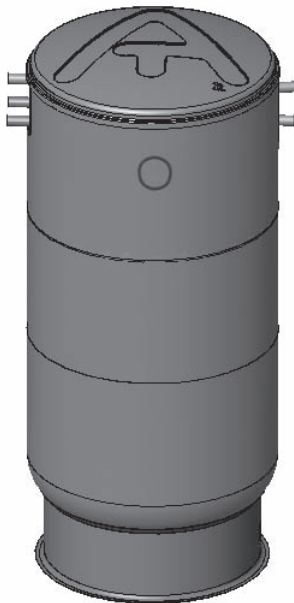


## **BOILER MATE™ TOP-DOWN INDIRECT-FIRED WATER HEATERS WITH TOP-MOUNTED COIL**



**MODELS:** TD-7Z  
TD-41Z  
TD-7ZDW  
TD-41ZDW

**WARNING** The heat transfer medium should be water. If any product other than water is used, it must be a non-toxic fluid suitable for human ingestion as determined by the FDA

**WARNING: REVIEW ALL GENERAL SAFETY INFORMATION ON PAGE 3 PRIOR TO INSTALLATION.**

Your AMTROL BOILER MATE™ has been carefully assembled and factory tested. To enjoy the full service your BOILER MATE™ can provide, you should read and follow all of the instructions in this manual. When all installation steps have been completed, make sure you also follow the enclosed post-installation and start-up checklists before using your AMTROL product. You should also read carefully the sections describing proper product maintenance, and follow the required procedures as you use your BOILER MATE™. Return this booklet to its original envelope, and keep it with the BOILER MATE™. **This manual may become out-of-date by later amendments. Check our web site, [www.amtrol.com](http://www.amtrol.com) or ask your AMTROL supplier for any updates relating to your product.**

Our goal is to ensure you are fully satisfied with your new BOILER MATE™. If any questions or concerns arise, call Technical Service at 401-535-1216.



**THIS IS THE SAFETY ALERT SYMBOL. IT IS USED TO ALERT YOU TO POTENTIAL PERSONAL INJURY AND OTHER HAZARDS. OBEY ALL SAFETY MESSAGES THAT FOLLOW THIS SYMBOL TO REDUCE THE RISK OF POSSIBLE INJURY AS WELL AS PROPERTY DAMAGE.**

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# 1. GENERAL SAFETY INFORMATION



**IMPORTANT GENERAL SAFETY INFORMATION - ADDITIONAL SPECIFIC SAFETY ALERTS APPEAR IN THE FOLLOWING INSTRUCTIONS**

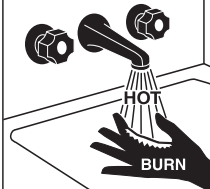
## **DANGER**

**EXPLOSION HAZARD: DO NOT INSTALL TO A HIGH PRESSURE STEAM BOILER (greater than 15 psig). AN EXPLOSION COULD OCCUR.**

## **DANGER**

**EXPLOSION HAZARD. THE PRESSURE OF THE HEAT TRANSFER MEDIUM MUST BE LIMITED TO A MAXIMUM OF 30 PSIG BY AN APPROVED SAFETY OR RELIEF VALVE ON YOUR BOILER. THE TANK PRESSURE MUST BE LIMITED TO 150 PSIG MAXIMUM BY THE INSTALLATION OF A TEMPERATURE AND PRESSURE RELIEF VALVE (INCLUDED).**

## **DANGER**



**SCALDING HAZARD: IF THE WATER TEMPERATURE IS OVER 120° F, HOUSEHOLD MEMBERS CAN SUFFER SERIOUS OR FATAL SCALDING AND PAINFUL AND PERMANENT INJURY.**

- THE CONSUMER PRODUCTS SAFETY COMMISSION RECOMMENDS AN INITIAL SETTING OF 120° F, BUT NOTES A SLOWER RESPONSE TIME OF INFANTS, AGED, DISABLED AND OTHER PERSONS INCREASES THE HAZARD TO THEM AND MAY REQUIRE LOWER SETTINGS.

- ALWAYS CHECK THE WATER TEMPERATURE BEFORE USE, INCLUDING WASHING, BATHING OR SHOWERING.

- TEMPERATURE LIMITING VALVES ARE AVAILABLE FROM YOUR PLUMBING SUPPLIER.

## **DANGER**

**SCALDING HAZARD: IF THE THERMOSTAT IS NOT WORKING PROPERLY OR IF THIS PRODUCT IS NOT INSTALLED IN ACCORDANCE WITH THE MANUAL, WATER TEMPERATURE CAN REACH EXCESSIVE LEVELS THAT MAY CAUSE SERIOUS SCALDING, EVEN IF THE TEMPERATURE SETTING IS CORRECT. AFTER INSTALLATION AND ANY SERVICING OF THE UNIT, VERIFY THAT THE THERMOSTAT IS WORKING AND FIRMLY INSERTED IN THE THERMOSTAT WELL BY FOLLOWING THE THERMOSTAT TESTING INSTRUCTIONS IN THE MANUAL AFTER INSTALLATION AND ANY SERVICING OF THE UNIT.**

## **DANGER**

**SCALDING HAZARD: A CHECK VALVE MUST BE INSTALLED IN THE BOILER RETURN LINE TO PREVENT GRAVITY FLOW THROUGH THE HEAT EXCHANGER. THIS CAN CAUSE OVER HEATING AND RESULT IN SERIOUS SCALDING.**

## **DANGER**

**IF NOT INSTALLED BY THE BOILER MANUFACTURER, INSTALL A LOW WATER CUT-OFF OR PRESSURE REDUCING VALVES MUST BE INSTALLED ON YOUR BOILER SO THAT LEAKING FROM ANY PLUMBING FIXTURE WILL NOT RESULT IN A DRY BOILER; IF THE BOILER CONTINUES TO FIRE, AN EXPLOSION HAZARD EXISTS.**

## **DANGER**

**THIS UNIT MUST BE INSTALLED AS A SEPARATE HEATING ZONE. DO NOT CONNECT THIS UNIT TO AN EXISTING HEATING ZONE OR FEED BOILER WATER DIRECTLY THROUGH THE COIL AS DANGEROUS OVER-HEATING WILL RESULT.**

## **CAUTION**

**DO NOT DRAIN THIS APPLIANCE BEFORE SHUTTING OFF THE SUPPLY VALVE AND OPENING THE RELIEF VALVE OR ANOTHER DOWNSTREAM FIXTURE, AS IT WILL DAMAGE THIS UNIT. ALSO, MAKE SURE A VACUUM BREAKER IS IN PLACE TO AVOID DAMAGING THE LINER.**

## **WARNING**

**AVOID RISK OF INGESTING A TOXIC FLUID. THE HEAT TRANSFER MEDIUM SHOULD BE WATER. IF GLYCOL MUST BE USED, IT SHOULD ONLY BE USED WITH DOUBLE-WALLED HEAT EXCHANGERS.**

## **WARNING**

**THIS TANK, LIKE MOST TANKS UNDER PRESSURE, WILL OVER TIME CORRODE OR FAIL AND/OR MAY BURST AND/OR LEAK OR FLOOD (AND IN RARE CASES EXPLODE) WHICH CAN CAUSE SERIOUS OR FATAL PERSONAL INJURY AND PROPERTY DAMAGE. TO MINIMIZE RISK, A LICENSED PROFESSIONAL MUST INSTALL AND PERIODICALLY INSPECT AND SERVICE THE UNIT. A DRIP PAN, CONNECTED TO AN ADEQUATE DRAIN MUST BE INSTALLED IF LEAKING OR FLOODING CAN CAUSE PROPERTY DAMAGE.**

