

H₂O

- ❑ INDIRECT-FIRED WATER HEATERS WITH DUAL COIL
- ❑ SOLAR HOT WATER STORAGE TANK APPLICATIONS
- ❑ DUAL COIL INDIRECT FIRED WATER HEATERS WITH OR WITHOUT ELECTRIC BACKUP
- ❑ INDIRECT FIRED WATER HEATERS SINGLE COIL WITH ELECTRIC BACKUP

MODELS

H₂OI60D
H₂O60E
H₂O60DE

H₂OI80D
H₂OI80E
H₂OI80DE

H₂OI115D
H₂OI115E
H₂OI115DE

60, 80, 115 Gallon

D = Dual Coil

E = Electric Backup Element

INSTALLATION, OPERATION & MAINTENANCE MANUAL



Intertek

Conforms to UL STD 174

Certified to CAN/CSA STD C22.2 No. 110-94



61500056

I. General Information

IMPORTANT INFORMATION – READ CAREFULLY

NOTE: The equipment shall be installed in accordance with those installation regulations required in the area where the installation is to be made. These regulations shall be carefully followed in all cases. Authorities having jurisdiction shall be consulted before installations are made.

All wiring on water heaters shall be in accordance with the National Electrical Code and/or local regulations.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury, or loss of life. Read and understand the entire manual before attempting installation, start-up, operation, or service. Installation and service must be performed only by an experienced, skilled installer or service agency.

This water heater contains very hot water under high pressure. Do not unscrew any pipe fittings or attempt to disconnect any components of this water heater without positively assuring that the water is cool and has no pressure. Always wear protective clothing and equipment when installing, starting up or servicing this water heater to prevent scalding injuries. Do not rely on the pressure and temperature gauges to determine the temperature and pressure of the water heater. This water heater contains components that become very hot when the boiler is operating. Do not touch any components unless they are cool.

Failure to follow all instructions in the proper order can cause personal injury or death. Read all instructions, including all those contained in component manufacturers' manuals before installing, starting up, operating, maintaining, or servicing the water heater.

CAUTION

To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes but no less than a combination temperature relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22- latest edition. This valve must be marked with a maximum set pressure not to exceed the marked working pressure of the water heater. Install the valve into an opening provide and marked for this purpose in the water heater, and orient it or provide tubing so that any discharge from the valve will exit only within 6 inches above, or at any distance below, the structural floor, and cannot contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.

The heat transfer medium must be water or other non-toxic fluid having a toxicity rating or class of 1, as listed in clinical Toxicology of Commercial Products, latest edition.

The pressure of the heat transfer medium must be limited to a maximum of 30 psig by an approved safety or relief valve.

DANGER

DO NOT store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

If you smell gas vapors, DO NOT try to operate any appliance - DO NOT touch any electrical switch or use any phone in the building. Immediately, call the gas supplier from a remote located phone. Follow the gas supplier's instructions or if the supplier is unavailable, contact the fire department.

II. IMPORTANT SAFETY INSTRUCTIONS

WARNING – When using electrical appliances, basic safety precautions to reduce the risk of fire, electric shock, or injury to persons should be followed, including:

READ ALL INSTRUCTIONS BEFORE USING THIS BUFFER TANK.

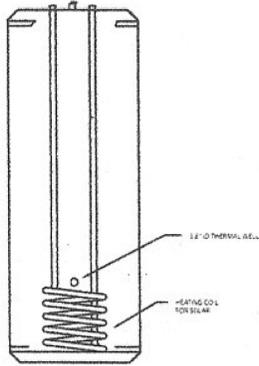
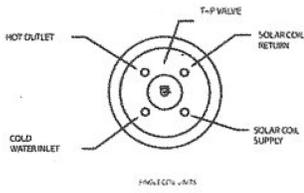
- 1.** This water heater must be grounded. Connect only to properly grounded outlet. See "GROUNDING INSTRUCTIONS" found in Section IV.
- 2.** Install or locate this water heater only in accordance with the provided installation instructions
- 3.** Use this water heater only for its intended use as described in this manual.
- 4.** Do not use an extension cord set with this water heater. If no receptacle is available adjacent to the water heater, contact a qualified electrician to have one properly installed.
- 5.** As with any appliance, close supervision is necessary when used by children.
- 6.** Do not operate this water heater if it has a damaged cord or plug, if it is not working properly, or if it has been damaged or dropped.
- 7.** This water heater should be serviced only by qualified personnel. Contact nearest authorized service facility for examination, repair, or adjustment.

SAVE THESE INSTRUCTIONS

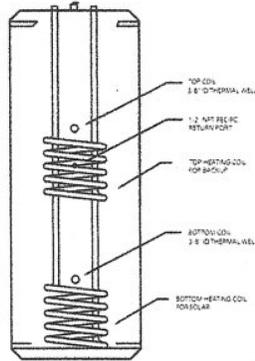
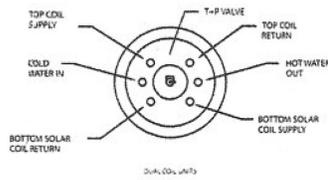
Table 1 - Dimensions and Capacities

