

CHAPTER 1 - PRE-INSTALLATION

1.1. Codes Compliance

Water heater installation must conform with the instructions in this manual and where applicable:

- local, state, provincial, and national codes, laws, regulations and ordinances.
- in Canada - CAN / CGA B149.1 or B149.2 Installation Code.

GINIUS water heaters are exempt from ASME Section VIII, Division 1 Code construction per Interpretation VIII-86-136. Check with local codes for applicability.

NOTICE

GINIUS Series water heaters will absorb less than 200,000 BTU/hr when domestic water outlet temperature is 210°F and boiler water supply temperature is 240°F. Listed outputs are based on ASME Section VIII Interpretation VIII-1-86-136.

Where recommendations in this manual differ from local, or national codes, the local or national codes take precedence.

1.2. Codes Restrictions

Single wall heat exchanger in the GINIUS water heater complies with National Standard Plumbing Code, provided that:

- Boiler water (including additives) is practically non-toxic, having toxicity rating or class of 1, as listed in Clinical Toxicology of Commercial Products, and
- Boiler water pressure is limited to maximum 30 psig by approved relief valve.

Single wall heat exchangers are permitted under the Uniform Plumbing code - Paragraph L3.2. and L3.3 if they satisfy all of the following requirements.

1. The heat transfer medium is potable water or contains only substances which are recognized as safe by the U.S. Food and Drug Administration.
2. The pressure of the heat transfer medium is maintained less than the normal minimum operating pressure of the potable water system

Exception: Steam complying with section #1 above.

3. The equipment is permanently labeled to indicate that only additives recognized as safe by the FDA shall be used in the heat transfer medium.

Other heat exchanger designs may be permitted where approved by the Administrative Authority.

1.3. Operating Restrictions

- Maximum domestic hot water temperature is 194°F for commercial applications and 140°F for residential applications.
- Maximum boiler water temperature is 210°F.
- Maximum working pressure for (domestic water) tank is 150 psig.
- Maximum working pressure for the heat exchanger (boiler water) tank is 80 psig.
- Water quality limitations (based on E.P.A National Secondary Drinking Water Regulations):
 - Chloride, less than 150 ppm or mg/l
 - pH value min. 6, max. 8
 - Total hardness 3 - 7 grains/gallon or 50-120 ppm or mg/l.
 - Total Dissolved Solids (TDS), less than 120 ppm or mg/l.
 - Iron less than 0.3 ppm or mg/l.
 - Aluminum, less than 0.2 ppm or mg/l.
 - Copper, less than 1 ppm or mg/l.
 - Manganese, less than 0.05 ppm or mg/l.
 - Zinc, less than 5 ppm or mg/l.

BEST PRACTICE

In hard water areas (more than 7 grains of hardness) soften the cold domestic supply water to the appliance to prevent scaling.

NOTICE

- Any water conditioning system must be installed and maintained in accordance with manufacturer's specifications.
- Do not install the water heater on any application if the boiler piping contains non-oxygen barrier tubing or if the boiler piping is considered an "open system". Exposing the tank of the water heater to oxygen contamination will lead to premature tank failure and denial of the warranty.

1.4. Locating Water Heater

- This water heater is not intended for outdoor installations.
- Keep distance between boiler and water heater to a minimum to:
 - Reduce piping heat loss
 - Provide minimal friction loss
- Locate water heater so that any leakage from the tank or water connections will not cause damage to the area adjoining the water heater or to lower floors in the structure.
 - When such a location is unavoidable, a suitable drain pan with adequate drainage, should be placed under the water heater.
- The GINIUS Series Water Heaters are designed for vertical installation only.

1.5. Recommended Clearances

Water heater should be installed to allow adequate clearance for servicing.

Zero clearance is permissible to any side of the GINIUS Series water heater that has no connection, but information labels may be hidden. Also take into account the clearance required for any accessory that needs to be installed on the heating and/or domestic circuits.

BEST PRACTICE

- *Recommended top or vertical clearance is 12" minimum.*
- *Refer to boiler manual for boiler clearances.*

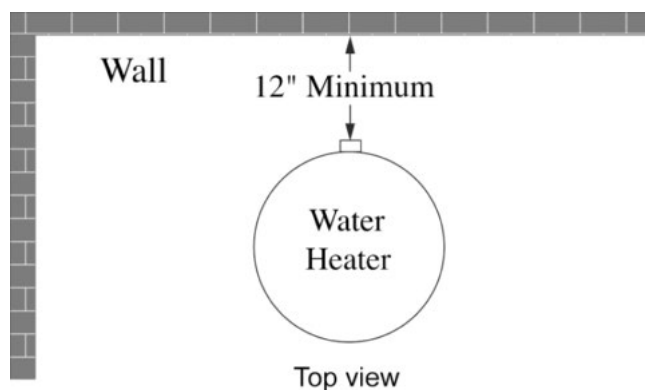


Fig. 2 - GINIUS - Clearances

2.1. Temperature & Pressure (T&P) Relief Valve

CAUTION

To reduce risk of excessive pressures and temperatures in the water heater, install temperature and pressure protective equipment required by local codes, but no less than a combination temperature and pressure 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 Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22. This valve must be marked with a maximum working pressure of the water heater.

- Every GINIUS water heater must be protected with a T&P relief valve.
- Determine T&P relief valve size by the following specifications, unless they conflict with local codes:
 - GINIUS 35/45/55: 3/4"NPT with an AGA Rating of 100,000 BTU/hr and a maximum pressure rating of 150 psig. (Watts 100XL or equivalent).
 - GINIUS 65: 3/4"NPT with an AGA Rating of 200,000 BTU/hr and a maximum pressure rating of 150 psig. (Watts 40XL or equivalent).

2.2. Standard Installation

- Install T&P relief valve in the **Auxiliary** connection located on the right side of the water heater top cap (Refer to *Fig 3 below and Fig. 5 on page 7*).

2.3. T&P Relief Valve Discharge Piping

- **T&P relief valve discharge piping must be:**
 - Made of material serviceable for temperatures of 250°F or greater.
 - Directed so that hot water flows away from all persons.
 - Directed to a suitable place for disposal.
 - Installed so as to allow complete draining of the T&P relief valve and discharge line.
- **T&P relief valve discharge piping must not be:**
 - Excessively long. Using more than 2 elbows or 15 feet of piping can reduce discharge capacity.
 - Directly connected to a drain. Terminate discharge piping within 6" from drain. Refer to local codes.
 - Plugged, reduced or restricted.
 - Subject to freezing.

WARNING

Do not install any valve between T&P relief valve and tank connection or on T&P relief valve discharge piping. Do not plug T&P relief valve or discharge piping. Improper placement and piping of T&P relief valve can cause substantial property damage, serious injury, or death.

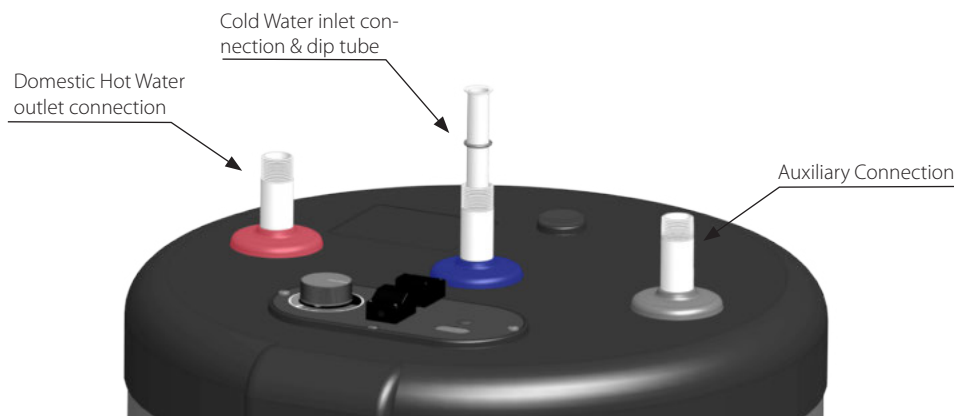


Fig. 3 - GINIUS Domestic Connection Arrangement

2.4. Drain Valve

Drain valve and fittings are supplied by others.

