrooms, baths, etc.

E) Multi-Zone System with Multiple Automixes (see diagram #5)

Although the initial installation cost of this system is high, it provides the ultimate in user comfort and fuel economy. Each zone has its own Automix, and the water supply to each living area is precisely regulated to heating demand. Option: If there are more than two zones in the home, zones of similar heating requirements may be combined as in "C", above.

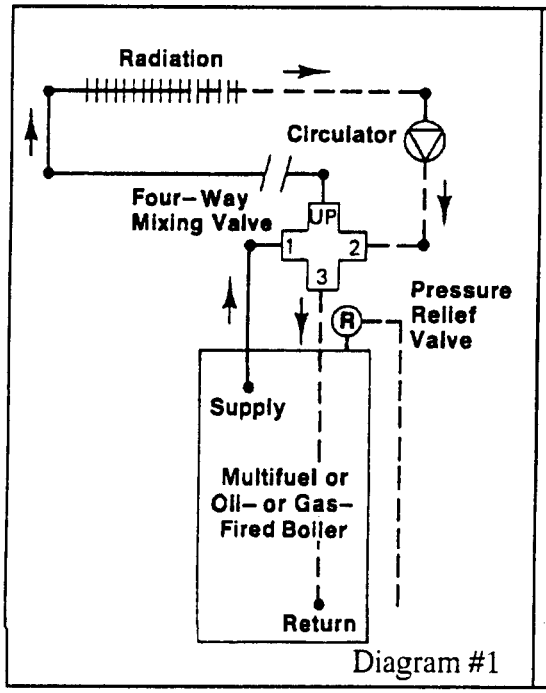


Diagram #1

Single Zone System--Single Boiler

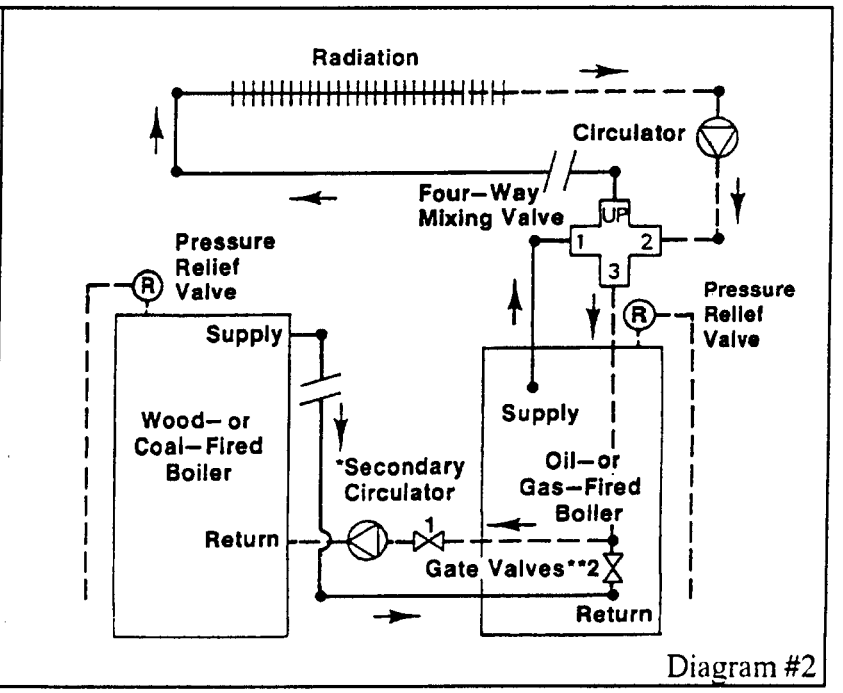
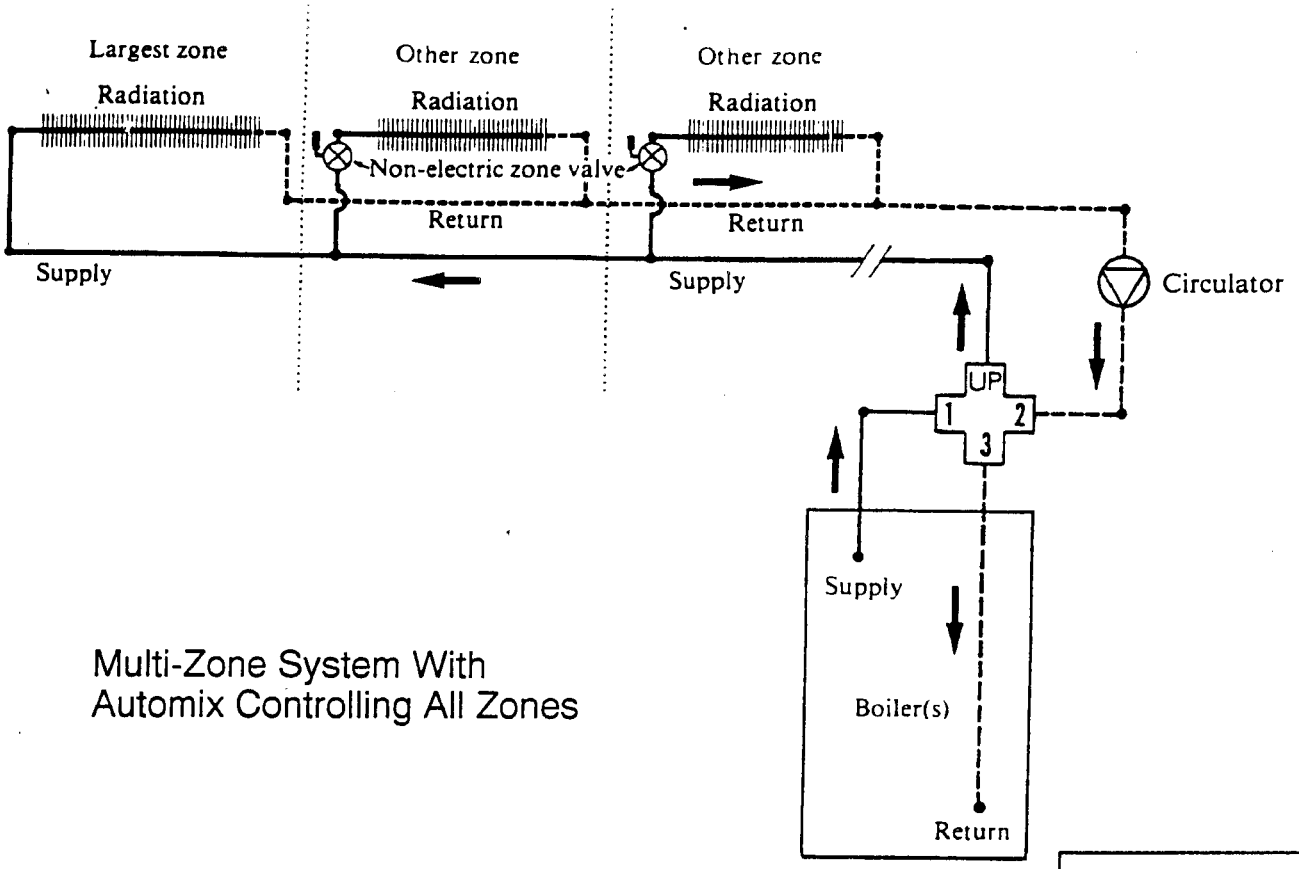