## **CAUTION**

**AS IN ALL PLUMBING PRODUCTS AND WATER STORAGE VESSELS, BACTERIA CAN GROW IN YOUR BOILER MATE™, ESPECIALLY DURING TIMES OF NON-USE. CONSULT YOUR LOCAL PLUMBING OFFICIAL REGARDING ANY STEPS YOU MAY WISH TO TAKE TO SAFELY DISINFECT YOUR HOME'S PLUMBING SYSTEM.**

## **WARNING**

**WATER QUALITY CAN SIGNIFICANTLY INFLUENCE THE LIFE OF YOUR PRODUCT, YOU SHOULD TEST FOR CORROSIVE ELEMENTS, ACIDITY, TOTAL SOLIDS, AND OTHER RELEVANT CONTAMINANTS, INCLUDING CHLORINE AND TREAT YOUR WATER APPROPRIATELY TO INSURE SATISFACTORY PERFORMANCE AND PREVENT PREMATURE FAILURE.**

## **WARNING**

**FOLLOW ALL OF THE INSTRUCTIONS AND RECOMMENDATIONS CONTAINED IN THIS MANUAL, AND THE FOLLOWING ADDITIONAL SPECIFIC WARNINGS. FAILURE TO DO SO IS UNSAFE AND CAN CAUSE SERIOUS SCALDING, EXPLOSION, SERIOUS OR FATAL PERSONAL INJURY AND PROPERTY DAMAGE.**

**FAILURE TO FOLLOW THE ABOVE WARNINGS MAY RESULT IN SERIOUS OR FATAL PERSONAL INJURY AND/OR PROPERTY DAMAGE, AND WILL VOID THE WARRANTY.**

## 2. PRE-INSTALLATION CHECKLIST

### IMPORTANT STEPS AND DECISIONS REQUIRED BEFORE INSTALLATION

⌋ THIS PRODUCT MUST BE INSTALLED AND MAINTAINED BY A LICENSED PROFESSIONAL. IN ADDITION TO THE INSTRUCTIONS IN THIS MANUAL, FOLLOW ALL APPLICABLE LOCAL AND STATE CODES OR IN THE ABSENCE OF SUCH CODES, THE CURRENT EDITIONS OF THE NATIONAL PLUMBING CODE AND THE NATIONAL ELECTRIC CODE.

⌋ **DRIP PAN AND DRAIN:** To avoid leaking and/or property damage, install with a drip pan connected to an adequate working drain kept clear at all times.

⌋ **CAUTION:** Determine whether your water is corrosive or acidic, and that there are no suspended solids, toxic or other substances or abnormally high chlorine levels in the water that could damage or affect the BOILER MATE™ or the rest of your plumbing system.

**⚠ WARNING** Do not locate this product where leaking and flooding could cause damage to surrounding property.

**⚠ WARNING** USE GLYCOL ONLY WITH DOUBLE-WALLED HEAT EXCHANGER MODELS. Glycol is a hazardous substance. To avoid seepage or leakage of glycol to surfaces where children or animals can ingest it, use glycol only in double-walled units, so that any leaks will most likely be released to the atmosphere. However, a leak to a surface area may still occur, so any use of glycol must be monitored closely and children and animals should be protected from contact with the unit.

**⚠ WARNING** Do not connect the BOILER MATE™ domestic supply with baseboard or other space heating units or elements. Any contaminants in the baseboard units will contaminate the potable water in the BOILER MATE™ and also adversely affect its performance.

⌋ **Wiring Options. Select either a Non-Priority or Priority System:**

Two options are available when wiring the controls of the BOILER MATE™ in the space heating system (boiler and distribution elements).

**1. Non-Priority System** - The controls of the BOILER MATE™ must be wired as a separate heating zone with a standard zone valve or a separate circulator dedicated to the BOILER MATE™ "zone".

**NOTICE:** In this non-priority option, the BOILER MATE™ will be supplied just as another zone. This means that if all space heating zones call for hot boiler water at the same time, the BOILER MATE™ may not be supplied with enough hot boiler water to "recover" adequately. The delivery of domestic hot water will be diminished. In many, but not all cases, this is not a problem because the routine oversizing of boiler output is adequate for both loads.

**2. Priority System** - Under this wiring option the BOILER MATE™ will be supplied before space heating.

**⚠ WARNING** In limited circumstances, space heating can be lost in the home in this priority mode. Any demand for space heating is postponed until the BOILER MATE™ has reached its set temperature. This delay in supplying the space heating zones is usually not noticed by the inhabitants of the living spaces. However, in the event of certain malfunctions such as circulator or thermostat failure, space heating could be delayed indefinitely. If undetected and uncorrected, freezing damage to piping could result.

⌋ **Select Circulator versus Zone Valve**

The flow of hot boiler water to the BOILER MATE™ can be controlled with either a motorized zone valve or a circulator.

**1. Zone valve** (system flow of 4-8 gpm). If a zone valve is to be used, a minimum flow rate of 4 gpm with all zones in use is required with a maximum of 8 gpm with only the BOILER MATE™ in use. Be sure the zone valve chosen has a maximum pressure drop (Cv = 4) when fully opened.

**2. Separate circulator.** The recommended way to provide adequate flow through the BOILER MATE™ heat exchanger is to use a separate dedicated circulator with a minimum flow rate of 4 gpm (10 feet of head minimum) and maximum flow rate of 8 gpm. This option may be used even though the heating system utilizes zone valves.

⌋ All installations require a low-water cut-off or automatic fill valve on your boiler system to reduce the risk of boiler water loss.

⌋ Steam boiler installations require a low-water cut-off which is also required by most codes.

⌋ Installation of a vacuum breaker is required to prevent damage to the BOILER MATE™ when drained.

# 3. REQUIRED COMPONENTS AND ACCESSORIES CHECKLIST

## TD-7Z, TD-41Z, TD-7ZDW, TD-41ZDW COMPONENTS CHECKLIST

The following is a checklist of components required for proper installation of these BOILER MATE™ models, both Priority and Non-Priority:

**A. Separate circulator**

- 1 each - circulator (4-8 gpm)
- 1 each - positive shut-off weighted check valve

**B. Use of heating system zone circulator**

- 1 each - zone valve

**C. Also Required:**

- 4 each - unions
- 4 each - shut off valve
- 1 each - vacuum breaker
- 1 each - T & P relief valve **(included)**
- 1 each - A THERM-X-TROL® expansion tank - **REQUIRED IF** a Back flow preventer, check valve or pressure reducing valve is installed anywhere between the BOILER MATE™ and the city main.
- As needed - pipe dope or Teflon tape
- Do not forget an EXTROL® and thermal expansion - an expansion tank is required on the boiler side of your system.

**⚠ CAUTION** If a steel hydropneumatic tank is in place, AMTROL recommends replacing it with a properly sized EXTROL® expansion tank. Otherwise, significant heat transfer problems can occur by causing air to be trapped in the heat exchanger. If the boiler system has an EXTROL® expansion tank and the boiler temperatures are being changed, resize the EXTROL® expansion tank.

# 4. INSTALLATION INSTRUCTIONS FOR FORCED HOT WATER, CLOSED HYDRONIC HEATING SYSTEMS

## A. General Installation Requirements

### 1. Do not "short circuit" the boiler

Do not connect boiler supply and return lines to the same section or in the same flow circuit in a boiler, because the boiler water returning from the BOILER MATE™ will "short circuit" and exit the boiler too cold for proper heat transfer.

