



PLUS LINE

Indirect-Fired Water Heaters

- Installation • Start-Up • Usage
- Maintenance • Parts



Read all instructions before installing

Installer Leave this manual in the envelope and affix near the water heater. Consider piping and installation when determining water heater location. Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

User Read important user safety information found on pages 2 and 16. Installation and service should only be performed by a qualified service technician. Retain this manual for future reference.



Read this page first

Hazard definitions

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

DANGER

Indicates presence of hazards that will cause severe personal injury, death or substantial property damage.

WARNING

Indicates presence of hazards that can cause severe personal injury, death or substantial property damage.

CAUTION

Indicates presence of hazards that will or can cause minor personal injury or property damage.

NOTICE

Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

WARNING

Read all instructions before installing. Failure to follow all instructions in proper order can cause severe personal injury, death or substantial property damage.

WARNING

Studies have indicated that dangerous bacteria, including legionella pneumophila, can form in the potable water distribution system if certain minimum water temperatures are not maintained. Contact your local health department for more information.

DANGER

Hot Water Can Scald!

- Water heated to temperature for clothes washing, dish washing and other sanitizing needs can scald and cause permanent injury.
- Children, elderly, and infirm or physically handicapped persons are more likely to be permanently injured by hot water. Never leave them unattended in bathtub or shower. Never allow small children to use a hot water tap or draw their own bath.
- If anyone using hot water in the building fits the above description, or if state laws or local codes require certain water temperatures at hot water taps, you must take special precautions:
- Use lowest possible temperature setting.
- Install some type of tempering device, such as an automatic mixing valve, at hot water tap or water heater. Automatic mixing valve must be selected and installed according to valve manufacturer's recommendations and instructions.
- Water passing out of drain valves may be extremely hot. To avoid injury:
- Make sure all connections are tight.
- Direct water flow away from any person.

Protection Must Be Taken Against Excessive Temperature and Pressure!

- Installation of a Temperature & Pressure (T&P) relief valve is required.





Contents

A. Pre-installation

Codes	4
Location	4
Recommended clearances	4
Operating restrictions	5
Code restrictions	5

B. Water heater piping

Temperature & pressure relief valve	6
Air vent	6
Drain valve	7-10
Thermal expansion	11
Water hammer	11
General piping information	11
Domestic water piping	12
Boiler piping	12

C. Wiring

Water heater thermostat connection	13
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D. Water heater start-up

Filling the inner (domestic water) tank	14
Filling the outer (boiler water) tank	14
Start-up checklist	15

E. Adjusting water heater temperature

General notes	16
Setting the thermostat — GOLD Plus 30/40/60/80	17
Setting the thermostat — PLUS 100/120	17

F. Water heater maintenance

Maintenance schedule — annual service technician	18
Maintenance schedule — monthly homeowner	18
Filling	19
Draining	19
Draining inner (domestic water) tank	19
Draining outer (boiler water) tank	19

G. Water heater dimensions & specifications

GOLD Plus 30/40/60/80	20
Commercial PLUS 100/120	21

H. Replacement parts

GOLD Plus 30/40/60/80	22-23
Commercial PLUS 100/120	24-25

I. Piping appendix

Piping for dedicated water heating and combination systems	26-33
Piping with steam boilers	34-35
Recirculation and heat tracing	36-37

J. Wiring appendix

Typical wiring diagrams for water heating systems	38-51
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A

Pre-installation

Codes

- Installation must conform with instructions in this manual and, where applicable:
- local, state, provincial, and national codes, laws, regulations and ordinances.
 - in Canada — B149.1 or B149.2 Installation Code.

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

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

Location

This water heater is not intended for outdoor installation.

Select a convenient location for water heater, based on domestic and boiler piping hook-ups.

Keeping the distance between boiler and water heater short will:

- reduce piping heat loss.
- provide minimum friction loss.

Install water heater so if tank or any connections should leak, the water flow will not cause damage to area near water heater, or to lower floors of structure. When such locations cannot be avoided, install a suitable drain pan under water heater. Drain pans are available at your local plumbing supply store.

This product is designed for vertical installation only.

Recommended clearances

Installation location must provide adequate clearances for servicing and proper operation of the water heater.