Model	Storage Volume	Top Coil Heating Surface	Bottom Coil Heating Surface	Dimensions (Inches)		Pipe Connections	Max. Working Pressure	Approx. shipping Wt.
	Gals.	Sq. Ft.	Sq. Ft.	Ht.	Dia.	NPT	(psi)	Lbs.
Single Coil - No Electric Backup								
H2OI115	115	-	8.9	74.0	28.0	1" NPT	150	175
H2OI80	80	--	8.0	56.0	28.0	1" NPT	150	140
H2OI60	60		8.3	62.0	23.5	1" NPT	150	125
Single Coil - with 3500 watt Electric Backup								
H2O115E	115	-	8.9	74.0	28.0	1" NPT	150	180
H2O080E	80	-	8.0	56.0	28.0	1" NPT	150	145
H2O60E	60	-	8.3	62.3	23.5	1" NPT	150	135
Dual Coil - No Electric Backup								
H2O115D	115	7.4	8.9	74.0	28.0	1" NPT	150	205
H2O80D	80	7.4	8.0	56.0	28.0	1" NPT	150	175
H2O60D	60	7.4	8.3	62.0	23.5	1" NPT	150	165
Dual Coil - with 3500 watt Electric Backup								
H2O115DE	115	7.4	8.9	74.0	28.0	1" NPT	150	215
H2O80DE	80	7.4	8.0	56.0	28.0	1" NPT	150	185
H2O60DE	60	7.4	8.9	62.0	23.5	1" NPT	150	175
Storage Only - No Coil, No Electric Backup								
H2O115ST	115	-	no coil storage only	74.0	28.0	1" NPT	150	170
H2O80ST	80	-		56.0	28.0	1" NPT	150	130
H2O60ST	60	-		62.0	23.5	1" NPT	150	115

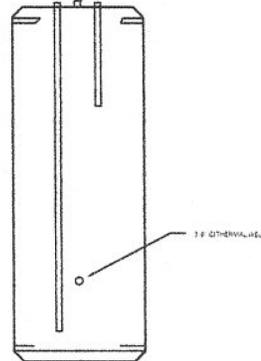
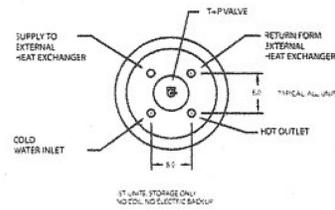
SINGLE COIL UNITS



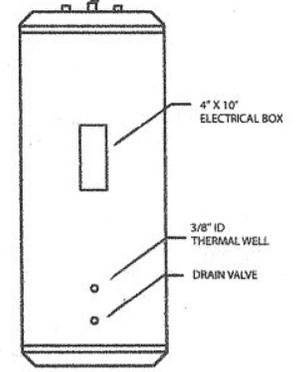
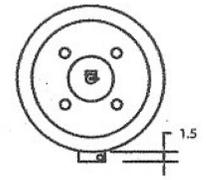
DUAL COIL UNITS



STORAGE UNITS



ELECTRIC BACKUP UNITS



Heat exchanger coil outputs				
Model	Max. Recovery (gal./hr.) Top Coil	Max. Recovery (gal./hr.) Bottom Coil	Water Flow Through Coil (gal./min.)	Pressure Drop Through Coil (Ft. Water)
115 Gal. Units	190	214	10.0	3.9
80 Gal. Units	180	214	10.0	3.6
60 Gal. Units	185	214	10.0	3.5

Note: All Ratings are based on 180 degree F boiler water supply and 50 degree F cold Water inlet. In the interest of continuous improvement, specifications are subject to change without notice.

For all units with 3500 watt Electric Backup				
Model	First Hour Rating (gal./hr.)		Continuous Rating (gal./hr.)	
	140 F	115 F	140 F	115 F
115 Gal. Units	73.9	80.0	15.9	22.0
80 Gal. Units	55.9	62.0	15.9	22.0
60 Gal. Units	45.9	52.0	15.9	22.0



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II. Pre-installation Considerations

Inspect shipment carefully for signs of damage. All equipment is carefully inspected and packed. 's responsibility ceases upon delivery of the water heater to the carrier in good condition. Any claims for damage or shortage, must be filed immediately against the carrier by the consignee. No claims for variances or shortages will be allowed by the Manufacturer, unless they are presented within sixty days after receipt of the equipment.

Installation must conform to the requirements of the authority having jurisdiction. In the absence of such requirements, installation must conform to the National Plumbing Code and the National Electrical Code ANSI/NFPA No. 70, current edition.

IMPORTANT CONSIDERATIONS BEFORE INSTALLATION

1. Water Heater Sizing.

Choose the water heater model based on the expected water usage for the given site. The average residence with one shower or more will require a Model 40 or larger. The Model 30 should only be considered for residences with minimal water demand, or for commercial applications without showers.

Factors that increase water demand dramatically include high flow shower heads, hot tubs, and the use of more than one shower at a time. Increase the tank size if these factors are present. Consult ASHRAE sizing guides and other references.

Dimensions, weights, ratings, and capacities are outlined in Tables 1 and 2.

2. Boiler Sizing.

The water heater will provide the rated performance only if it is used with a boiler with a heating capacity of at least as much as the capacity ratings in Table 2. If the boiler has less capacity, the water heating output will be reduced. To determine performance with other boiler outputs, refer to the expanded capacity tables in the Appendix.

3. Circulator Sizing.

Refer to Table 2 for the minimum flow through the water heater coil and the pressure drop at minimum flow. Calculate the pressure drop across all piping and fittings connected to the water heater zone. Be sure to include all zone valves, check valves, and shut-off valves. It is recommended that the water heater zone be piped with 1" pipe around the entire loop on typical residential sites.

A. System Zone Control

The water heater must be installed as a separate zone from the space heating system. The water heating zone's piping and circulator must be sized for the minimum flow rate with all the zones in use and a maximum flow with only the water heater in use. This is the reason that the best method of zone control is with circulators.

The three most common systems are:

1. **Zone Circulators-** The space heating zones use a circulator for each zone, and the water heater is controlled with an additional circulator.
2. **Hybrid System-** The space heating zones use zone valves for each zone, and the water heater is controlled with an additional circulator.
3. **Zone Valves –** The space heating zones use zone valves for each zone, and the water heater is controlled with an additional zone valve. Select a valve with a low pressure drop, and assure minimum flow with adequate pipe sizing.