### 2. Avoid high flow domestic water recirculating loops

If a recirculating loop is necessary consult applicable Code requirements. A flow of no more than 1/2 gpm is all that is generally needed for temperature maintenance at the furthest hot water fixture. Any flow greater than 1/2 gpm will result in excessive heat loss and reduction in performance.

### 3. Locating Unit

**WARNING** Do not locate this product where leaking and flooding could cause damage to surrounding property.

The BOILER MATE™ should be located in an area where water leakage from the tank or connections will not result in damage to areas adjacent to the application or to lower floors of the structure. When such a location cannot be avoided, a suitable drain pan must be installed. The pan must be connected to a drain. The installation location for this unit should also be chosen to comply with the following required and recommended dimensions for clearance and accessibility:

#### Clearance from Combustible Surfaces

This unit is design certified by the C.S.A. for installation on combustible flooring and in alcoves, closets, etc. The minimum clearance dimensions from combustible material is as follows: (See dimensions given facing units)

#### Clearance From Combustible Surfaces

LEFT SIDE .....	10"	REAR .....	1"
RIGHT SIDE.....	10"	FLOOR .....	0"
TOP .....	30"	FRONT .....	1"

#### Recommended Clearance for Servicing

LEFT .....	10"	HEAD ROOM .....	30"
RIGHT .....	10"	REAR .....	1"
FRONT.....	30"		

### 4. Instructions for reversing unit:

The unit is designed to be reversible, i.e. depending on the particular installation area, the BOILER MATE™ can be rotated 180° for easier connection to the boiler and cold water supply. All units are shipped "left-handed" with all connections (boiler, cold water supply) on the left side of the unit. If, for ease of installation, it is necessary to have the connections on the right, the following steps should be taken:

1. Carefully remove the front panel (remove top screw and unhook from stand).
2. Move the access panel/electronic control assembly to the opposite side of the BOILER MATE™.
3. Remove the ground screw from the BOILER MATE™ stand and save.
4. Proceed with electrical installation
5. Reassemble the access panel/electronic control to the BOILER MATE™.
6. Confirm that the temperature sensor is firmly inserted into the thermostat well.
7. Proceed with the installation.

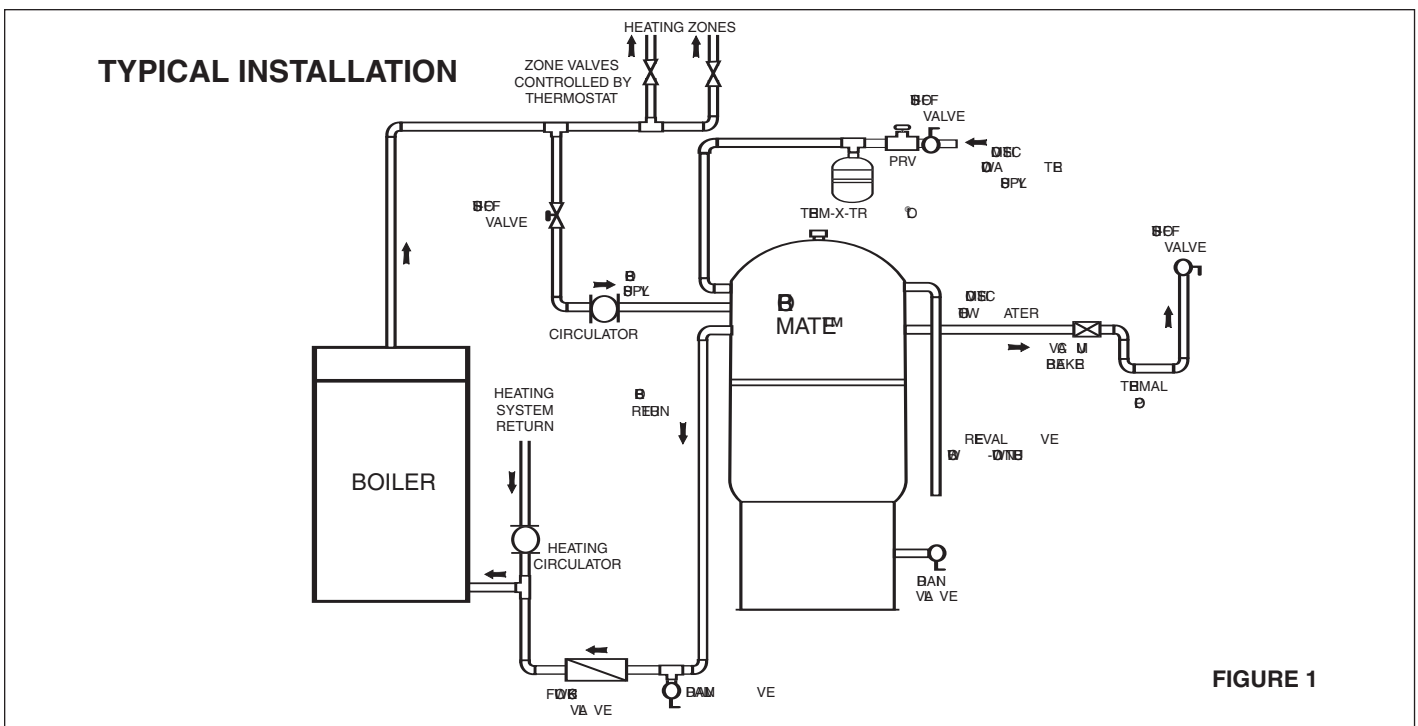


FIGURE 1

## B. PIPING

PIPING SHOULD BE ACCOMPLISHED WITH UNIONS.

**Step 1 - Locate the BOILER MATE™ near boiler.**

**Step 2 - Connect the cold water piping.**

- Shut off the cold water supply at the main shut-off valve.
- Drain existing domestic water system. Open 1 or more system faucets to prevent vacuum.
- When the system is drained, for boilers that have an external or internal tankless heater, disconnect the tankless heater from the domestic hot water piping.

### EXTERNAL TANKLESS HEATERS

Disconnect all the lines to the boiler and plug the boiler tapings. Disconnect the external heater from the domestic system piping and discard appropriately.

### INTERNAL TANKLESS COILS

**⚠ DANGER** PREVENT PRESSURE BUILD-UP IN ANY EXISTING INTERNAL TANKLESS COIL. Do not plug incoming or outgoing tapings in the internal tankless coil plate. Leave the coil in the boiler and leave system connections open, to prevent pressure build-up. (Figure 3)

- Install a shut-off valve in the existing cold water line.
- Run 3/4" or 1/2" tube and fittings from the city main, as required, to the BOILER MATE™
- If a backflow preventer, pressure reducing valve or check valve is installed anywhere between the BOILER MATE™ and the city main, install a properly sized Therm-X-Trol® pre-pressurized diaphragm-type thermal expansion tank. See the water supplier or local plumbing inspector for more information

**Step 3 - Connect domestic hot water piping Figure 5.**

**⚠ DANGER** EXPLOSION HAZARD. THE PRESSURE OF THE HEAT TRANSFER MEDIUM MUST BE LIMITED TO A MAXIMUM OF 30 PSIG BY AN APPROVED SAFETY OR RELIEF VALVE ON YOUR BOILER. THE TANK PRESSURE MUST BE LIMITED TO 150 PSIG MAXIMUM BY THE INSTALLATION OF A TEMPERATURE AND PRESSURE RELIEF VALVE (INCLUDED).

**⚠ DANGER** SCALDING HAZARD: A CHECK VALVE MUST BE INSTALLED IN THE BOILER RETURN LINE TO PREVENT GRAVITY FLOW THROUGH THE HEAT EXCHANGER. THIS CAN CAUSE OVER HEATING AND RESULT IN SERIOUS SCALDING.