Diagram #2

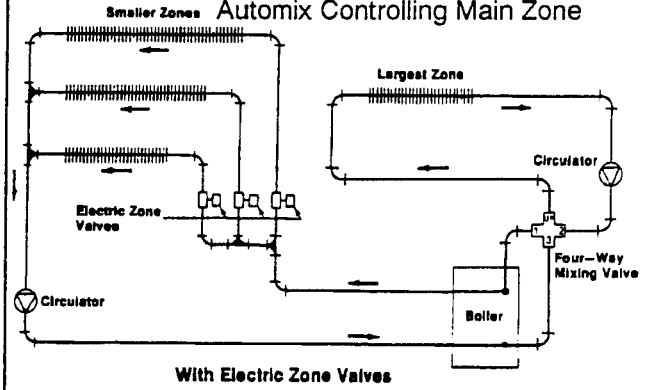
Single Zone System--Tandem Boilers



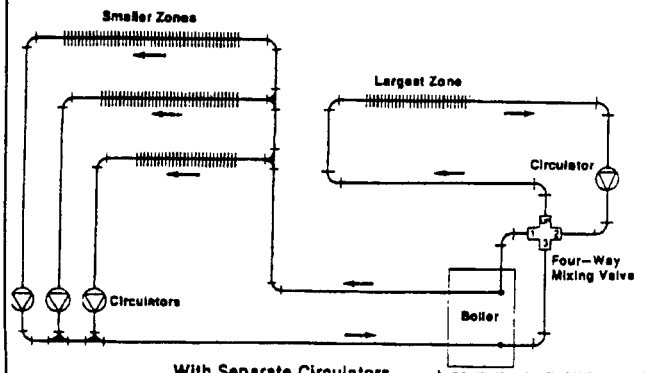
Multi-Zone System With Automix Controlling All Zones

Diagram #3

Multi-Zone Systems With Automix Controlling Main Zone

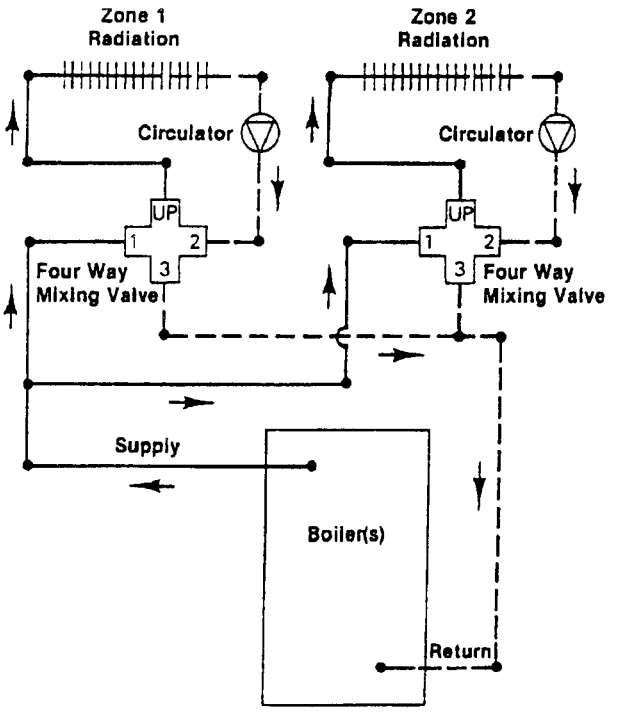


With Electric Zone Valves



With Separate Circulators

Diagram #4



Multi-Zone System w/Multiple Automixes

Diagram #5

CONNECTING THE FOUR WAY MIXING VALVE TO THE BOILER.

Position the valve so that it is supported by piping to sit at least several inches behind and above the top rear of the boiler. When viewed from the front of the boiler the valve should be positioned so that "UP" should point to the left or point up. The positioning will be determined by location of existing piping and ease of installation. In all circumstances the connections to the Four Way Mixing Valve must be as follows-

Tapping marked 'UP' - to radiation supply

Tapping marked '2' - to radiation return

Tapping marked 'l' - to boiler supply

Tapping marked '3' (unmarked on 1-1/2") - to boiler return

a) Circulator - The circulator for the Automix loop should be positioned in the radiation supply or radiation return line, close to the mixing valve. The circulator will be wired to a standard SPST switch so that it can run continuously through the winter and shut off during the summer.

b) Zone valves and flow check valves must not be installed in the Zone controlled by the Automix. Such a valve will prevent dissipation of excess heat to the house in the event of the boiler overheating. Zone valves can be installed in parallel on multizone systems as in diagram #5.