Standard Installation

- Install a drain valve at the domestic water drain connection (Refer to *Fig. 1 on page ix*).
- Pipe the drain piping with drain valve from the drain connection to:
 - a suitable place for disposal
 - or
 - terminate within 12" of the floor

2.5. Thermal Expansion

If a backflow preventer, check valve or pressure reducing valve is piped on cold water supply piping of water heater, install an expansion tank on cold water supply line to prevent normal thermal expansion from repeatedly forcing open T&P relief valve.

CAUTION

T&P relief valve is not intended for constant duty, such as relief of pressure due to repeated normal system expansion. Correct this condition by installing a properly sized expansion tank in domestic water system.

Refer to expansion tank manufacturer's installation instructions for proper sizing.

2.6. Water Hammer

Dishwashers, clothes washers and fast-closing positive shut-off valves incorporated in the system all contribute to creating water shock. Install a water hammer arrester to prevent damage to pipes and appliances. See device manufacturer's instructions for application and installation.

NOTICE

Water hammering within the domestic piping system can cause premature failure of the tank of the water heater. This type of failure is NOT covered under warranty.

2.7. Vacuum Breaker

Installing a vacuum breaker (Watts N36-M1 or equivalent) on the domestic cold water inlet will prevent damage to the tank if a negative pressure is developed in the domestic supply line. See manufacturer's instructions for application and installation of the vacuum breaker.

2.8. General Piping

- For domestic water piping diagram, see *Fig. 5 on page 7*.
- For Boiler water piping, see *Fig. 6 on page 8 thru Fig. 10 on page 10*.
- See *Table 1 on page 5* for domestic and boiler piping connection sizes.
- All plumbing must meet or exceed all local, state and national plumbing codes.
- Use pipe dope or tape suitable for potable water systems
- Use isolation valves to isolate system components.

2.9. Domestic Piping

- Union on the domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining the water heater easier.
- Install unions for easy removal of water heater. It is recommended to use dielectric unions or couplings to protect hot and cold water fittings from corrosion when connecting dissimilar materials such as copper and galvanized iron pipe.
- If copper pipe is used for domestic water connections, first solder pipe to a threaded adapter and then screw adapter into cold water inlet on top of water heater. Inlet connection contains an internal plastic dip tube which can be damaged by heat from soldering.

NOTICE

Do not apply heat to the cold water inlet when making sweat connections to water heater. Sweat tubing to adapter before fitting adapter to cold water inlet of heater. It is imperative that no heat be applied to the cold water inlet, as it contains a non metallic dip tube.

- When the water supply pressure is higher than 70 psig, it is recommended to install a pressure reducing valve on cold water supply line to prevent water loss through T&P relief valve.
- If the water heater will replace a tankless coil in the boiler, disconnect the piping to coil and allow the water to drain from coil. Do not plug the tankless coil.



Plugging tankless coil inlet and outlet will result in substantial property damage, serious injury, or death.

2.10. Thermostatic Mixing Valve

- It is recommended to install an optional mixing valve on the domestic hot water outlet.
- Mixing valve must comply with ASSE 1017 Recirculation Piping
- A stainless steel or bronze circulator is required on potable water systems.
- Install an automatic mixing valve either at the hot water outlet of water heater or each hot water faucet.

2.11. Multiple Water Heater Systems

- For multiple water heater domestic and boiler piping, see *Fig. 11 on page 10* and *Fig. 12 on page 11*.
- Install an automatic mixing valve either at the hot water outlet of water heater or each hot water faucet.



Failure to install automatic mixing valve where recommended will result in serious injury, or death.

2.12. Boiler Piping

- If plastic pipe is used for boiler water piping, it must have a maximum oxygen diffusion rate of 0.1 mg/liter-day for boiler and water heater protection.

NOTICE

The GINIUS IDWH must be installed on a closed type hydronic system. Failure to provide such a system will result in premature failure of the tank and annulment of warranty.

- Boiler water (including additives) must be practically non-toxic, having toxicity rating or class of 1, as listed in Clinical Toxicology of Commercial Products.

CAUTION

Antifreeze can only be used if the boiler water pressure relief valve is set to 30 psig or below.

If antifreeze is used in the boiler system, local codes may require a backflow preventer on cold water supply line. Use antifreeze specifically intended for hydronic heating systems. Inhibited propylene glycol is recommended at a maximum 50/50 mixture.



Do not use automotive, ethylene glycol or petroleum-based antifreeze. Do not use any undiluted antifreeze. This can cause substantial property damage, serious injury, or death.

Table 1 - Piping dimensions

Water Heater Model	Connections				Recirculation Dip Tube		Dip Tube		Recommend- ed Minimum Boiler Piping
	Domestic Water Inlet/Outlet (NPT)	Boiler Water Supply/ Return (NPSC)	Auxiliary Connection (NPT)	Domestic Drain Connection (NPSC)	Length (Inches)	Diameter (Inches)	Length (Inches)	Diameter (Inches)	Diameter (Inches)
GINIUS 35	3/4	1	3/4	3/4	25	3/4	43	3/4	1
GINIUS 45	3/4	1	3/4	3/4	25	3/4	52	3/4	1
GINIUS 55	3/4	1	3/4	3/4	34	3/4	62	3/4	1
GINIUS 65	3/4	1	3/4	3/4	34	3/4	71	3/4	1