- Attach the blow-down tube from the T & P valve outlet. Install the blow-down tube to within 6" of the floor. The blow-down tube should be placed so that it will discharge to a drain with adequate capacity. No reducing couplings, valves, or any other type of restriction is to be installed in this line. The blow-down tube must be installed to allow free and complete drainage of both the valve and the blow-down tube.
- Install a union, shut-off valve and vacuum breaker on the hot water outlet.

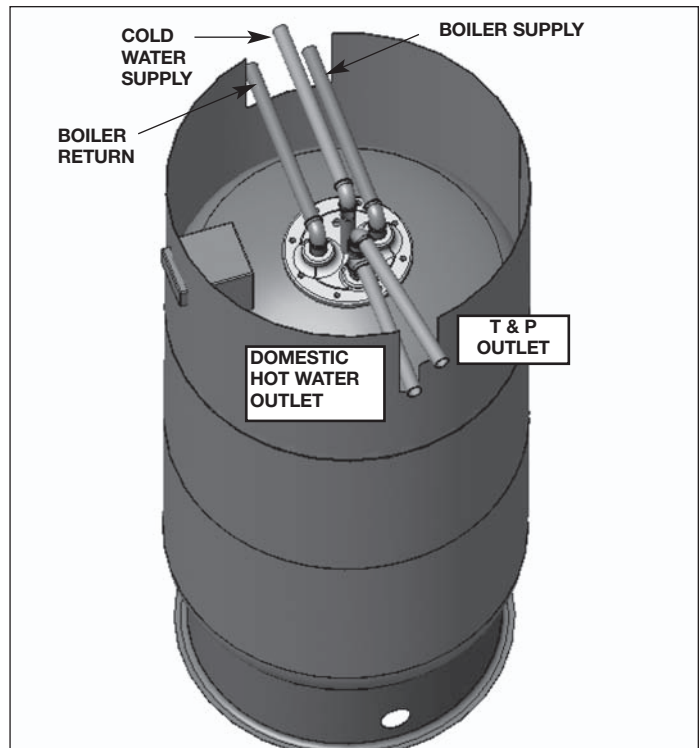


FIGURE 2

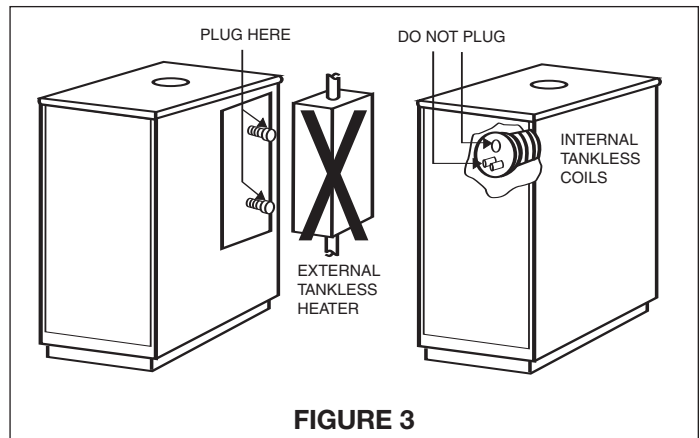


FIGURE 3

**⚠ DANGER** DAMAGE TO THE UNIT AND LEAKAGE CAN OCCUR IF A VACUUM BREAKER IS NOT INSTALLED.

- To minimize piping heat loss during non-draw periods, a thermal trap can be installed in the hot water line as shown in Figure 1.

**Step 4 - Fill the BOILER MATE™.**

- Open a hot water faucet in the house to allow any air in the BOILER MATE™ and in the piping to escape.
- Open the shut-off valve in the cold water line.
- Open the shut-off valve(s) in the hot water supply line.
- When water discharges from the faucet, close it. Check for system leaks and repair if necessary.

### Step 5 - Connect boiler supply pipe. Figure 1.

- Shut off the cold water supply valve to the boiler, and drain it using a hose attached to the drain valve at the boiler.
- When the boiler system piping is drained, cut the piping to accommodate the supply line tee. Install the tee between the boiler supply outlet and any system zone valve or flow check.
- Connect the circulator flange and mount the circulator to the boiler supply. **Be sure the flow arrow points towards the BOILER MATE™.** Mount the second flange to the circulator.
- Connect a 3/4" NPTM to a 3/4" sweat adapter to the second circulator flange.
- Using short lengths of tubing, connect the 3/4" shut-off valve.
- Run the 3/4" copper tubing with necessary fittings to the point of connection to the boiler supply tee.

### Step 6 - Connect boiler return pipe. Figure 1.

- Connect the 3/4" NPT, boiler return fitting and connect the drain valve and union.
- Sweat a short length of tubing to the adapter and connect the weighted check valve with the flow towards the boiler (preventing flow towards the BOILER MATE™). Failure to do so will result in the BOILER MATE™ overheating.
- Run the 3/4" tubing and fittings as required to the point of connection to the boiler return.

NOTE: This point must be between the boiler return tapping and any system circulator(s). Failure to do so will result in the BOILER MATE™ overheating.

### Step 7 - Refill the boiler system

- Open the cold water supply valve to the boiler.
- Check for system leaks.
- Close the weighted check valve on the boiler return piping of the BOILER MATE™
- Open the drain valve on the boiler return line to release entrapped system air.
- Close the drain valve
- Open the weighted check valve.

## C. ELECTRICAL WIRING

All wiring must be in accordance with local codes, regulations, and ordinances or, in the absence of such codes, the National Electrical Code ANSI/NFPA No. 70, latest edition.

The BOILER MATE™ thermostat is packaged separately and is installed by sliding the capillary tube into the thermostat well.

**⚠ DANGER** Electrocutation hazard. First dis-connect all electrical power before doing any electrical work.

**⚠ DANGER** Electrocutation hazard. The BOILER MATE™ must be electrically grounded.

**⚠ WARNING** Electrical supply must come from the boiler side of boiler's emergency shut-off switch in order to prevent unsafe boiler operation.

## SEPARATE CIRCULATOR

### I. BOILER MATE™ as Separate Zone - Non-Priority

#### A. Use of separate BOILER MATE™ ZONE CIRCULATOR

##### Step 1 - Disconnect electrical power.

- Turn off the boiler service switch.
- Turn off the safety switch (if separate from the service switch).
- Switch off the branch circuit breaker.

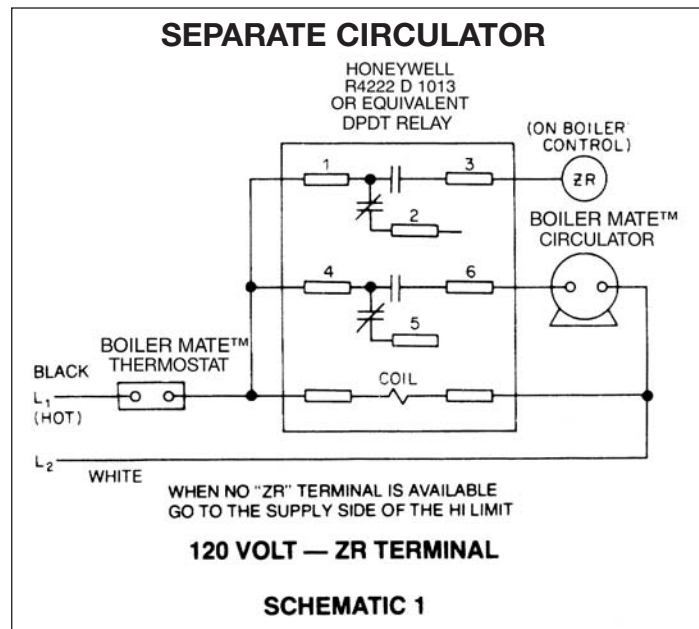
##### Step 2 - Remove electrical box cover on Thermostat.