INSTALLING THE AUTOMIX II CONTROL HEAD

l) Remove the black knob on the mixing valve and save the screw.

2a) 1-1/2" mixing valve (C40) only

- remove the top right and lower left bolts on the face of the mixing valve.

2b) 1-1/4" mixing valve (C32) only

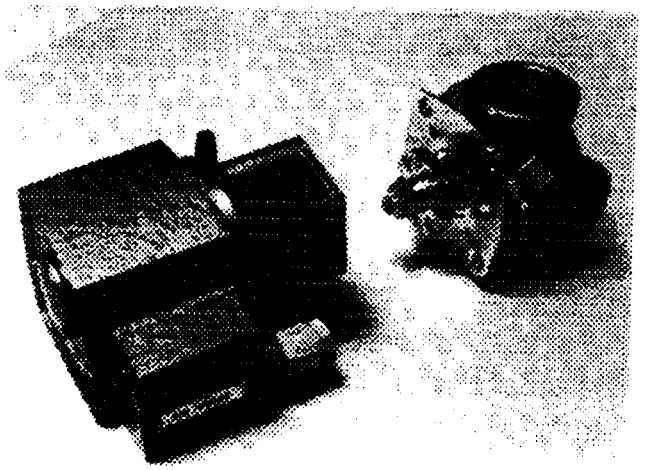
- remove the two small bolts on the valve and use them to attach the adaptor plate supplied with the valve to the valve. The upper edge of the adaptor plate must be horizontal, not at an angle.

3) Attach the silver universal coupler (supplied with the Automix II control head) to the valve shaft, using the screw from step #1. Turn the valve shaft fully counterclockwise.

4) With the Auto Mix II in the position shown in the photos on the next page, tighten the black Quadrant screw in the 12 o'clock position.

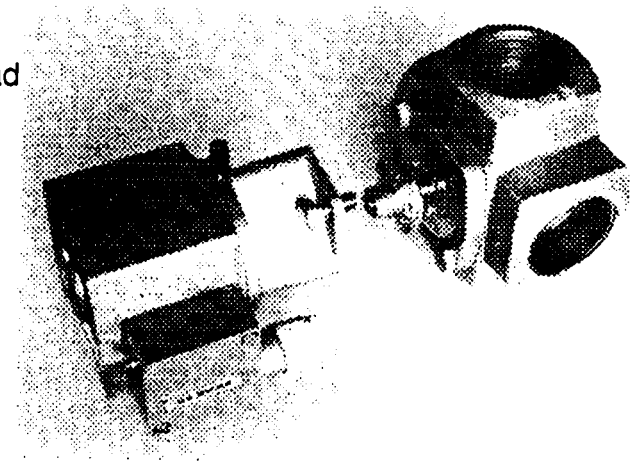
5) Maintaining the control head in the same orientation, fit it to the mixing valve. Make sure the Automix II is properly coupled with the valve, and attach it with the two bolts (removed in step #2 on the 1-1/2" valve (C40)s supplied loose with the adaptor plate on the 1-1/4" (C32) valve). To make sure the valve is properly assembled, loosen the black quadrant screw and move it counterclockwise (to the left). It should only move a short distance before meeting resistance. When the valve is cold and the locking screw is in the 12 o'clock position the indicator on the control head dial should point below "O" Note: When hot boiler water has warmed up the mixing valve the indicator on the control head dial will read a minimum setting of "O" or above.)