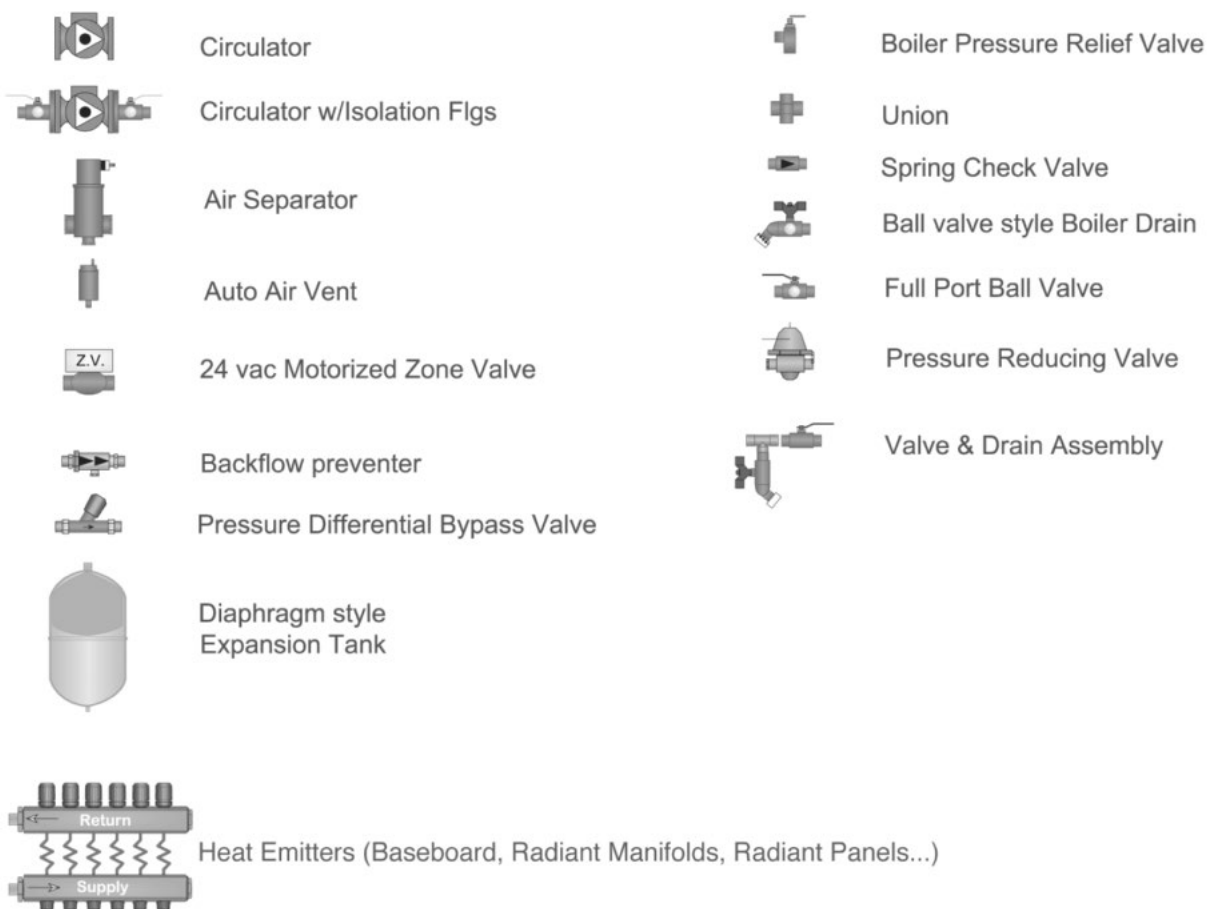


Fig. 4 - Piping Components Legends

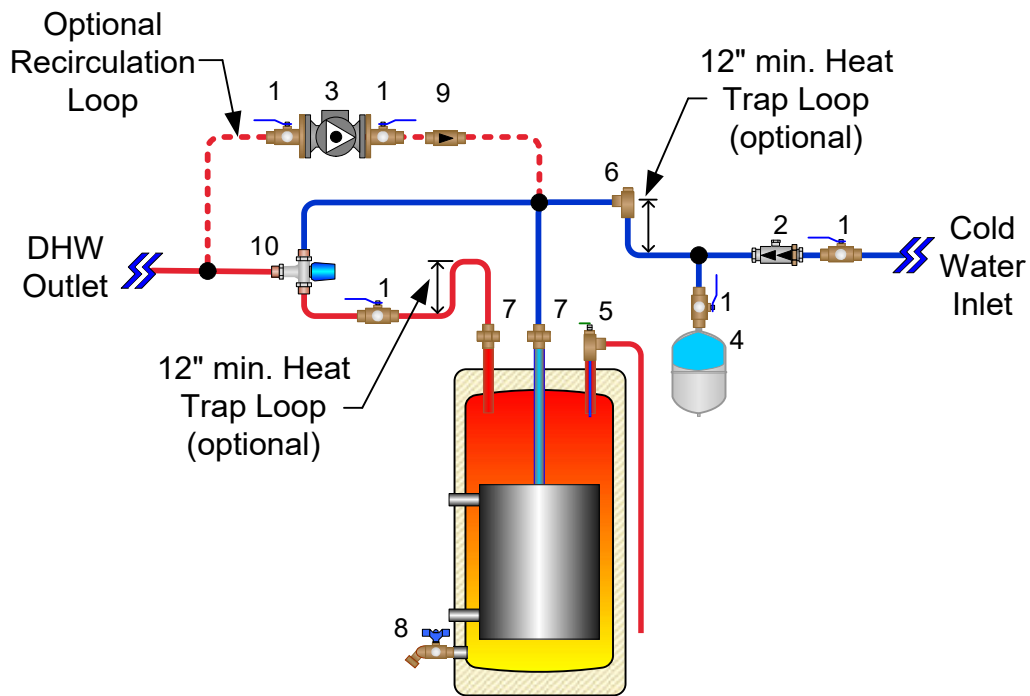


Fig. 5 - Standard Installation Domestic Piping with optional Recirculation - GINIUS Series

1. Isolation valve
2. Backflow preventer or Pressure reducing valve (*)
3. Circulator
4. Thermal expansion tank (potable)
5. T&P relief valve
6. Vacuum Breaker

7. Unions
8. Drain valve
9. Check valve
10. Thermostatic mixing valve

(*) Optional devices may be required by local codes

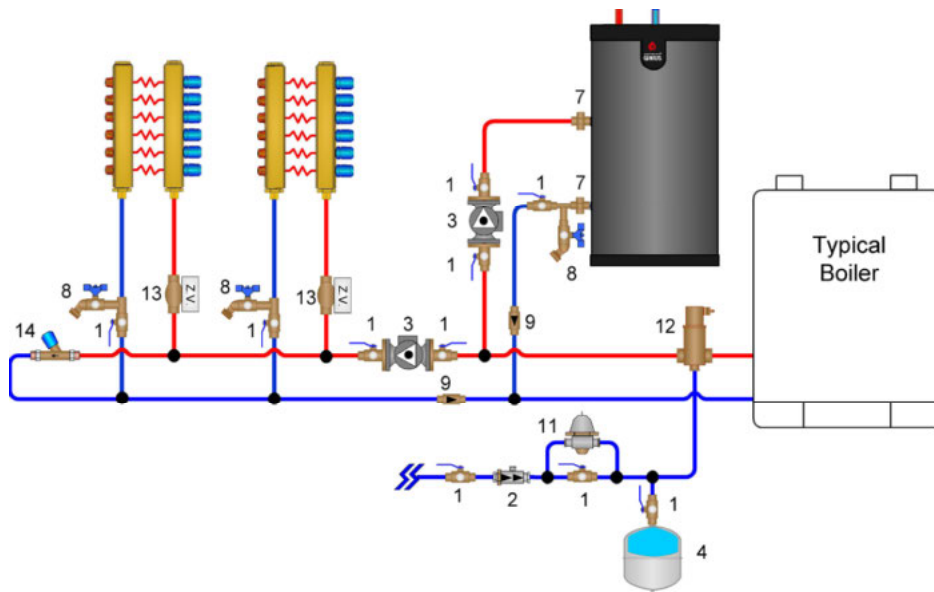


Fig. 6 - GINIUS System Piping with Zone Valves (Domestic Priority)