B. Priority or Non-Priority for Hot Water

1. **Option 1 – Priority.** The demand for space heating is interrupted until the hot water demand is satisfied. This option provides the maximum delivery of hot water.
Priority is recommended when:
 - A. The boiler output is less than 100,000 Btu per hour, or
 - B. The boiler output required to satisfy the hot water demand is more than 50% of the boiler output needed to satisfy the space heating demand, or
 - C. When an interruption in space heating can be tolerated during long domestic hot water draws.
In most cases the delay in space heating will not be noticed because of the rapid recovery of the water heater. It must be recognized however that certain water heater malfunctions, such as a failed thermostat or circulator, could delay space heating indefinitely.
2. **Option 2 – Non-Priority.** The boiler output is divided between space heating and water heating. Heating of domestic hot water can be reduced during simultaneous space and water heating demands. The amount of reduction depends on the boiler output, the number of space heating zones calling, and the amount of boiler water flow split between the space heating and zones and the water heater zone.

C. Locating the water heater.

The water heater should be located in an area where water leakage from the tank or connections will not result in damage to areas adjacent to the water heater or to lower floors of the structure. When such a location can not be avoided, a suitable drain pan must be installed under the water heater, and the drain pan must be connected to a drain.

The water heater should be installed as close to the boiler as is practical for easy access for service. The unit is designed for installation on combustible flooring and in alcoves, closets, etc.

The minimum clearances from combustible surfaces are:

Bottom-----0"
Left, right, and rear sides -- 1"
Front-----1"
Top-----6"

The minimum clearances for service are:

Bottom-----0"
Left, right, and rear sides -- 3"
Front-----30"
Top-----6"

D. Additional recommended components

1. Shut-off valves. Allows the isolation of the water heater from the boiler system during service.
2. Unions. Allows for easy locating or removal.
3. Vacuum breaker. Protects the water heater from collapse if a hot tank is valved off to service other components in the system.
4. Thermal expansion tank. If the water heater is installed in a closed water supply system, such as a system having a back flow preventer in the cold water supply line, the installation of a thermal expansion tank is required.

E. Removing the Existing Domestic Water Heating System

1. External Tankless Heater- Disconnect all lines to the boiler and plug the boiler fittings. Disconnect the external heater from the boiler piping, and the domestic piping systems.
2. Internal Tankless Heaters- Disconnect the domestic piping. Do not plug the cold water or the hot water fittings in the internal tankless coil. Leave the coil in the boiler with the cold and hot water fittings open to prevent pressure build-up in the coil.

F. Water Quality

Improper water quality will reduce the expected life of the water heater. Hard water, sediment, high or low Ph, and high levels of chlorides in the domestic water should be avoided. Sediment and hard water will eventually coat the heating coil inside the water heater and reduce the rate of hot water production and may, eventually cause a failure. High or low Ph and/or high chloride concentrations will cause corrosion and eventually failure. A filter is strongly recommended where sediment is present in the water. A water softening system is recommended for areas with hard water.

In an area where the water quality is not known, a water quality test should be performed.

WARNING:

Do not operate the water heaters in areas where the Ph is above 8.0 or below 6.0, and/or with chloride concentrations greater than 80 parts per million (ppm). ECR's standard warranty does not cover problems caused by improper water Ph or excessive levels of chlorides.

III. Piping

A. Domestic Water Piping. See Figure 1.

1. Drain the domestic water system.
Shut off the cold water supply at the main shutoff valve.
Open one or more faucets to relieve the pressure. Open the system drain, leaving the faucets open.
2. Position the water heater in the final location.
3. Connect the cold water supply piping.
Install piping onto cold inlet connection.

Connect to cold water supply connection using a union, a heat trap, a shut-off valve, an expansion tank (where required), a back flow preventer (where required), and a filter (recommended to prevent sediment buildup).

4. Connect the domestic hot water piping.
Install piping on to hot water supply connection using a union, a heat trap, a vacuum breaker, and a shut-off valve.

Pipe the relief valve discharge so that the discharge from the valve will exit only within 6 inches above, or at any distance below, the structural floor, and cannot contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.

5. Fill the water heater tank.
Open all faucets to allow air to purge from the tank and piping. Remove screens on faucets.
Open domestic hot water shut-off valve.
Open cold water inlet shut-off valve.
Purge all of the air from the domestic water system. Allow water to run so the tank is completely purged of any debris. Run the water long enough to change at least five tank volume changes. Close all faucets. Reinstall all of the screens in the faucets.
Check the system for leaks. Repair as required.

B. Water boiler piping. See Figures 2 and 3.

1. Determine where the boiler, the space heating, and the water heater connections should be made based on the type of piping system that is either in place, or is to be installed for a new hydronic system installation. See Figure 2, Boiler Water Piping with Zone Circulators, and Figure 3, Boiler Water Piping with Zone Valves.
2. It is recommended that 1" pipe and 1" zone valves be used on the water heater zone.

Zone Circulator System

For space heating systems that use Zone Circulators, refer to Figure 2. The water heater connection labeled "BOILER SUPPLY" should be piped to the boiler supply piping after the air purger and before the space heating takeoffs. Mount the water heater circulator as close as possible to the water heater, and make sure the flow arrow points toward the water heater. The use of shut-off valves is recommended for future service convenience.

The water heater connection labeled "BOILER RETURN" should be piped to the boiler return piping as close to the boiler as possible and after any flow control or check valves in the space heating return piping. The use of a union and a shut-off valve is recommended. The use of a check valve is required to prevent back flow through the water heater during operation of the space heating system.

Zone Valve System

For a space heating system that uses Zone Valves, refer to Figure 3. The water heater connection labeled "BOILER SUPPLY" should be piped to the boiler supply piping after the air purger and before the space heating circulator. Mount the water heater circulator as close as possible to the water heater, and make sure the flow arrow points toward the water heater. The use of a shut-off valve is recommended for future service convenience.

The water heater connection labeled "BOILER RETURN" should be piped to the boiler return piping as close to the boiler as possible and after any flow control or check valves in the space heating return piping. The use of a union and a shut-off valve is recommended. The use of a check valve is required to prevent back flow through the water heater during operation of the space heating system.