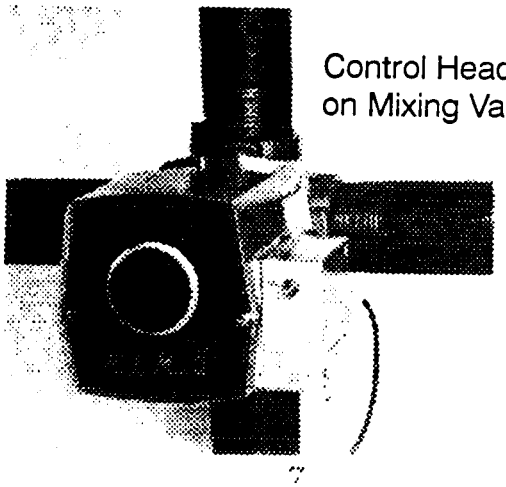
6) Return the locking screw to the 12 o'clock position for normal operation.



Mounting Control Head
to 1 1/4 (C32S)
Mixing Valve

Mounting Control Head
to 1 1/2" (C40)
Mixing Valve





Control Head Assembled
on Mixing Valve

WIRING

The Automix II control head operates on 24 VAC (Class II 24 Volt transformer). The head is controlled by a 24 volt Honeywell thermostat (T87F or equiv.).

Complete the wiring as per the diagrams. Diagram #1 is for use with a triple aquastat relay. Diagram #2 is for direct wiring to the thermostat.

If the boiler is equipped with an overheat Aquastat (solid fuel boilers) the Aquastat should be wired to the the Automix Zone as per the diagrams.

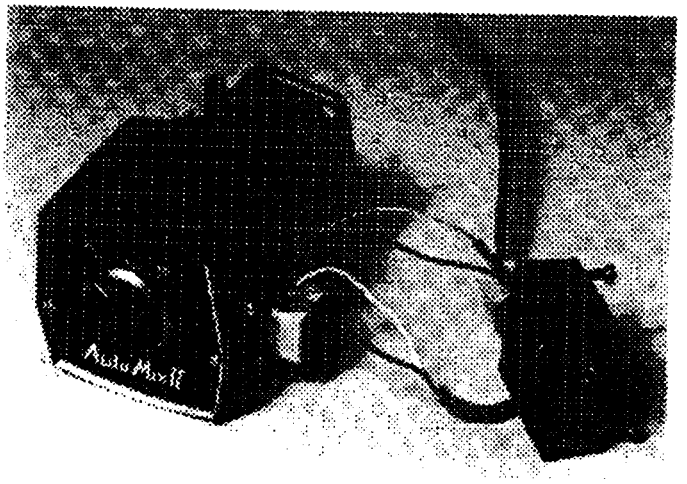
The following steps are for wiring the ceramic heating resistance element and Indicator lamp.