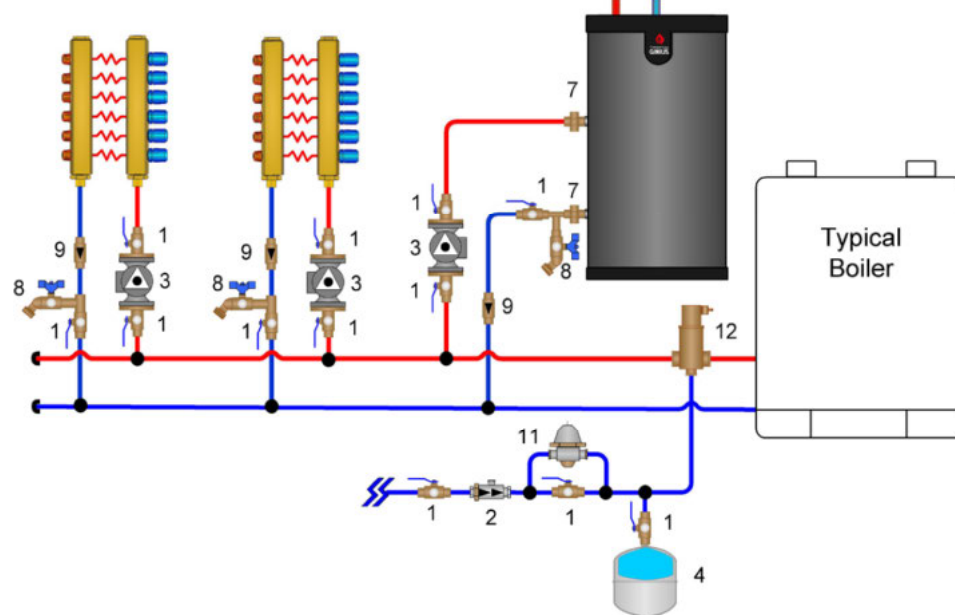


Fig. 7 - GINIUS System Piping with Zone Circulators

- | | |
|-------------------------------------|--|
| 1. Isolation valve | 8. Drain valve |
| 2. Backflow preventer (*) | 9. Check valve |
| 3. Circulator | 10. Thermostatic mixing valve |
| 4. Thermal expansion tank (potable) | 11. Pressure reducing valve |
| 5. T&P relief valve | 12. Air separator |
| 6. Vacuum Breaker | 13. Zone valve |
| 7. Unions | 14. Pressure Differential Bypass Valve |

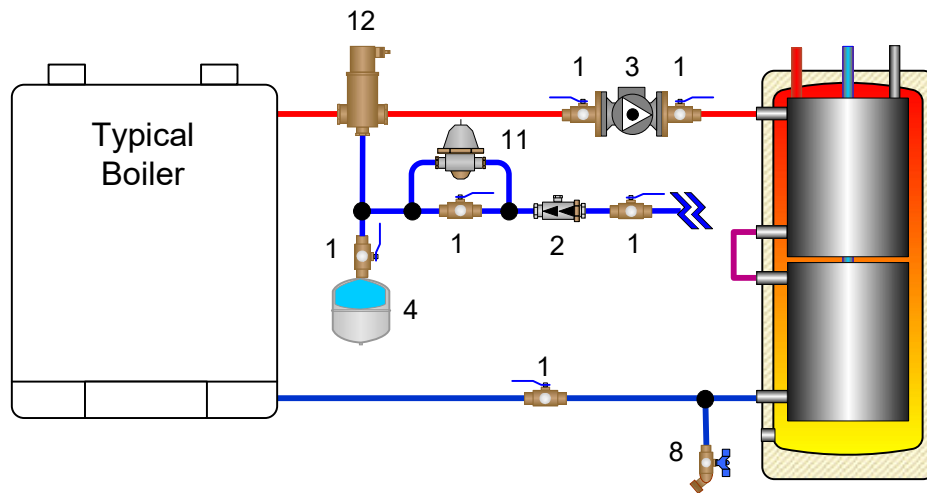


Fig. 8 - Dual Heat Exchanger GINIUS 65 Water Heater System Boiler Piping - Standard Installation in Series

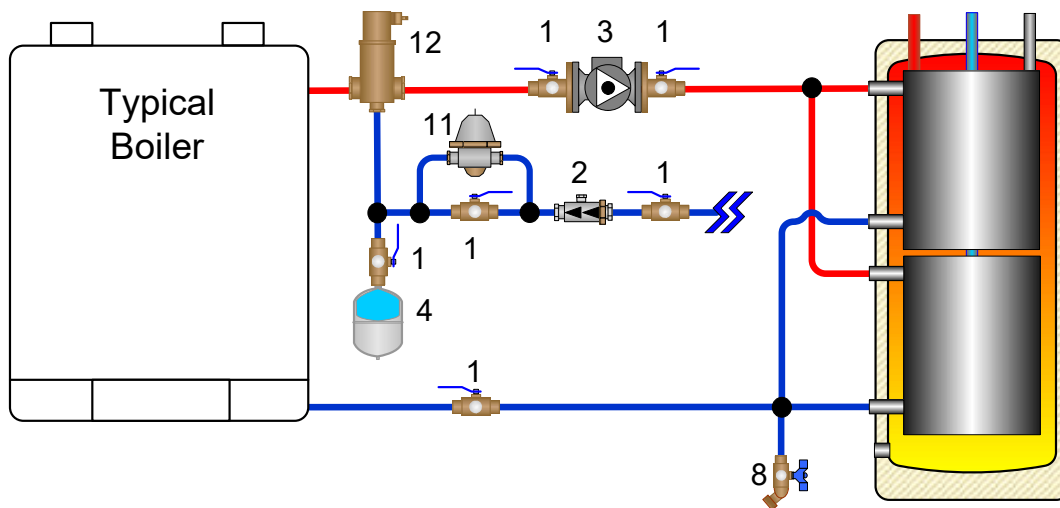


Fig. 9 - Dual Heat Exchanger GINIUS 65 Water Heater System Boiler Piping - For Flow Rates above 14 GPM - Installation in Parallel

- | | |
|-------------------------------------|--|
| 1. Isolation valve | 8. Drain valve |
| 2. Backflow preventer (*) | 9. Check valve |
| 3. Circulator | 10. Thermostatic mixing valve |
| 4. Thermal expansion tank (potable) | 11. Pressure reducing valve |
| 5. T&P relief valve | 12. Air separator |
| 6. Vacuum Breaker | 13. Zone valve |
| 7. Unions | 14. Pressure Differential Bypass Valve |