INDIRECT PIPING

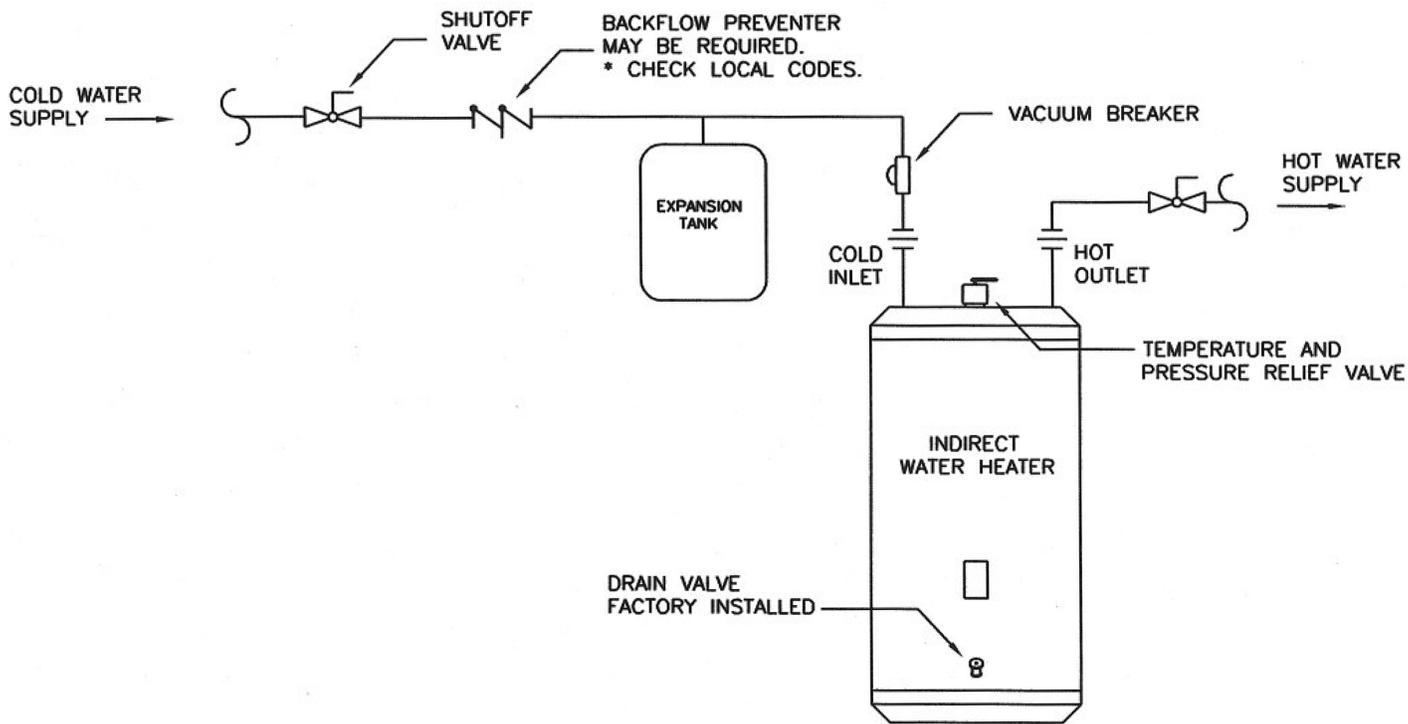


FIGURE 1
DOMESTIC WATER PIPING

NOTE: SEE LOCAL CODE REQUIREMENTS.
BACKFLOW PREVENTER CONFORMING TO CMR 248,
MASS. STATE CODE REQUIRED IN MASSACHUSETTS.