##### Step 3 - Wire BOILER MATE™ using Schematic #1 or #2.

- Install BX connector.
- Insert outside wiring to BOILER MATE™ through electrical conduit opening on thermostat.
- Complete exterior electrical wiring per Schematic #1 or #2.

##### Step 4 - Turn boiler low-limit control (it is part of the boiler control) to the off position.

**Note:** Some boilers require minimum setting of low limit.



##### Step 5 - Adjust boiler high-limit control to the desired setting. In most cases 180° F to 200° F is acceptable.

##### Step 6 - Re-assemble electrical box cover.

##### Step 7 - Re-connect electrical power.

#### B. Use of only the heating system circulator.

When wiring a separate zone valve, follow all steps in 1A except for Step 3c. Use Schematic #3(A, B or C) depending upon the type of zone valve. (Zone valve sizing per pg. 5)

### II. BOILER MATE™ - Priority Wiring

#### Hot Water Before Space Heating

#### A. Use of separate BOILER MATE™ zone.

A DPDT relay is to be used. Refer to Schematic #4.

##### Step 1 - Disconnect electrical power.

- Turn off the boiler service switch.
- Turn off the safety switch (if separate from



the service switch).

c. Switch off the branch circuit breaker.

**Step 2** - Remove electrical box cover.

**Step 3** - Remove existing wire from boiler aquastat terminal C1 and connect to terminal #2 on DPDT relay.

**Step 4** - Install wire from DPDT relay terminal #1 to boiler aquastat terminal C1.

**Step 5** - Connect terminals of 4 and 6 of DPDT relay "T" terminals of boiler aquastat relay.

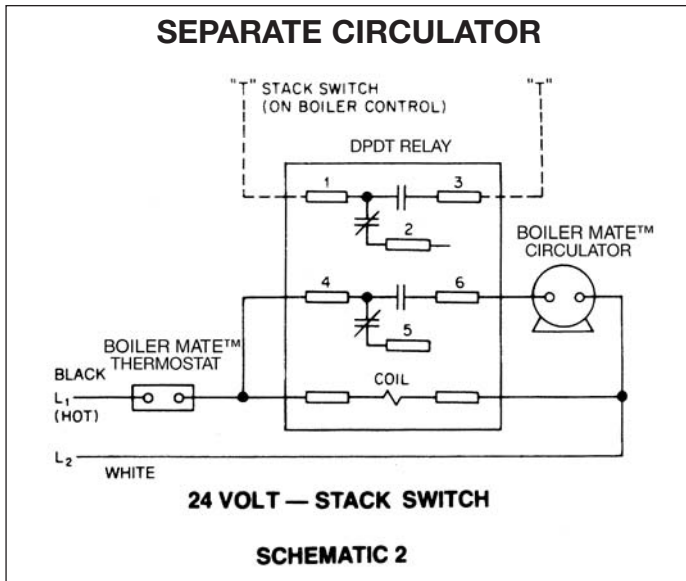
**Step 6** - Connect BOILER MATE™ thermostat to L1, BOILER MATE™ and DPDT relay as shown in Schematic #4.

**Step 7** - Connect L2 to BOILER MATE™ circulator and DPDT relay as shown in Schematic #4.

**B.** Use only the heating system circulator.

When wiring a separate, full-flow 3-way zone valve, follow steps in 1B. above.

**Note:** Priority comes from the valve operation and not the wiring.



## D. POST-INSTALLATION and START-UP CHECKLIST

After the BOILER MATE™ has been plumbed and wired, it is now ready to be set for automatic operation. Turn on the boiler and safety switches.

## TEMPERATURE ADJUSTMENT

**⚠ DANGER** PAINFUL SCALDING WITH POSSIBLE SERIOUS AND PERMANENT INJURY CAN OCCUR IF THE TEMPERATURE IS SET TOO HIGH OR THE THERMOSTAT IS NOT FUNCTIONING PROPERLY.

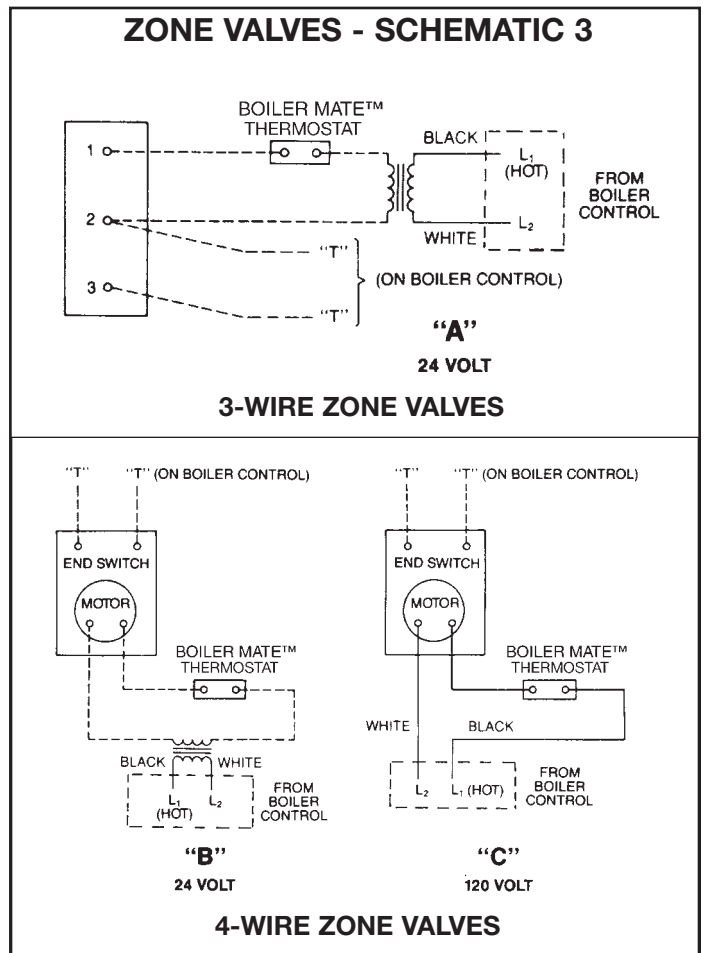
The thermostat controls the maximum water temperature in the BOILER MATE™. If set too high, the resulting hot water can cause painful scalding with possible serious and permanent injury. The temperature at which this occurs varies with a person's age and the length of time in contact with the water. The slower response time of infants, aged or handicapped persons increases the hazard to them.

It is recommended that the temperature control be set for the

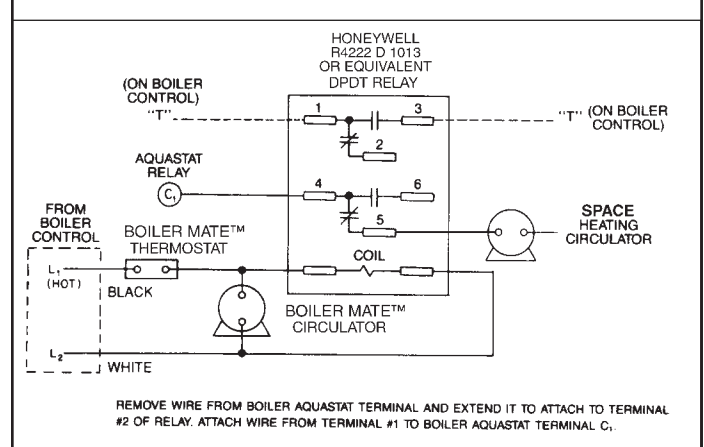
lowest temperature which satisfies your hot water needs. This will also provide the lowest operating costs.