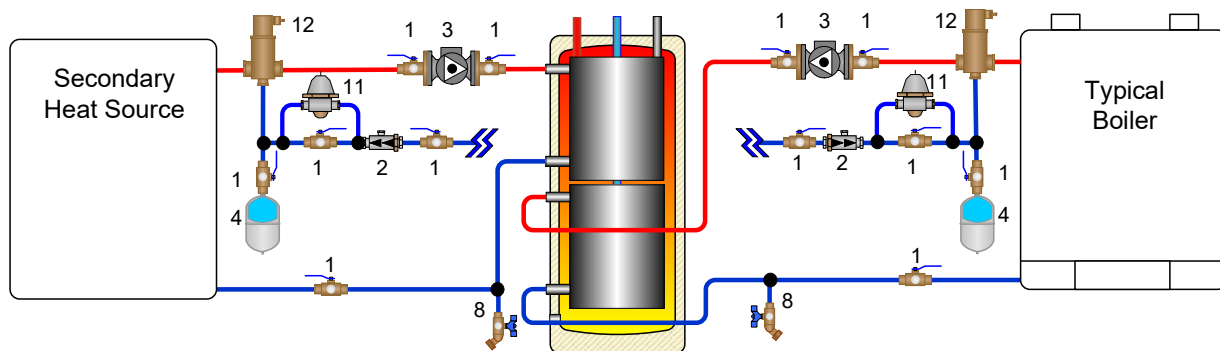


Fig. 10 - GINIUS Series Water Heater System boiler Piping - Multi Power Sources

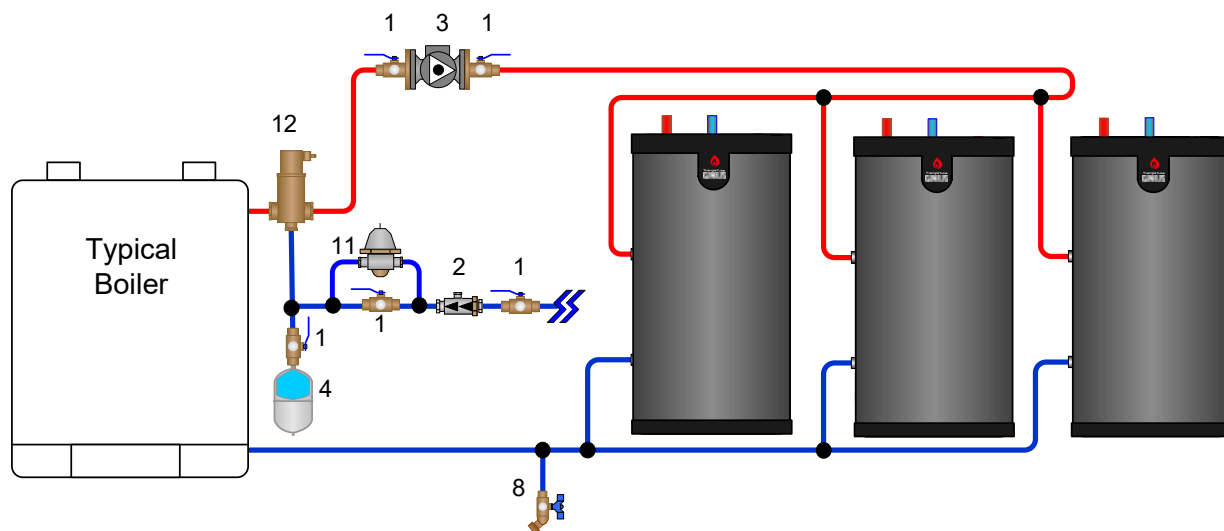


Fig. 11 - Multiple GINIUS Series Water Heater System Boiler Piping - Reverse Return Balanced Flow

- | | |
|-------------------------------------|--|
| 1. Isolation valve | 8. Drain valve |
| 2. Backflow preventer (*) | 9. Check valve |
| 3. Circulator | 10. Thermostatic mixing valve |
| 4. Thermal expansion tank (potable) | 11. Pressure reducing valve |
| 5. T&P relief valve | 12. Air separator |
| 6. Vacuum Breaker | 13. Zone valve |
| 7. Unions | 14. Pressure Differential Bypass Valve |

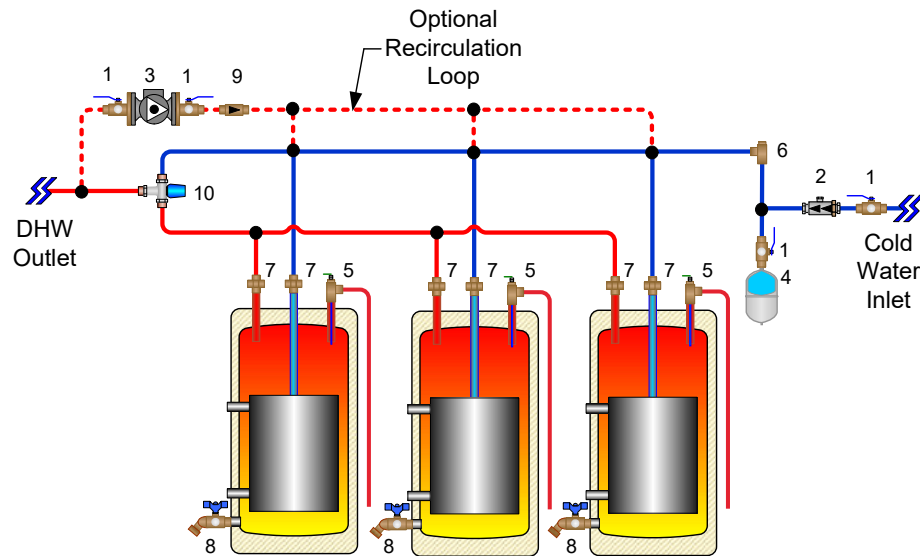


Fig. 12 - Multiple GINIUS Series Water Heater System Domestic Piping - Parallel

- | | |
|--|---|
| 1. Isolation valve | 7. Unions |
| 2. Backflow preventer or Pressure reducing valve (*) | 8. Drain valve |
| 3. Circulator | 9. Check valve |
| 4. Thermal expansion tank (potable) | 10. Thermostatic mixing valve |
| 5. T&P relief valve | |
| 6. Vacuum Breaker | (*) Optional devices may be required by local codes |

INTENTIONALLY LEFT BLANK

CHAPTER 3 - INSTALLATION - WIRING

3.1. Wiring Requirements



Electrical shock hazard can cause substantial property damage, serious injury, or death. Disconnect power before installing and/or servicing.

1. All wiring must be a minimum of 18 gauge and installed in accordance with:
 - U.S.A. - National Electrical Code and any other national, state or local code requirements having jurisdiction.
 - Canada - C.S.A. C22.1 Canadian Electrical Code Part 1 and any other national, provincial and local code requirements having jurisdiction.
2. If original wire supplied with appliance must be replaced, Type 90°C or its equivalent must be used.
3. Refer to control component instructions packed with boiler for application information.
4. An optional service switch may be installed in water heater electrical circuit. This switch would only shut off the water heater, not the home heating system. Do not shut off water heater if there is a chance of freezing.
5. All electrical contacts shown do not have power applied - off the shelf condition. *See pages 14 thru 17.*

3.2. Circulators

Priority relay must be sized for total amp draw of all circulators.

3.3. Zone Valves

Transformer must be sized for maximum load of all zone valves.

3.4. Snap Set Connection

For easy wiring between water heater thermostat and boiler controls see wiring diagrams in following pages (refer to *Fig. 14 on page 14* thru *Fig. 20 on page 17*).

Make sure snap set is firmly snapped together after wiring.