Solar Piping

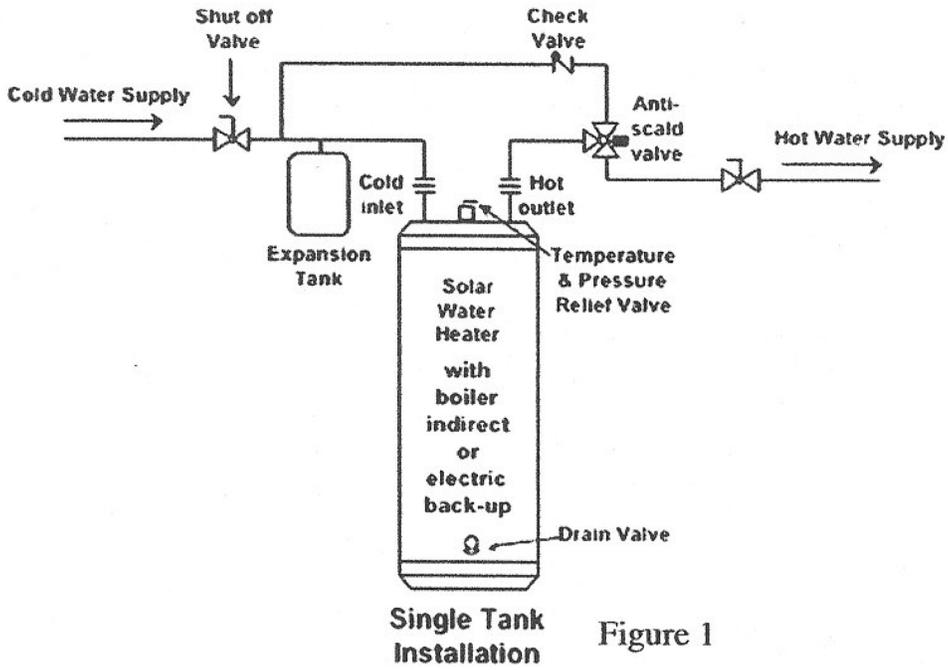


Figure 1

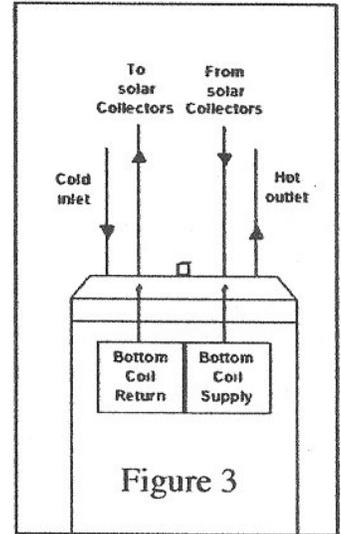


Figure 3

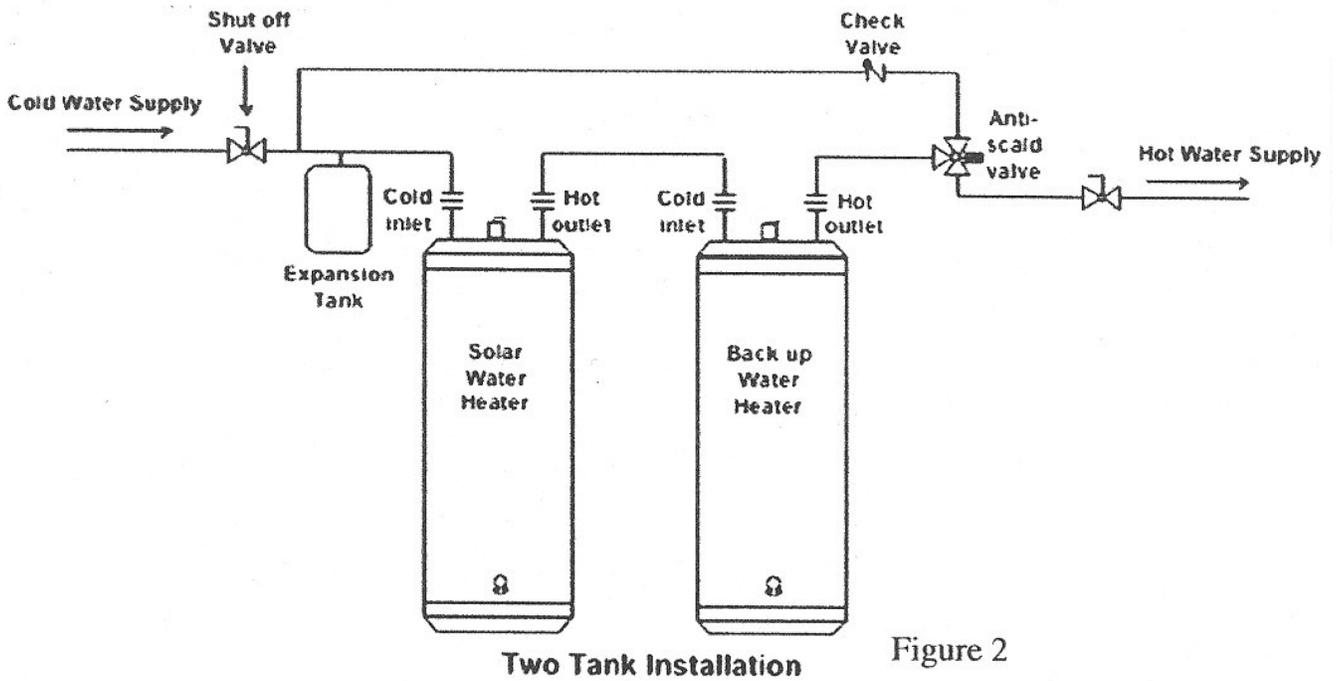
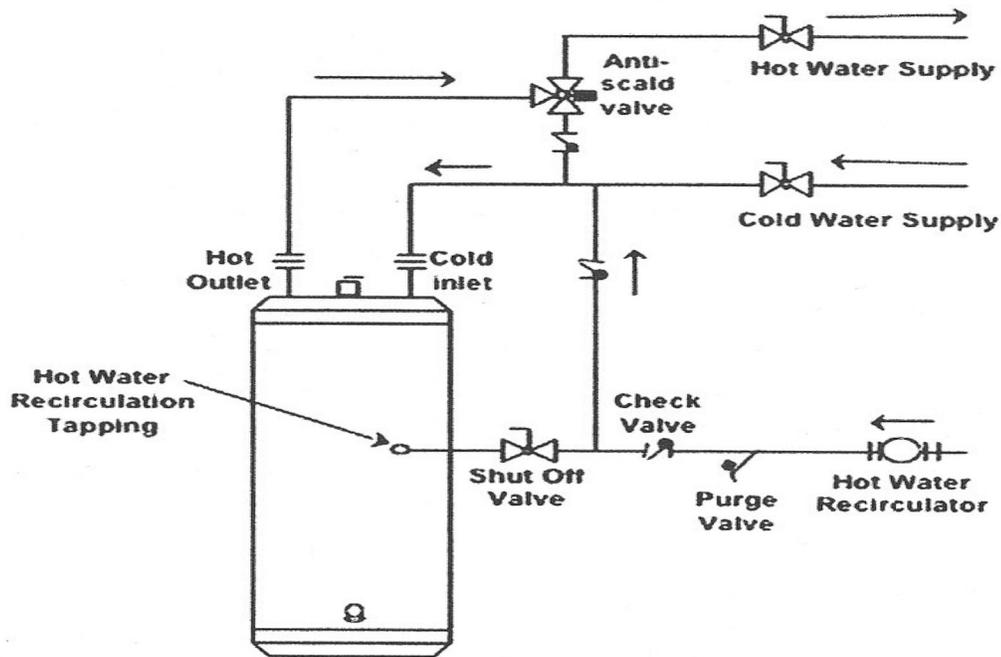


Figure 2

SOLAR PIPING



**Single Tank
Installation with
Hot Water
Recirculation**

Figure 7

Hot Water Recirculation

Hot Water Recirculation for Solar Hot Water Storage Tanks

Hot water recirculation is for the continuous circulation of hot water for instant hot water at the hot water faucets. Solar tank tappings provide hot water recirculation return at the distance mid-height at the side of the tank. See Figure 7. Location of tapping will not allow for mixing of back-up heated hot water (boiler indirect or electric element) into lower solar heated section of the tank.