In conjunction with a Consumer Product Safety Commission recommendation, an initial setting of 120° F is recommended. This may or may not be suitable for your needs. Check the temperature at a hot water faucet soon after the burner has completed the first heating. Adjust as needed. Note that adjusting to a lower setting will not have an immediate effect. The stored hot water will first have to be used. Additional checks of the water temperature should follow completion of a cycle. Further adjustments may be necessary as you use your BOILER MATE™ and water piping system.

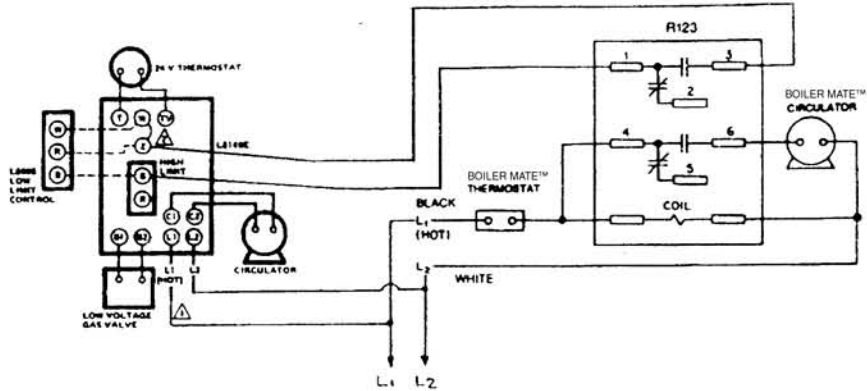
**NOTE: VALVES FOR REDUCING POINT OF USE TEMPERATURE BY MIXING COLD AND HOT WATER ARE AVAILABLE. CONSULT A LICENSED PLUMBER OR THE LOCAL PLUMBING AUTHORITY.**



## PRIORITY W/CIRCULATORS - SCHEMATIC 4

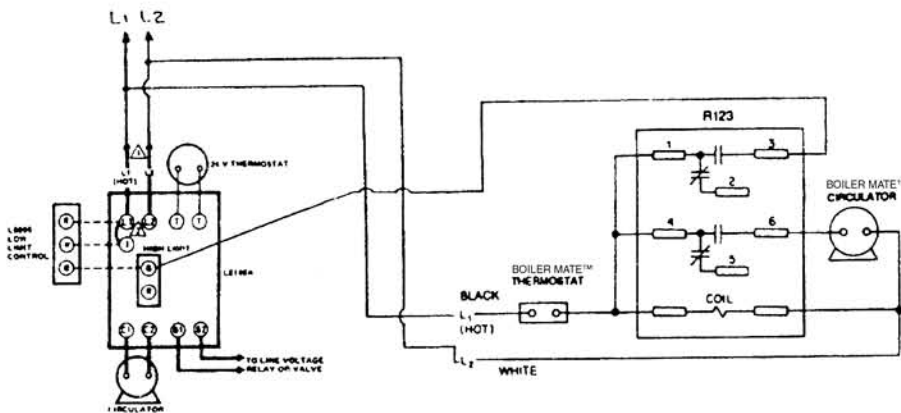


# BOILER CONTROL — SCHEMATIC 5

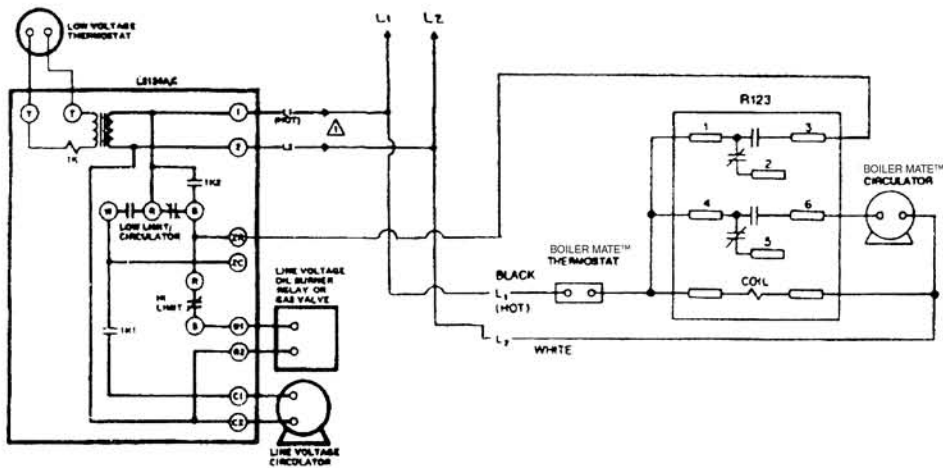


- ⚠ POWER SUPPLY PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED
- ⚠ REMOVE JUMPER WHEN ADDING L6008 LOW LIMIT CONTROLLER TO SYSTEM
- ⚠ AT THE OPTION OF BOILER MANUFACTURER—NOT REQUIRED FOR HOT WATER MAKER OPERATION

## HONEYWELL L8148E



## HONEYWELL L8148A



- ⚠ POWER SUPPLY PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED

## HONEYWELL L8124A & C

# 6. OPERATION/MAINTENANCE.

## FOR FORCED HOT WATER, CLOSED HYDRONIC HEATING SYSTEMS AND LOW PRESSURE STEAM BOILER.

The BOILER MATE™ is intended to provide a tank service life of many years. Components, however, may be subject to failures that require service. Failure to use the correct procedures or parts in these circumstances may make the unit unsafe.

- **DO NOT OPEN DOWN-STREAM FIXTURE IF YOU HAVE LOOSENED THE TOP CONNECTIONS.**
- **DO NOT OVER-DRAIN THE TANK - THE HEAT EXCHANGER MUST REMAIN COVERED BY WATER TO AVOID DAMAGE TO THE LINER.**

The owner should arrange to have the following inspections and simple maintenance procedures done at the frequencies suggested.

**a. Domestic Water Piping** - Yearly Visual Inspection Check all piping for a signs of leakage at joints, unions and shut-off valves. Remedy as needed.

**b. Boiler Water Piping** - yearly Visual Inspection Check all piping for signs of leakage at joints, unions and shut-off valves. remedy as needed.

**c. T & P Relief Valve** - Yearly Inspection

**d. Sediment** - Monthly Inspection - depending on water conditions  
Depending on water conditions, a varying amount of sediment may collect in the tank. This is normal. Levels requiring service are indicated by a small temperature difference in the supply and return lines. (See also "Scale" below.) Repeated flushing usually clears such material. As a preventive measure, each month water should be drawn from the tank at the drain valve until it runs clear.

**e. Scale** - Monthly Inspection

A small temperature difference between the water entering and leaving the coil may indicate a scale build-up. A water softener will prevent this problem. (See also "Sediment" above.) Repeated flushing should also resolve the problem. If not, proceed as follows:

1. To avoid water damage to nearby areas in subsequent steps, shut off the cold water supply to the BOILER MATE™.
2. Make a note of the temperature control setting on the BOILER MATE™, then turn the unit off by depressing the key switch on the Smart Control™ until the unit reads "OFF".
3. Relieve the water pressure in the tank by opening a hot water faucet. This will reduce the risk of scalding injury.
4. Remove the relief valve from the top of the BOILER MATE™, taking care to avoid contact with the hot water which may drain out of the lines leading to the domestic uses.
5. Drain the BOILER MATE™ until the water within the tank is even with the top of the heat exchanger - roughly 15 gallons for 41-gallon units and 5 gallons for 26-gallon units.