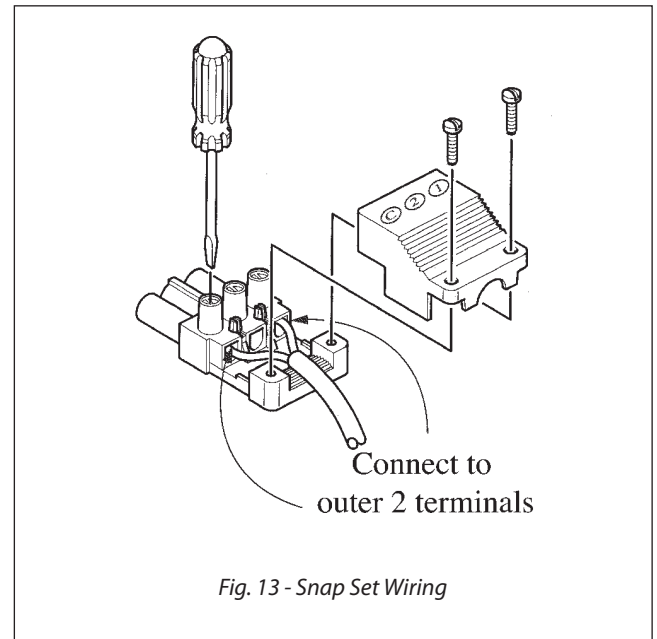


Fig. 13 - Snap Set Wiring

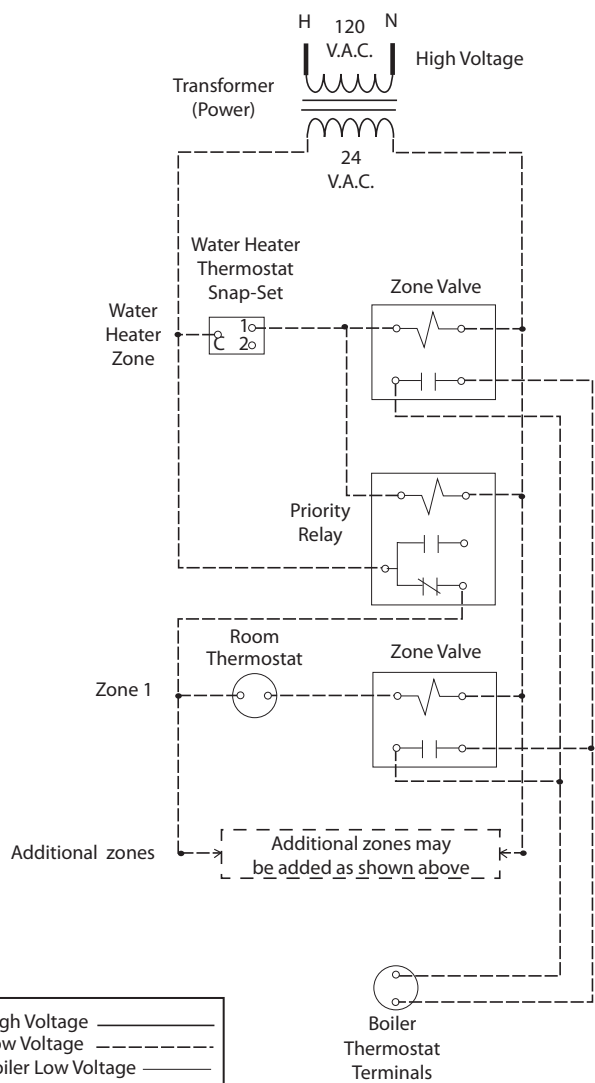


Fig. 14 - Typical 4-wire Zone Valve Zoning, with Domestic Priority

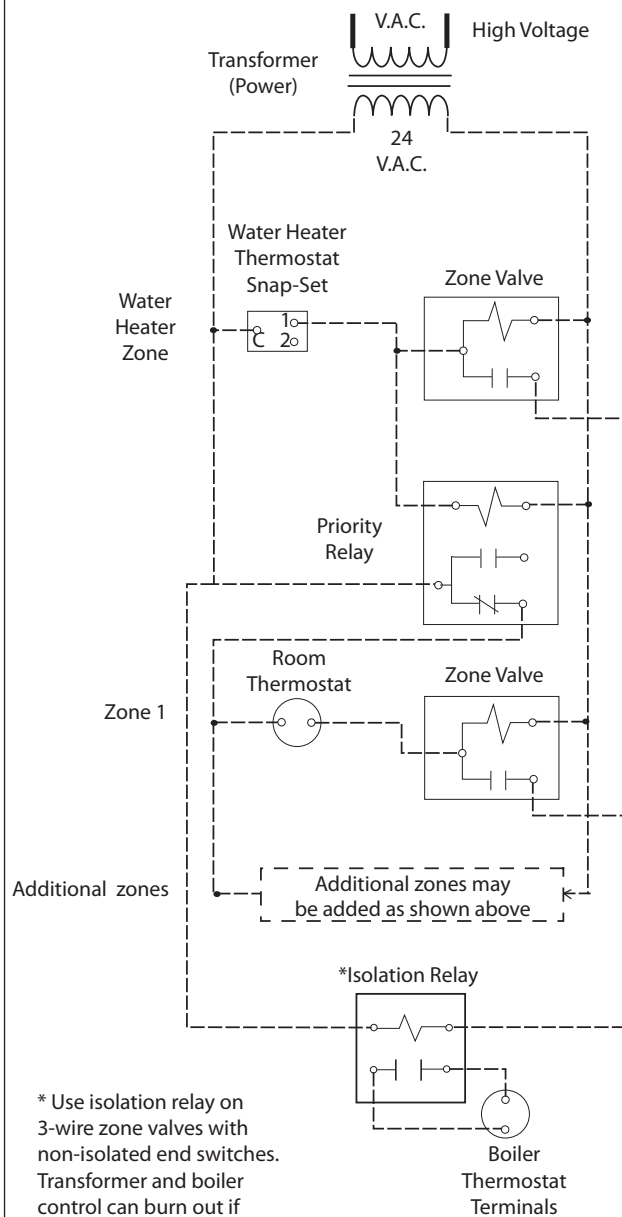
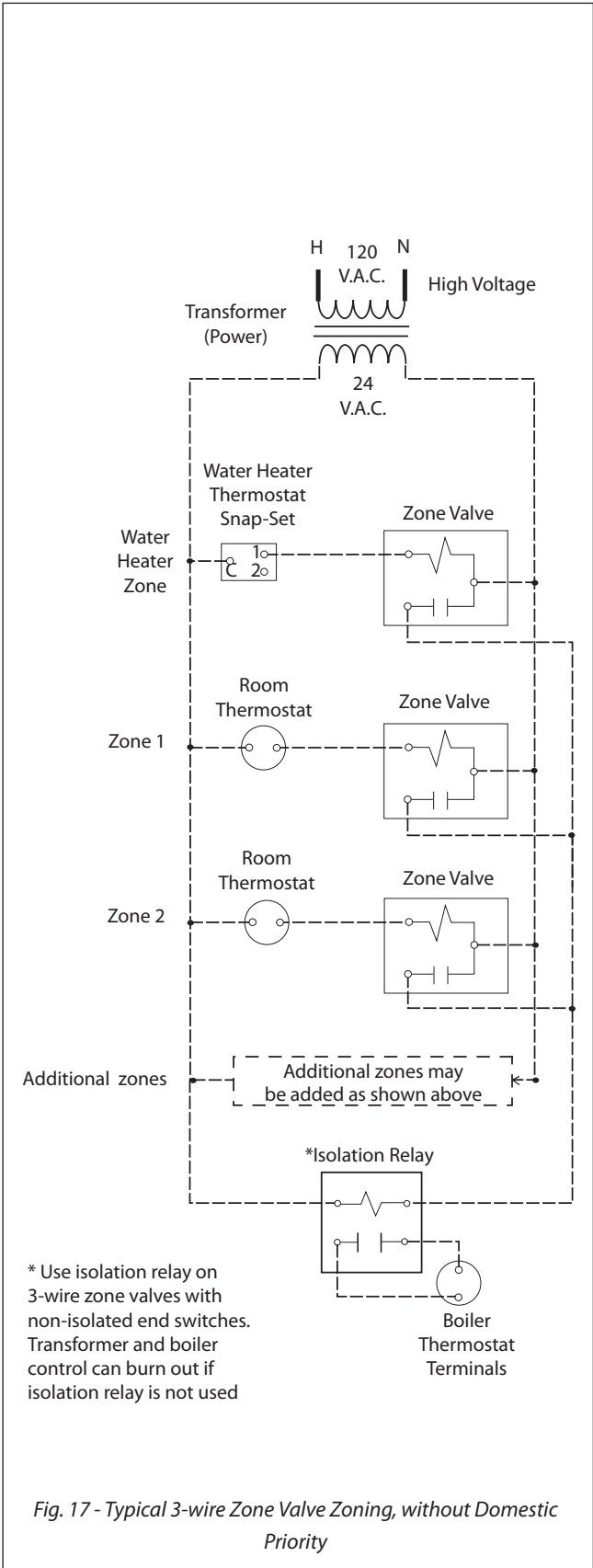
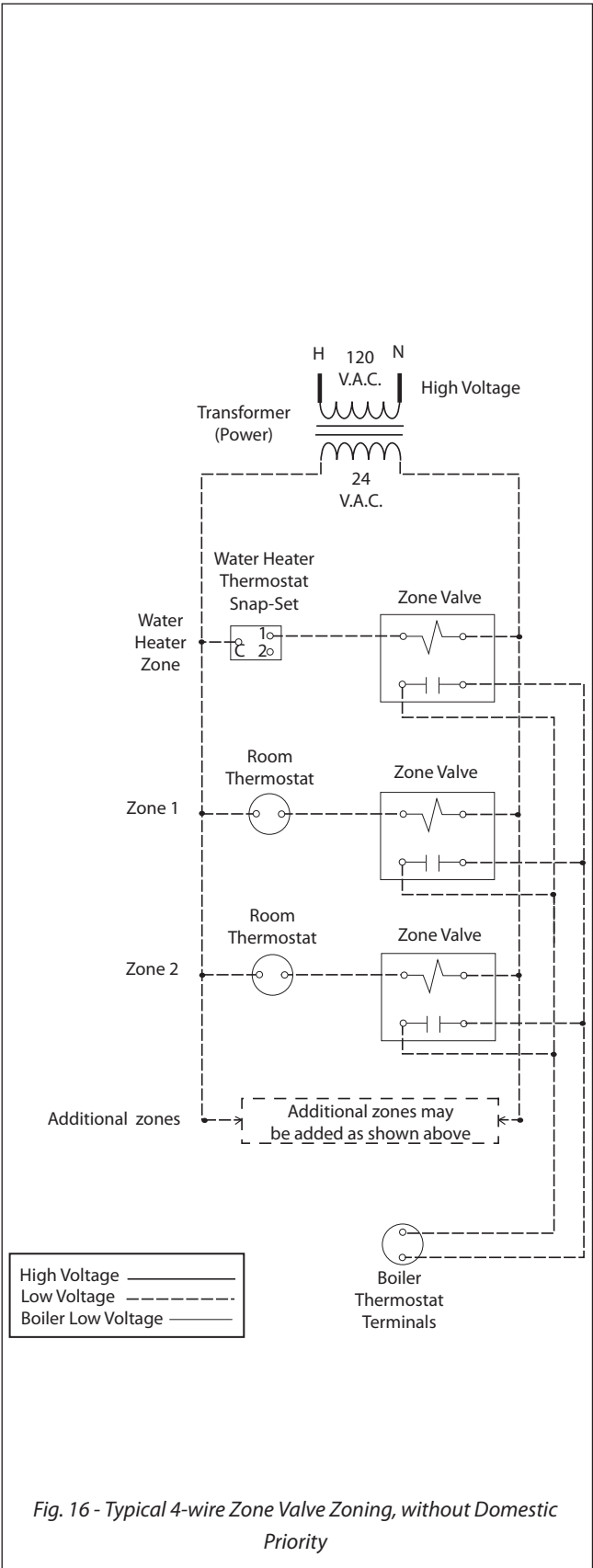