When an anti-scald device is installed it is critical to feed cold supply of mixing valve with return of recirculated hot water. This is important to keep hot water recirculation loop operating through the mixing valve even if tank temperatures are above mixing valve setting. Otherwise the mixing valve will not allow flow of hot water through it and disable recirculation loop of hot water.

IV. Electrical

1. Install electric wiring and grounding in accordance with the National Electrical code and local regulations.
2. All water heaters are supplied with a thermostat.
3. Refer to schematics 1, 2 and 3 for separate circulator wiring.
Refer to schematics 4, 5 and 6 for zone valve wiring.
Reference should be made to the Installation Manual for the boiler as well.

V. Operation

Startup

After the water heater has been plumbed and wired, and the boiler water piping is purged of air, the water heater is ready to be started.

1. Follow the boiler installation instructions to place the boiler in operation.
2. The tank thermostat is factory pre-set to 125 degrees F and will call for heat if the water in the tank is lower than 125.
3. On a call for heat, the tank thermostat contacts close to start the water heater zone circulator and the boiler.
4. After the tank has reached the temperature setting, the tank thermostat opens and de-energizes the circulator and the boiler. If there is a call for space heating, the boiler will continue to run until the room thermostats are satisfied.

Temperature Adjustment

The tank thermostat controls the maximum water temperature in the water heater. If it is 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 hot water. The slower response time of infants, older, or handicapped people increases the hazard for them.

It is recommended that the thermostat be set for the lowest possible temperature that satisfies your needs. This will also provide you with the lowest energy consumption and cost.

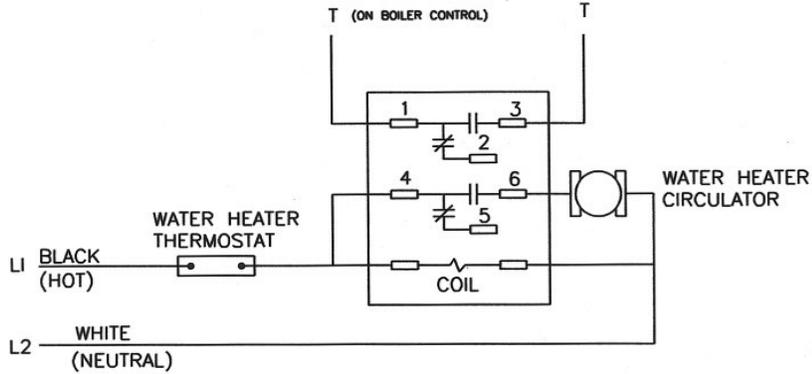
Check the water temperature at a hot water faucet soon after the tank thermostat has satisfied, and the circulator and the boiler have turned off. Adjust as needed.

Lowering the thermostat setting will not have an immediate effect on the water temperature because the stored water will have to be used and the thermostat must go through the cycle of heating cold water and satisfying at the new, lower temperature. Additional temperature checks should follow the completion of a heating cycle. Further adjustments may be required after you have used the water heater.