**⚠ DANGER** Do not over-drain the tank. Improper thermostatic control could result during Step 6 and lead to damage to the BOILER MATE™.

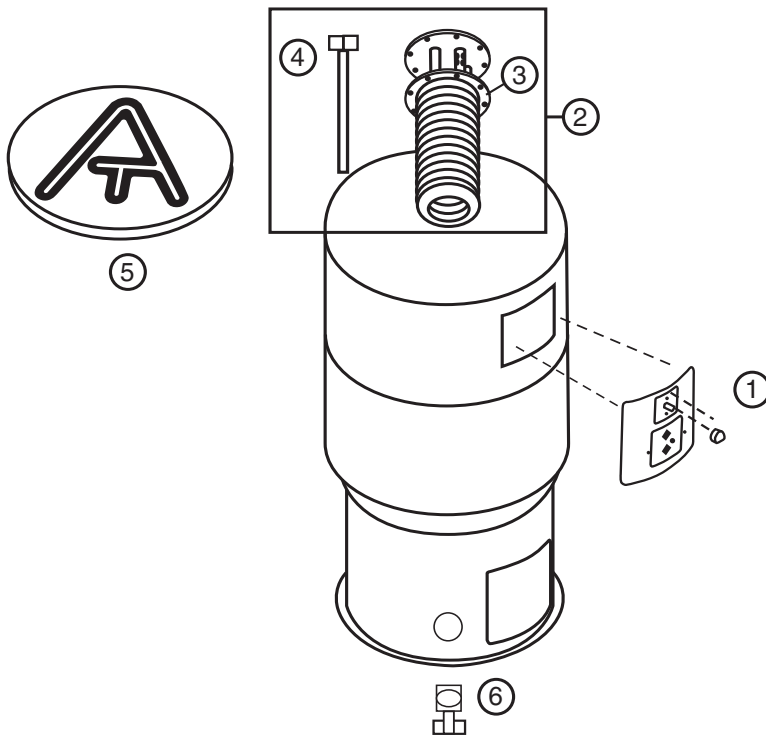
6. Using a funnel, pour one gallon of commercial phosphoric acid solution (commercial icemaker cleaning solution) into the water tank through the top opening. Be sure that the manufacturer's directions, cautions, and warning on the container are followed:
7. Set the temperature control to its highest setting and operate the system until the control is satisfied. **Note:** Boiler may cycle on its high limit several times during this period. If the tank temperature setting has not been satisfied after 45 minutes of boiler operation, turn it to its lowest setting to stop boiler operation.
8. Allow heated solution to set in tank for 30 minutes. then drain tank completely using fitting and hose, as required, to reach a floor drain.
9. Fill water tank with fresh, cold, conditioned water and drain completely at least two time to flush all phosphoric acid mixture from the tank.
10. Reinstall the temperature pressure relief valve, being sure the (1) the temperature pressure relief valve temperature probe reaches into the top portion of the tank and (2) the top half union fitting is firmly in place.
11. Open the cold water supply and fill the tank with water. Then purge air from lines and tank by operating hot and cold water faucets in the house.
12. Return the Smart Control™ to the setting noted in Step 2 and verify it is working properly as described on page 17.

As an alternative to the above, the heat exchanger may be removed from the BOILER MATE™, cleaned, and reinstalled (with a new gasket); or, in some cases, a simple high velocity washing by water from a wand may be used in place of Steps 5-9. The chemical cleaning process, however, is the most effective if done properly.

# 7. REPLACEMENT PARTS

## RESIDENTIAL BOILER MATE™ CLASSIC

(TD-7Z and TD-41Z)



**⚠ DANGER** ELECTROCUTION HAZARD.  
THE BOILER MATE™ MUST  
BE ELECTRICALLY GROUNDED.

### NOTES:

1. THE BOILER MATE™ MUST BE ELECTRICALLY GROUNDED AND INSTALLED IN ACCORDANCE WITH LOCAL CODES, OR IN THE ABSENCE OF LOCAL CODES, WITH THE NATIONAL ELECTRIC CODE.
2. HEAT EXCHANGER PACKAGE INCLUDE ITEMS 5-11
3. TORQUE NUTS 12 TO 14 FT. LBS.

**⚠ WARNING** FAILURE TO USE THE  
CORRECT REPLACEMENT  
PARTS MAY MAKE YOUR UNIT UNSAFE.

ITEM	DESCRIPTION	PART NUMBER
1	AQUASTAT CONTROL	2704-093
2	HEAT EXCHANGER - COMPLETE	2700-5004
3	GASKET ONLY	2704-403
4	THERMISTOR DRY WELL	2700-924
5	TOP COVER	20-0001
6	DRAIN VALVE	9340-087

## 8. TROUBLE SHOOTING CHECKLIST

PROBLEM	CAUSE	SOLUTION
<p><b>1. No hot water at faucet.</b></p>	<p>1.Boiler does not operate.</p> <p>2.Circulator does not operate.</p> <p>3.Improper BOILER MATE™ setting or calibration.</p> <p>4.Zone valve does not open.</p> <p>5.Electrical problems (relay, wiring, fuse, low voltage, brown-outs, etc.)</p> <p>6.BOILER MATE™ scale build-up.</p> <p>7.Clogged filter (if used) or clogged strainer in steam boiler systems.</p>	<p>1.a. Press reset button on boiler. b. Check main cut-off switch. c. Check fuse.</p> <p>2.a. Check power supply. b. Check shaft coupling. c. Check impeller for locking.</p> <p>3. Set BOILER MATE™ temperature to a higher setting. Call boiler service.</p> <p>4. Check power supply.</p> <p>5.a. Check fuse and replace. b. Check circuit breaker and reset (if applicable). c. Check power supply. d. Low voltage or brown-out conditions can make the boiler control inoperative; engage the boiler reset button.</p> <p>6. If boiler, circulator, and BOILER MATE™ temperature controls are operating satisfactorily, the BOILER MATE™ coil may have scale coating. Remove coil and clean or keep coil in tank and treat with a phosphoric acid product (e.g. NuCalgon - 1-800-554-5499) (Refer to page 20)</p> <p>7. Clean and replace filter.</p>
<p><b>2. Insufficient or runs out of hot water at faucet.</b></p>	<p>1. BOILER MATE™ temperature setting too low.</p> <p>2. Undersized boiler with no priority to domestic hot water.</p> <p>3. Peak use of hot water is greater than BOILER MATE™ storage.</p> <p>4. BOILER MATE™ scale build-up.</p> <p>5. Faulty BOILER MATE™ temperature control.</p>	<p>1. Set BOILER MATE™ temperature control to a higher setting.</p> <p>2. Rewire for priority.</p> <p>3. Determine peak usage and compare tank volume.</p> <p>4. Clean coil according to instructions.</p> <p>5. Replace control.</p>
<p><b>3. Water at faucet too hot.</b></p>	<p>1. BOILER MATE™ temperature is set too high.</p> <p>2. Improper system plumbing.</p> <p>3. Improper system wiring.</p> <p>4. Probe out of thermostat well.</p>	<p>1. Lower BOILER MATE™ temperature.</p> <p>2. Compare plumbing to installation guide.</p> <p>3. Compare wiring to installation guide.</p> <p>4. Check to make sure Probe is properly inserted, see Figure 2 Page 8.</p>
<p><b>4. Boiler cycles more than 5 times per day in summer. Boiler runs for longer Periods of time .</b></p>	<p>1. Excessive demand.</p> <p>2. Damaged or broken BOILER MATE™ temperature control.</p> <p>3. Boiler hi-limit set too low.</p> <p>4. BOILER MATE™ scale build-up.</p>	<p>1. Reduce demand or consider larger BOILER MATE™.</p> <p>2. Replace BOILER MATE™ temperature control.</p> <p>3. Increase boiler hi-limit.</p> <p>4. Clean coil according to instructions.</p>



# AMTROL® BOILERMATE™ CLASSIC AND TOP-DOWN™ LIMITED PRODUCT WARRANTY

This Warranty cannot be transferred - it is extended only to the original Purchaser or First User of the Product. By accepting and keeping this Product you agree to all of the warranty terms and limitations of liability described below.