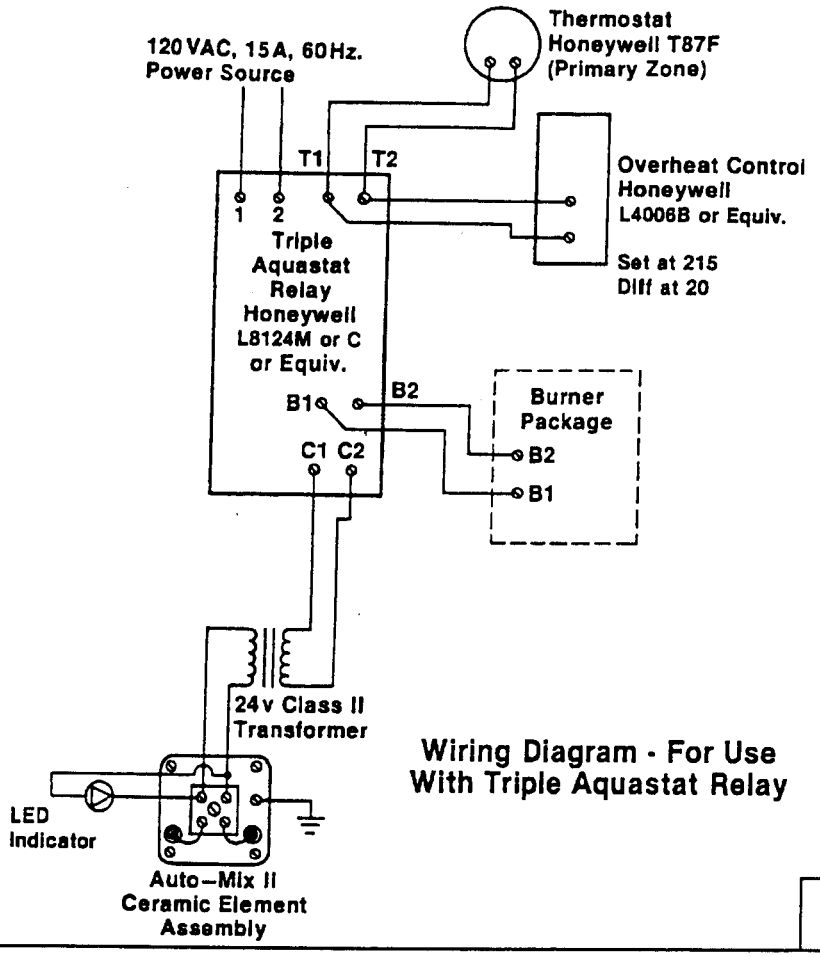
l) Remove the cover from the ceramic element assembly on the control head.

2) Screw the plastic wire clamp tightly into the tapped hole on the cover of the assembly. Run 3 wires - 2 for the ceramic element (24 volt) and 1 for the ground through the clamp. Connect one wire from the indicator lamp and one 24 VAC wire to one of the upper terminals on the terminal block. Connect the remaining lamp wire and 24 VAC wire to the remaining upper terminal. The indicator lamp must be wired in parallel and with the element.

3) Attach the third wire to the grounding screw on the metal base.

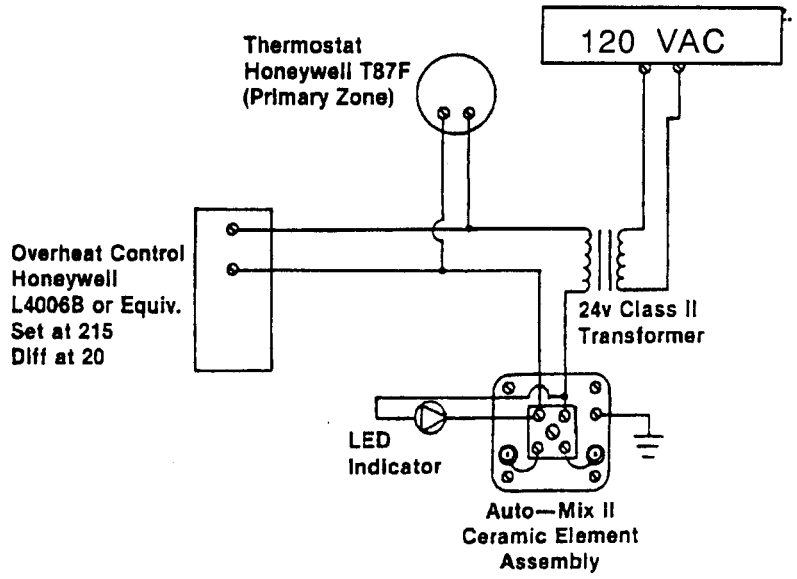
4) Tighten the plastic clamp on the wires, then replace the cover.





Wiring Diagram - For Use With Triple Aquastat Relay

DIAGRAM #1



Wiring Diagram - Independent Thermostat & Transformer

DIAGRAM #2

INITIAL SETTING

Thermostat

The anticipator should be initially set to 1.2 amps on the scale (see instruction with the thermostat for the location of this control and mounting instructions). During the heating season, the anticipator should be adjusted so that the thermostat calls for heat (switch on) between 6 and s times per hour on the average. If the thermostat calls for heat too frequently, lower the settings if not enough, raise the setting.