GOLD Plus 30/40/60/80 (see Figure 1)

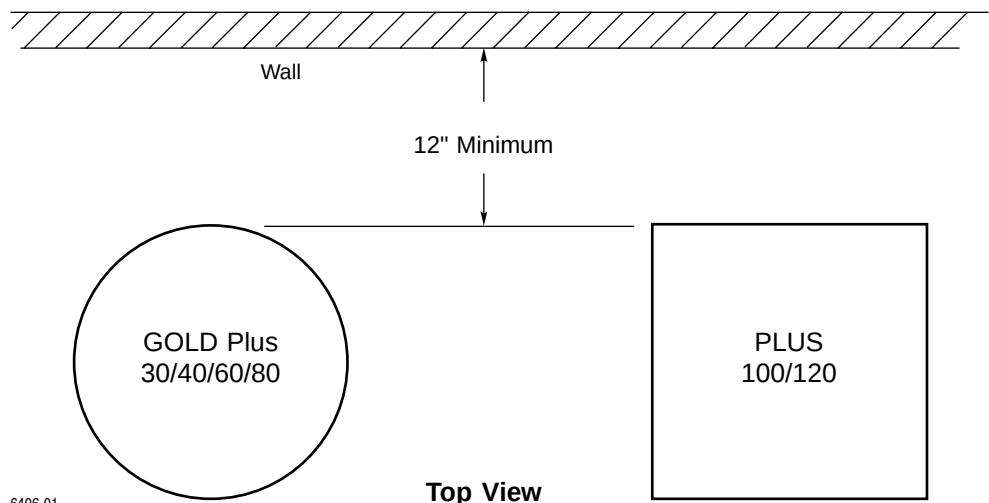
- Zero clearance is permissible to either side of water heater, but Instruction label may be hidden.
- Top (vertical) clearance is 12" minimum.
- Refer to boiler manual for boiler clearances.

PLUS 100/120 (see Figure 1)

- Zero clearance is permissible to either side of the water heater, but Instruction, Rating and CP Number labels may be hidden.
- Top (vertical) clearance is 12" minimum.
- Refer to boiler manual for boiler clearances.

Figure 1

Clearance recommendations



6406-01



Operating restrictions

- Maximum domestic hot water temperature (**Use only for special high-temperature operational requirements**):
 - 160°F for GOLD Plus 30/40/60/80.
 - 190°F for PLUS 100/120.
- Maximum boiler water temperature — 210°F.
- Maximum working pressure for inner (domestic water) tank — 150 psig.
- Maximum working pressure for outer (boiler water) tank — 45 psig.
- pH and chloride limits for water heaters are:
 - chloride — less than 80 mg/l.
 - pH — above 6 and less than 8.

Code restrictions

National Standard Plumbing Code

Single wall heat exchanger in 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.

Uniform Plumbing Code — Paragraphs L3.2 and L3.3

Single-wall heat exchangers are permitted 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 #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.



B Water heater piping

Temperature & pressure (T & P) relief valve

CAUTION

To reduce risk of excessive pressures and temperatures in 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.

1. Size T&P relief valve by the following specifications, unless they conflict with local codes:
 - GOLD Plus 30/40/60/80: 3/4" NPT with an AGA Rating of 100,000 BTU/hr, with a long element. Set to relieve at 150 psi. (Watts model 100XL-8 relief valve or equivalent.)
 - PLUS 100/120: 3/4" NPT with an AGA Rating of 200,000 BTU/hr, with a long element. Set to relieve at 150 psi. (Watts model 40XL-8 relief valve or equivalent.)

GOLD Plus and PLUS water heaters are exempt from ASME Section VIII per **Interpretation VIII-1-86-136**. Consult local codes for applicability.
2. Installing T&P relief valve –

GOLD Plus 30/40/60/80 (Page 7)

 - Install T&P relief valve either:
 - a. in tapping marked **AUX**.
 - b. in run (straight through leg) of tee located at domestic hot water outlet of water heater. (Required for the Commonwealth of Massachusetts.) Use a long element T&P relief valve.

PLUS 100/120 (Page 8)

 - Install T&P relief valve either:
 - a. in tapping marked **AUX**.
 - b. in run (straight through leg) of tee located at domestic hot water outlet of water heater. (Required for the Commonwealth of Massachusetts.) Use a long element T&P relief valve.
3. 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 floor. Refer to local codes.
 - plugged, reduced or restricted.
 - subjected 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 severe personal injury, death or substantial property damage.