**IMPORTANT WARNING: READ CAREFULLY THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS MANUAL ("MANUAL") to avoid serious personal injury and/or property damage and to ensure safe use and proper care of this product.**

Mail Your Product Registration Card Within 30 Days of Purchase to Ensure Your Warranty Coverage or Proof of Purchase Will Be Required for All Warranty Claims.

## **LIMITED LIFETIME WARRANTY\* Tank Assembly and Heat Exchanger (To Original Product Owner, Single Family Residence)**

WH and TD Model Numbers Covered: WH-7Z, WH7-ZDW, WH7-P, WH7-L, WH7-LDW, WH-9L, WH-9LDW, TD-7L, TD-7Z, TD-7P, TD-7LDW, TD-7ZDW

## **LIMITED FIVE YEAR COMMERCIAL WARRANTY\*\***

Model Numbers Covered: WH7C, WH7CDW

## **LIMITED FIVE YEAR TRANSFERRABLE WARRANTY\*\***

Model Numbers Covered: WH-41Z, WH-41L, TD-41L, TD-41Z, TD-41LDW and TD-41ZDW only

Warranty for these models only runs from date of manufacture and are transferable

\*FOR AS LONG AS YOU OWN AND LIVE IN YOUR SINGLE FAMILY HOME, this Warranty covers the tank assembly and heat exchanger, if you are the first user or original owner of this BoilerMate™ Classic and Top-Down™ and purchased it for single family home use – subject to all of the conditions, limitations and exclusions listed below. Purchasers who buy the BoilerMate™ Classic and Top-Down™ for other purposes, and other component parts are subject to more limited warranties and you should read all of the terms included in this form to make sure you understand your Warranty.

## **LIMITED WARRANTY ON BOILERMATE™ CLASSIC AND TOP-DOWN™ TANK ASSEMBLY AND HEAT EXCHANGER**

AMTROL Inc. ("AMTROL") warrants that at the time of manufacture, the BoilerMate™ Classic and Top-Down™ heat exchanger and tank assembly shall be free from defects in material and workmanship for one of two time periods as follows:

**Period 1 – Single Home Use.** If you are the first user or original owner of the BoilerMate™, for as long as you own and occupy the single-family home in which the BoilerMate™ Classic and Top-Down™ has been properly installed.

**Period 2 - \*\* Commercial and Other Uses.** For five years from the date of purchase if you are the first user or original owner first using the new BoilerMate™ Classic and Top-Down™ (except for the model numbers listed above that are transferable), and you are not a homeowner-purchaser as described in Period 1 (for example, if you purchased the Product for re-sale, or a commercial, industrial, non-residential, multi-unit or rental property application).

## **LIMITED ONE YEAR WARRANTY ON ALL BOILERMATE™ CLASSIC AND TOP-DOWN™ COMPONENT PARTS**

AMTROL warrants to the first user or original owner using the new BoilerMate™, that at the time of manufacture, except for the tank assembly and the heat exchanger referenced above, all other AMTROL supplied components or parts of the BoilerMate™ are warranted to be free from defects in material or workmanship for one year from the date of purchase.

## **What AMTROL Will Do If You Have a Covered Warranty Claim**

In the event of a breach of the foregoing warranty, AMTROL will at its option either make repairs to correct any defect in material or workmanship or supply and ship either new or used replacement parts or products. AMTROL will not accept any claims for labor, property damage or other costs.

## **What This Warranty Does Not Cover - Exclusions and Limitations**

This Warranty does not cover any claim unless it was caused by a defect in material or workmanship during the warranty periods specified above. In addition, this Warranty shall not apply:

- if the Product is not correctly installed, operated, repaired or maintained as described in the Manual provided with the Product;
- to any failure or malfunction resulting from abuse (including freezing); improper or negligent: handling, shipping (by anyone other than AMTROL), storage, use, operation, accident; or alteration, lightning, flood or any other environmental condition;
- to any failure or problem resulting from the use of the Product for any purpose other than those specified in the accompanying Manual or alteration of any part of the product;
- if the Product is used anywhere except the United States, its territories or possessions, or Canada;
- this Warranty does not cover labor costs, shipping charges, service charges, delivery expenses, administrative fees or any costs incurred in removing or reinstalling the Product;
- this Warranty does not cover any claims submitted to AMTROL or an AMTROL-authorized distributor or retailer more than 30 days after expiration of the applicable warranty time period described in this Warranty;
- this Warranty also does not cover repair or replacement costs not authorized in advance by AMTROL.
- if the unit has not always been operated within the factory calibrated temperature limits, and at a water pressure not exceeding 150 psi or it is subjected to chlorine concentrations in excess of 5 ppm;

## **Additional Warranty Limitations**

**ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY DISCLAIMED.** Some states do not allow limitations on how long an implied Warranty lasts, so the above limitation may not apply to you.

## **Limitations of Remedies**

**THE REMEDIES CONTAINED IN THIS WARRANTY ARE THE PURCHASER'S OR FIRST USER'S EXCLUSIVE REMEDIES. IN NO CIRCUMSTANCES WILL AMTROL BE LIABLE FOR MORE THAN, AND PURCHASER-FIRST USER'S REMEDIES SHALL NOT EXCEED, THE PRICE PAID FOR THE PRODUCT. IN NO CASE SHALL AMTROL BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM NONDELIVERY OR FROM THE USE, MISUSE, OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT OR FROM AMTROL'S OWN NEGLIGENCE OR OTHER TORT.** This exclusion applies regardless of whether such damages are sought for breach of warranty, breach of contract, negligence, strict liability, in tort or under any other legal theory. Such damages include, but are not limited to, inconvenience, loss or damage to property, mold, loss of profits, loss of savings or revenue, loss of use of the Products or any associated equipment, facilities, buildings or services, downtime, and the claims of third parties including customers. Some states do not allow the exclusion or the limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

## **What To Do If You Have a Problem Covered By This Warranty**

Any covered Warranty service must be authorized by AMTROL. Contact the person from whom you purchased the Product, who **must** receive authorization from an AMTROL distributor or AMTROL. If you do not receive a prompt response, call AMTROL directly at 401-535-1216. Notice of a Warranty claim should be submitted by the authorized distributor to AMTROL at the following address:

AMTROL Inc., Warranty Claim Dept.  
1400 Division Rd., West Warwick, RI 02893

Before AMTROL determines to provide any replacement part or Product, it may as a pre-condition to making such a determination require that the warranty claimant ship the Product, postage prepaid to an authorized AMTROL distributor, or to AMTROL and provide proof of purchase evidenced by the original sales receipt or Product registration.

## **Replacement Product Warranty**

In case of replacement of a Product or any component part, AMTROL reserves the right to make changes in the design, construction, or material of the substitute components or products, which shall be subject to all of the terms and limitations of this Warranty, except that the applicable warranty periods shall be reduced by the amount of time the warranty claimant owned the product prior to submitting notification of the warranty claim.





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