Automix II control head

The black quadrant screw (locking screw) on top of the control head is used to set the baseline mixing of boiler and radiation water. This baseline setting will ensure a minimal heat output from the boiler during periods of no demand or during power failure. In certain instances (see Homeowner Operation' section), it may be necessary to raise or lower the baseline setting by adjusting the quadrant screw manually, but in no case should the valve be set to fully-closed position.

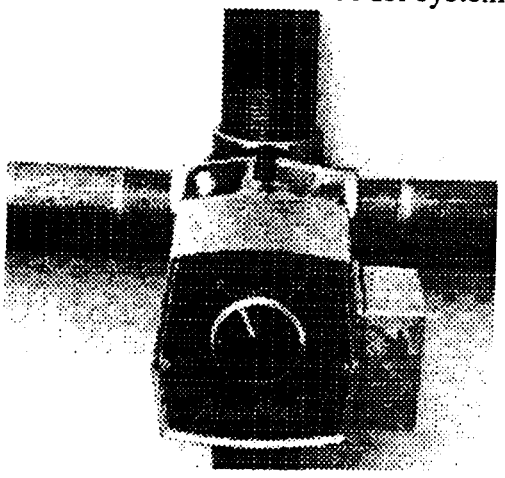
a) With the thermostat turned down, bring the boiler up to operating temperature (normally 180 F.)

b) Loosen the black quadrant screw. Move the screw to the 12 o'clock position then tighten. With the screw in this position, the dial should he slightly higher than ~O~, indicating the valve is slightly open as in the photo below.

c) Turn the thermostat to the desired temperature setting.

d) When the thermostat calls for heat the indicator lamp should turn on and the base of the control head will warm-up. The dial will open up slowly till the thermostat has been satisfied. Note: The control head moves very slowly. A complete cycle can take as long as 20 minutes.

e) For gravity circulation systems , the valve will have to he more than halfway open before the water will begin circulating in the radiation loop. The adjustment screw should be set to the halfway point or higher than it would otherwise be for systems with forced circulation.



OPERATION

Your Automix II is equipped with a control head that operates the Four-Way Mixing Valve automatically under normal heating conditions. Under certain conditions, however, it may be necessary to adjust the valve manually. The black Quadrant locking screw is used to make all such adjustments.

DURING THE HEATING SEASON

If your house is consistently cooler or warmer than the thermostat setting first check the instructions for the thermostat to make sure it is properly located. During the heating season, it may be necessary to make slight adjustments to the Quadrant setting of the control head.

To decrease the house temperature (relative to the thermostat setting) loosen the black Quadrant locking screw on top of the control head and move it slightly to the left (ie. 11 o'clock), then tighten. Moving the screw to the right (ie. 1 o'clock) will increase the temperature.

NOTE: When the screw is moved to the left, the dial should be slightly higher than "O", indicating that the valve is slightly open. NEVER MOVE THE SCREW SO FAR TO THE LEFT THAT THE INDICATOR POINTS BELOW ZERO. The valve should remain slightly open to allow hot boiler water to enter the radiation loop during a power failure and to dissipate excess heat to the radiation should the boiler overheat.

Refer to Initial setting instructions in this manual for adjustment of the thermostat anticipator.

FOR THE WARMER MONTHS

For the warmer months when your house does not need to be heated, make the following adjustments:

1) Using the manual switch, turn off your circulator(s).

2) Adjust the Quadrant on the control head by loosening the black quadrant locking screw. Move the screw as far to the left as it can go, then tighten.

Be sure to reverse this procedure when the heating season begins in the fall.

PROCEDURE IN THE EVENT OF A POWER FAILURE.

Should the thermostat circuit become inoperative, or in the unlikely event that the ceramic heating element should fail, the Four-Way Mixing Valve will close to a minimum setting as determined by the position of the quadrant locking screw on the control head. Even if the valve has been set per the instructions in "Initial Setting" the temperature in the house will begin to drop. In this case, the valve must be adjusted manually as follows.