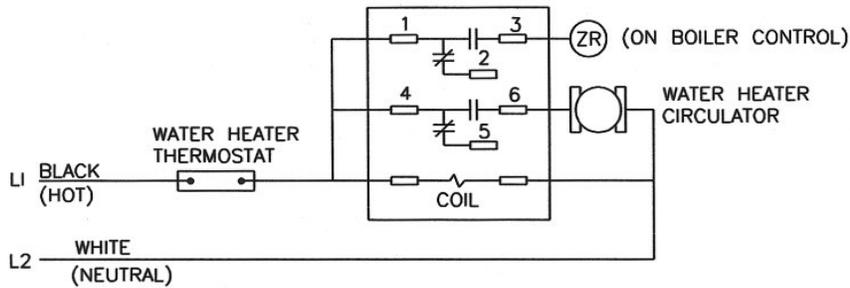
Indirect Wiring

SEPARATE CIRCULATOR WIRING

Honeywell Relay R4222D1013 with Q633A receptacle

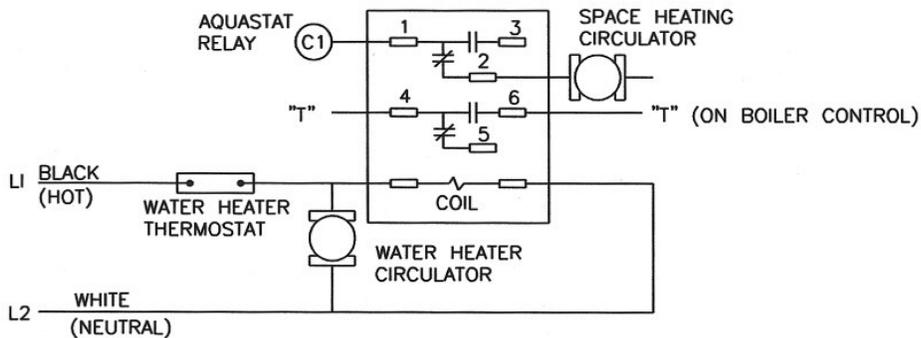


SCHEMATIC 1
24 VOLT "T-T" WIRING



WHEN NO "ZR" TERMINAL IS AVAILABLE
WIRE TO THE SUPPLY SIDE OF THE HI LIMIT

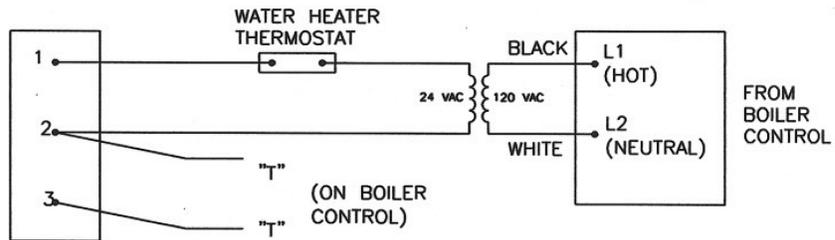
SCHEMATIC 2
120 VOLT - ZR TERMINAL



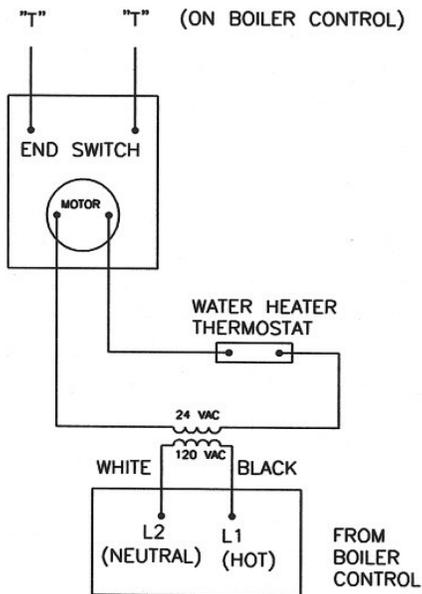
SCHEMATIC 3
PRIORITY WITH CIRCULATORS

Indirect Wiring

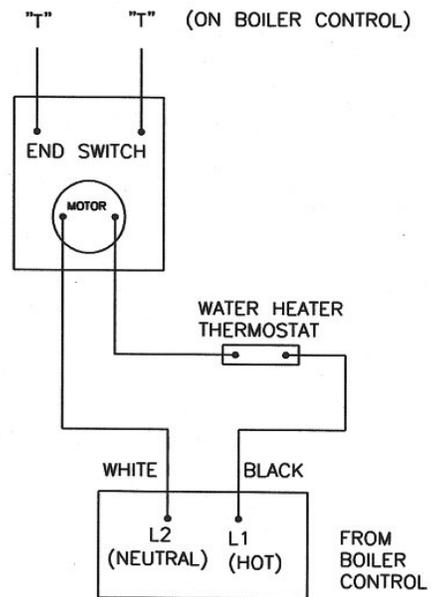
ZONE VALVE WIRING



SCHEMATIC 4
3-WIRE ZONE VALVE

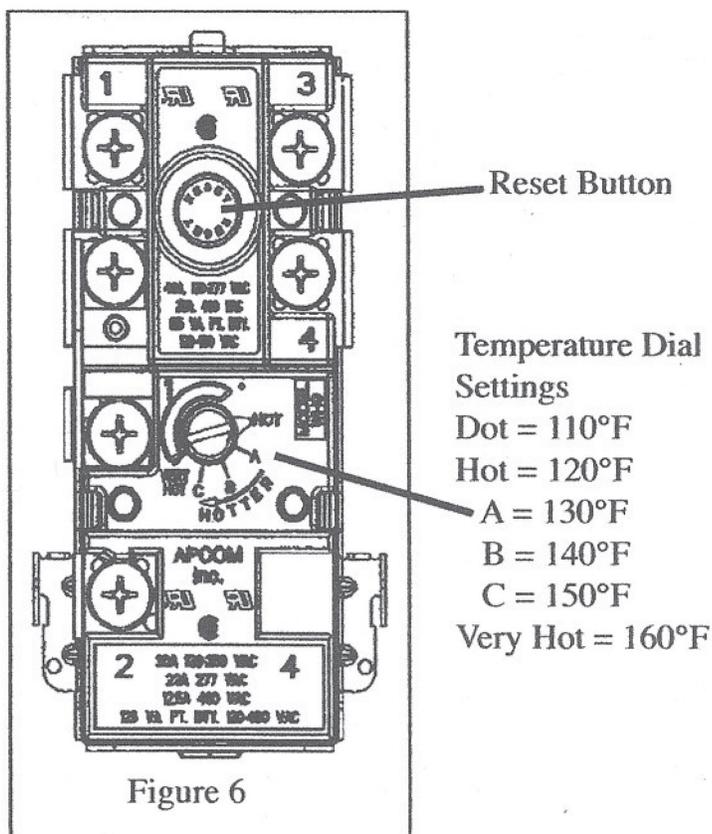
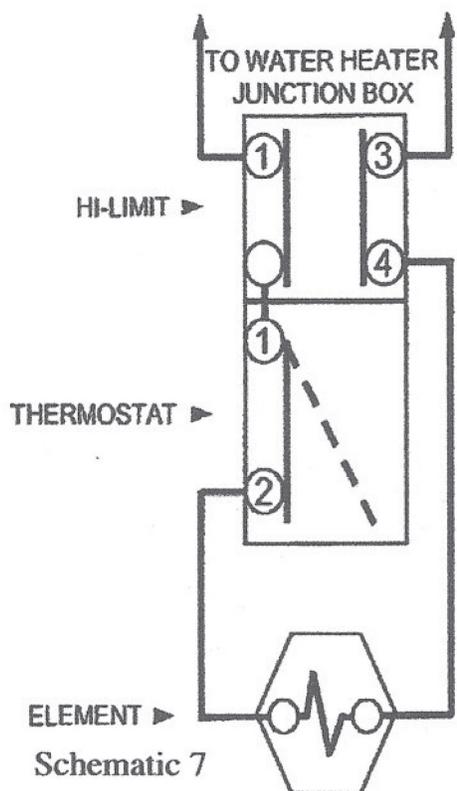


SCHEMATIC 5
4-WIRE ZONE VALVE WITH 24 VOLT MOTOR



SCHEMATIC 6
4-WIRE ZONE VALVE WITH 120 VOLT MOTOR

-E Units, Electric Backup Wiring



Reset Button

Temperature Dial Settings

- Dot = 110°F
- Hot = 120°F
- A = 130°F
- B = 140°F
- C = 150°F
- Very Hot = 160°F

Solar Electric Tank

Electric Connections

Solar electric hot water heater includes 240 VAC thermostat and 4500 watt element.