Fig. 15 - Typical 3-wire Zone Valve Zoning, with Domestic Priority



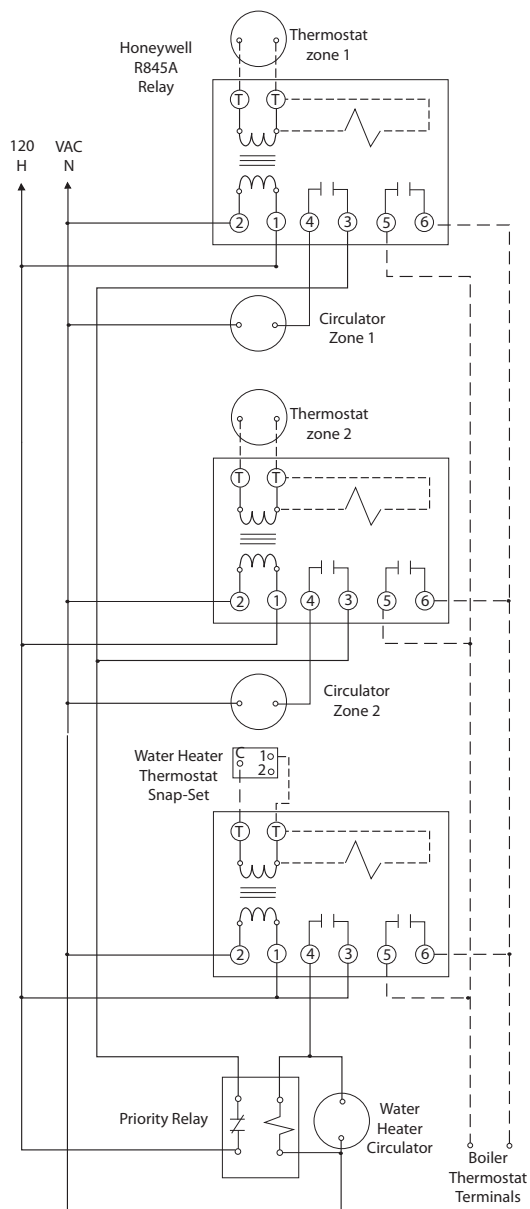


Fig. 18 - Typical Circulator Zoning with Domestic Priority

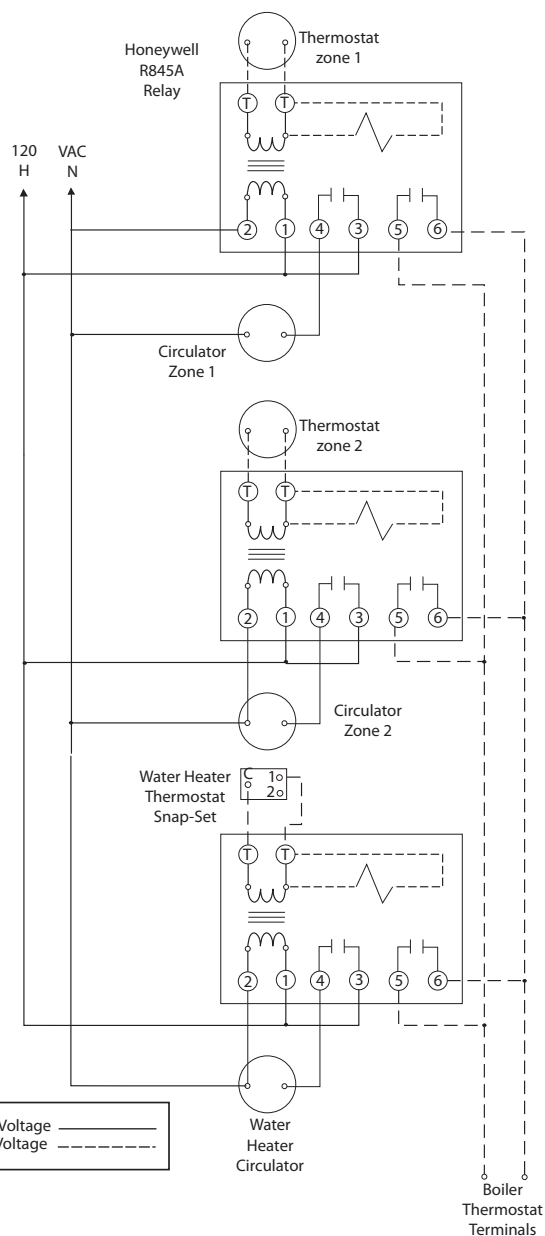


Fig. 19 - Typical Circulator Zoning without Domestic Priority

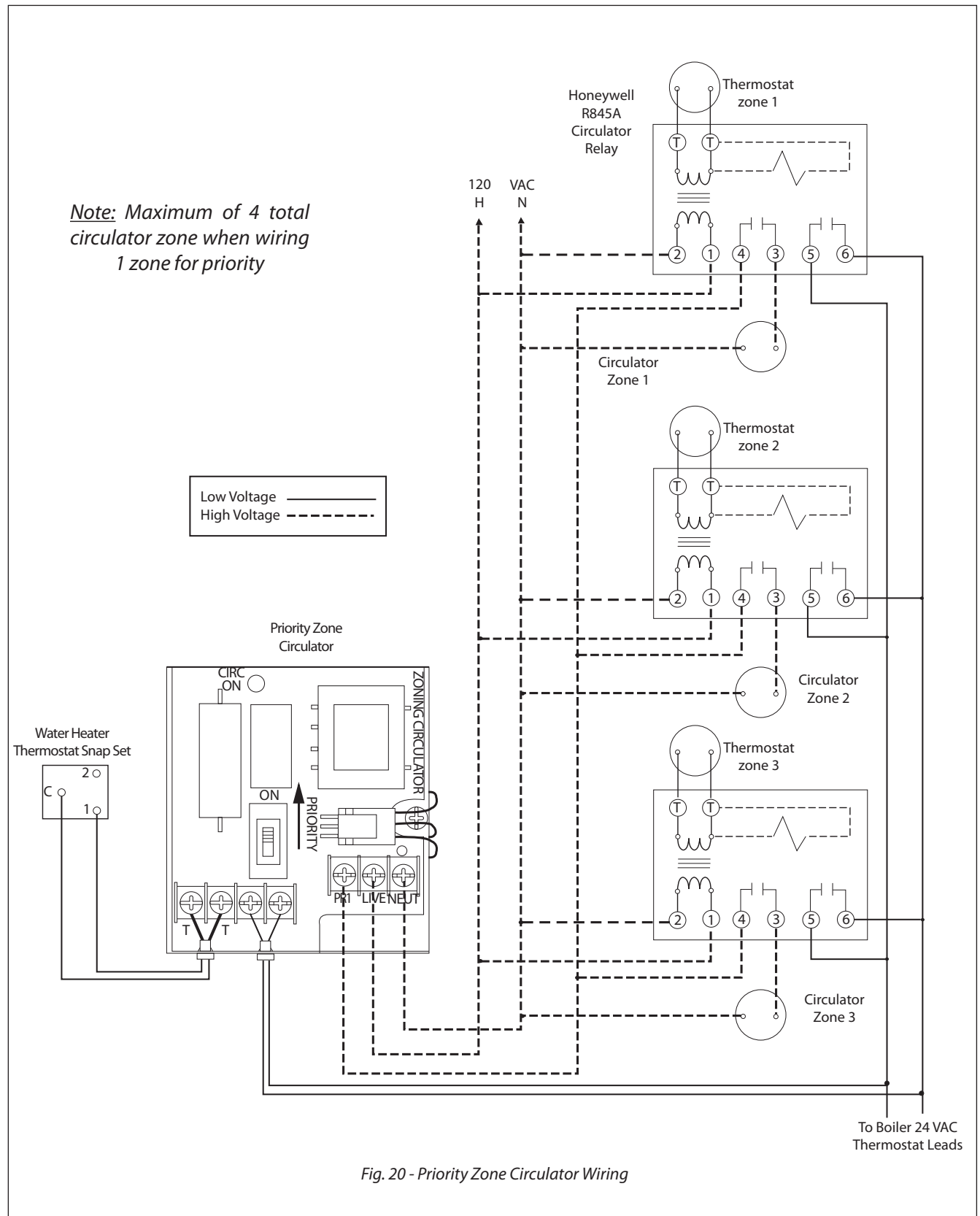


Fig. 20 - Priority Zone Circulator Wiring

INTENTIONALLY LEFT BLANK

4.1. Filling the primary (Boiler Water) circuit

CAUTION

- Never use the water heater unless primary (Boiler water) circuit and (Domestic water) tank are completely filled with water.
 - Primary circuit must be completely filled and pressurized before pressurizing tank.
1. Close boiler water drain valve at boiler water outlet of water heater.
 2. Open water heater's boiler water isolation valves.
 3. Follow instructions furnished with boiler to fill with water and vent the primary (boiler water) circuit.

CAUTION

Antifreeze can only be used if the boiler water pressure relief valve is set to 30 psig or below.

4. If antifreeze is used in boiler water, check concentration. Boiler water (including additives) must be practically non-toxic, having toxicity rating or class of 1, as listed in Clinical Toxicology of Commercial Products.

WARNING

Do not use automotive, ethylene glycol or petroleum-based antifreeze. Do not use any undiluted antifreeze. This can cause substantial property damage, serious injury, or death.

4.2. Filling the (Domestic Water) Tank

CAUTION

- Never use the water heater unless primary (Boiler water) circuit and (Domestic water) tank are completely filled with water.
 - Primary circuit must be completely filled and pressurized before pressurizing tank.
1. Close domestic water drain valve.
 2. Open domestic water isolation valves for water heater.
 3. Vent air from (domestic water) tank by opening nearest hot water faucet. Fill domestic water tank completely by allowing water to run until there is a constant flow of water.
 4. Close hot water faucet.

⚠ DANGER

HOT WATER CAN SCALD!

Water temperature over 125°F can cause severe burns instantly or death from scalds.



- Feel water before bathing or showering.
- Consumer Product Safety Commission and some states recommend temperatures settings of 130°F or less. Setting thermostat higher than 130°F will increase risk of scald injury and cause severe personal injury or death.
- Water heated to a temperature suitable for clothes washing, dish washing and other sanitizing needs will scald and cause permanent injury.