1) Loosen the Quadrant locking screw. For more heat, move the screw to the right and tighten. If the house gets too hot adjust the screw to the left and tighten.

2) Open all flow-check valves in your heating system. (gravity circulation systems do not have flow-check valves and will continue to operate normally without electricity.)

3) If you are burning solid fuel, DO NOT LOAD LARGE AMOUNTS OF WOOD OR COAL INTO THE BOILER The draft regulator will continue to control a wood or coal fire in the absence

of electric power, but the boiler cannot dissipate a great deal of heat without the circulator(s) running. Use extreme caution in firing the boiler with wood or coal until you are able to determine how quickly the boiler can consume fuel without overheating.

When the power has returned, reset the quadrant locking screw to the normal position and tighten. Reset all flow-check valves and zone valves, and resume normal operation of the heating system.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Cannot maintain house at set temperature.	Locking quadrant set too low for weather conditions.	Reset locking quadrant on the control head further to the right.
	Thermostat in bad location.	Relocate according to the thermostat instructions.
	T-stat anticipator not set properly.	Set anticipator per instructions on page 10.
House temperature is above thermostat setting.	Locking quadrant set too high for weather conditions.	Reset locking quadrant on the control head further to the left.
	Boiler is overheating.	Follow overheat procedures in your boiler manual.
	Thermostat in bad location.	Relocate according to the thermostat instructions.
	T-stat anticipator not set properly.	Set anticipator per instructions .
Control head dial does not move, but is very hot to touch underneath.	Not enough Voltage to operate Automix.	Replace or add new Transformer. Check wiring of indicator lamp. Must be in parallel.
	Mixing Valve is Jammed internally.	Remove control head and move valve manually to check for resistance.
Control head dial does not move, and is cool underneath.	Inadequate or defec-tlve power supply.	Check for full 24 VAC across element when T-stat is calling for heat.
	Heating element in control head is bad.	Check element with ohm meter, should read approx. 18 ohms. If not, element is defective.
Mixing valve leaks.	Worn "O"-rings.	Drain system and replace

Warranty

TARM USA INC. warrants this Four-Way Mixing Valve and Auto-Mix II Control Head against any defects in material, manufacture, or workmanship for period of one year from date of installation. Any defects arising during normal use will be promptly repaired or, at Tarm USA's discretion, replaced, by any authorized HS TARM Distributor or Dealer.

The Four-Way Mixing Valve and Auto-Mix II Control Head must be installed and maintained according to the recommendations in this manual. Repairs or replacements necessitated by installation or use of these unit other than as described in this manual are expressly excluded from coverage by this Limited Warranty.

HOW AND WHERE TO GET SERVICE: Repairs or replacements under the Limited Warranty may be performed by your HS TARM Distributor or Dealer or by someone authorized by him. OTHER WARRANTIES: Except as provided by law, this warranty is expressly in lieu of all other warranties expressed or implied, including the warranties of merchantability and fitness for use and all other obligations liabilities on the part of TARM USA INC. REMEDIES: The Remedies set forth herein are exclusive, and the liability of the seller with respect to any contract of sale or anything done in connection therewith, whether in contract, in tort, under any warranty, or otherwise shall not, except as herein expressly provided, exceed the price of the equipment or part on which such liability is based.
ORIGINAL PURCHASER: This Limited Warranty applies only so long the unit is owned by the original purchaser, i.e., the person whose name is written on the Limited Warranty card or Sales Receipt.
FEDERAL, STATE, AND MUNICIPAL LAW: Notwithstanding the above this Limited Warranty shall not be construed as inconsistent with an federal, state, or municipal law or any regulations promulgated in connection herewith.

Questions regarding this Limited Warranty shall be referred to :
Tarm USA Inc., 5 Main St., Lyme, NH 03768
1-800-782-9927