See Schematic 7.

Connect Electric Heating Element

Before any electrical connections are made, verify water heater is full of water and valve in cold water supply line is open. Solar water heater is supplied with single electric heating element backup system. Thermostat incorporates manual reset temperature-limiting device. Refer to "Troubleshooting Guide" section for manual reset operation. Turn off all power related to heating system before proceeding with electrical connections. Any and all wiring shall be sized and installed to satisfy voltage and amperage used. Water heater must be well grounded. Green ground screw is provided at electrical connection point for connecting ground wire. All wiring shall be done in accordance with all applicable local and state codes.

Adjusting Thermostat Temperature Dial

Minimum potable water temperature can be changed by adjusting thermostat. Before any work is done on water heater, disconnect all power to the water heater and heat source (solar collector) by opening the switch(s) at main electrical circuit breaker or fuse box. Remove cover and fold insulation outward away from control. Adjust thermostat dial using screwdriver until minimum acceptable temperature is achieved. Rotate thermostat dial clockwise to increase water temperature. Rotate thermostat dial counter-clockwise to decrease temperature setting. See Figure 6 for temperature settings.

Thermostat has been factory preset to 120°F (49°C). Remember lower temperature settings are more energy efficient. Replace insulation make sure control is well covered and plastic terminal shield has not displaced. Replace access panel. Water heater is now ready for operation.

VI. Maintenance

The water heater is intended to provide many years of reliable service. Components, such as thermostats and relief valves, may be subject to failures that require service. Depending on the quality of the water supply, sediment and/or scale may coat the heating coil in the tank and reduce hot water recovery rate. Failure to use the correct procedures or parts can result in unsafe operation.

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

1. **Boiler and Domestic Water Piping (Annual)**
Check all piping for signs of leakage at the joints, unions and shut-off valves. Repair as required.
2. **Temperature and Pressure Relief Valve (Annual)**
3. **Sediment (Annual except where harsh water quality may require more frequent service)**
Depending on water conditions, a varying amount of sediment may collect in the tank. Levels requiring service are indicated by a small temperature difference between the boiler supply and return lines, and a reduced recovery rate. Repeated flushing usually clears such material. As a preventive measure, water should be drawn from the drain valve until it runs clear and the installation of a water filter should be considered.
4. **Scale (Annual)**
Hard water may cause scale buildup on the outside of the heating coil inside the tank. A water softener will prevent this problem. Symptoms are identical to sediment buildup. If repeated flushing does not resolve the problem, chemical cleaning may be required. Proceed as follows:

Chemical Cleaning Of The Heating Coil

1. To avoid water damage, shut off the cold water supply to the water heater.
2. Make a note of the temperature control setting on the water heater, and turn off the power to the water heater.
3. Relieve the water pressure in the tank by opening a hot water faucet. This will reduce the risk of scalding.
4. Remove the relief valve from the water heater.
5. Drain the water heater until the water is at a level equal to 3" above the thermostat well. This level will cover the coil and the thermostat.
6. Using a funnel, pour one gallon of commercial ice maker cleaning solution into the tank through the relief valve opening. Follow the instructions, cautions, and warnings supplied with the cleaning solution.
7. Set the water heater thermostat to its highest setting, turn on the power to the water heater, and allow the boiler to heat the water until the tank thermostat is satisfied. The boiler may cycle on its high limit several times during this period. If the tank thermostat is not satisfied after 45 minutes of boiler operation, turn the thermostat to its lowest setting.
8. Allow the heated solution to set in the tank 30 minutes.
9. Drain the tank completely using fittings and hoses, as required, to reach a drain.
10. Fill the water heater tank with fresh, cold, water and drain it completely. Repeat filling and draining at least three (3) times to flush all of the cleaning solution from the tank.
11. Reinstall the relief valve and the drain piping.
12. Open the cold water supply and fill the tank with water. Purge the air from the tank and the piping by opening the cold and hot water faucets in the house.
13. Return the temperature control to the setting noted in Step 2.

VII. Troubleshooting

PROBLEM	CAUSE	SOLUTION
No hot water at faucets	Boiler does not operate.	Press reset button Check main cut-off switch Check fuses or breakers. Check power supply Check shaft coupling
	Circulator does not operate	Check shaft coupling
	Improper thermostat setting	Turn thermostat to a higher setting.
	Zone valve does not open	Check power supply and valve
	Electrical problem	Check fuses and replace. Check circuit breaker and reset. Check power supply
	Sediment and/or scale buildup	If boiler, circulator, and thermostat are operating properly, and the boiler is cycling on the high limit several times before the tank thermostat is satisfied, the coil may have a coating of sediment and/or scale. See chemical cleaning instructions.
	Clogged filter	Clean or replace filter.
Insufficient or runs out of hot water at the faucet	Thermostat setting too low.	Turn the thermostat to a higher setting.
	Undersized boiler with no priority to domestic water heating.	Rewire for priority.
	Peak draw of hot water is greater than the tank storage.	Determine peak usage and compare to tank volume.
	Sediment and/or scale buildup	Clean coil
	Faulty water heater thermostat	Replace thermostat
Water at faucet too hot	Thermostat set to high	Lower thermostat setting.
	Improper system plumbing	Compare plumbing to installation guide. Inspect check valves.
	Improper wiring.	Compare wiring to installation guide.
Boiler cycles more than 5 times per day in summer	Excessive demand	Reduce demand or consider larger boiler and/or water heater.
	Faulty thermostat	Replace thermostat
	Boiler high limit set to low	Increase boiler hi-limit setting
	Sediment and or scale buildup	Clean coil.



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