- Children and elderly, infirm, or physically handicapped persons are more likely to be injured by hot water. Never leave them unattended in or near a bathtub. If anyone using hot water in the building fits this description, or if state laws or local codes require certain water temperatures at hot water faucets, take special precautions.
 - Install an automatic mixing valve at water heater or at each hot water faucet, bath and shower outlet. Selection and installation must comply with valve manufacturer's recommendation and instructions.
 - Use the lowest practical temperature setting.
 - Check water temperature after any adjustment. You must follow "Adjusting the Water Heater Thermostat" procedures.

⚠ WARNING

At no time should boiler limit control be set above 210°F. This can cause substantial property damage, serious injury, or death if ignored.

NOTICE

- Household water usage patterns will affect water temperature at any faucet or shower. Occasionally check temperature at each point of use, then adjust thermostat accordingly. Always recheck temperature after adjusting thermostat.

CAUTION

- When hot water is used in repeated small quantities, a "stacking" effect can develop in the water heater. The upper layer of water in tank can be hotter than lower layer, resulting in very hot water coming out at the faucet.
- It is therefore recommended to either lower the thermostat setting or install automatic mixing valves as indicated in these instructions in order to reduce water temperature levels. Consult your installer or service technician.

4.3. Adjusting the Water Heater Thermostat

Water heater thermostat is factory set to its lowest temperature. This may or may not be suitable for your needs.

- Turn thermostat knob **clockwise** to **increase** water temperature.
- Turn thermostat knob **counter-clockwise** to **decrease** water temperature.

WARNING

Bacteria can develop in the domestic water system if certain minimum water temperatures are not maintained. Failure to maintain at least 140°F [60°C] domestic hot water temperature (using the Antilegionella function of your boiler, if any) can result in bacteria development, which can result in serious injury, or death.

- Check water temperature at a hot water faucet immediately after first heating cycle. Further temperature adjustment may be necessary as water heating system is used. Recheck water temperature at faucet after adjustment.
- When adjusting thermostat, be sure boiler limit control is set a minimum of 20°F higher.