Air vent

1. Remove plastic shipping cap from 1/2" NPT pipe fitting on top of water heater.
2. Install 1/2" x 1/8" reducer bushing provided with water heater, using suitable pipe dope or tape.
3. Install automatic air vent provided with water heater, using suitable pipe dope or tape.
4. Unscrew vent cap on air vent one full turn. Leave cap unscrewed one turn for normal venting.

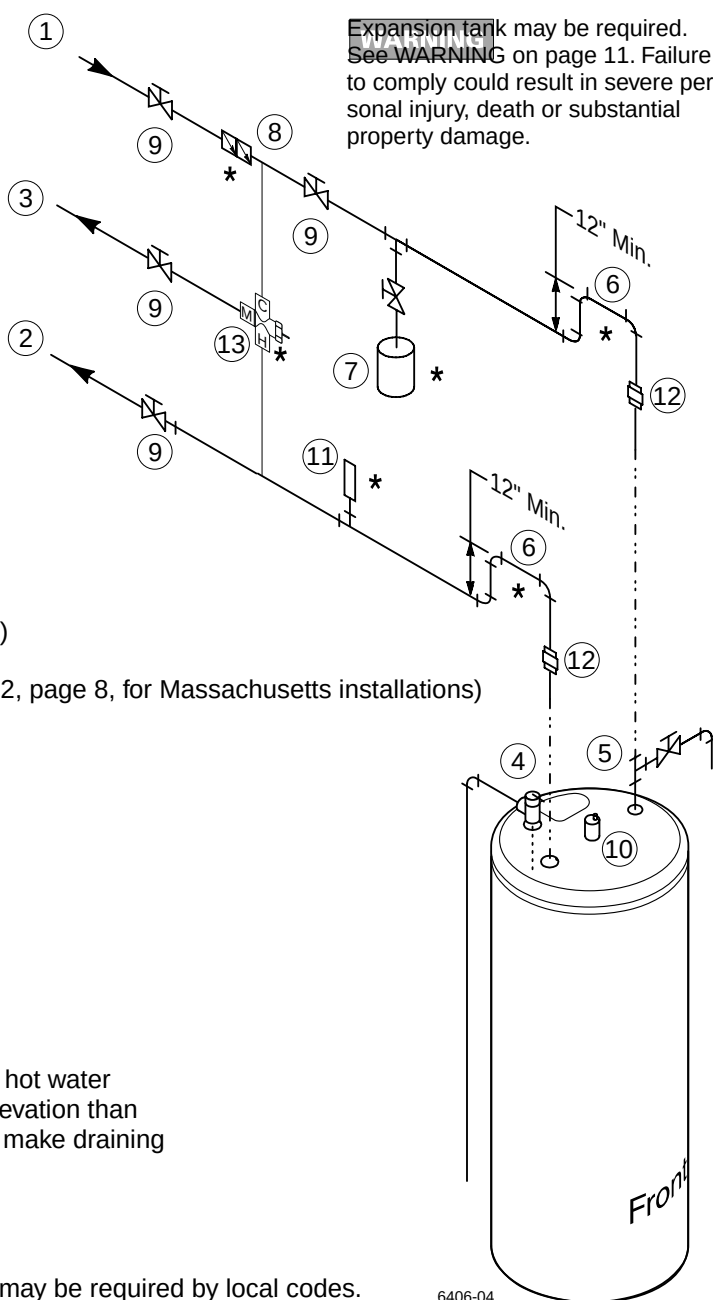


Figure 2

Piping — **Option 1**
GOLD Plus 30/40/60/80
(See Figure 3, page 8, for
Option 2, required for
Massachusetts)

- ① Cold water inlet
- ② Hot water outlet
- ③ Mixed water outlet
- ④ T & P relief valve (with long element)
- ⑤ Drain valve & brass tee (see Option 2, page 8, for Massachusetts installations)
- ⑥ Heat trap loop (12" minimum) *
- ⑦ Expansion tank (see page 11) *
- ⑧ Backflow preventer *
- ⑨ Shutoff valve, ¾" NPT
- ⑩ Automatic air vent
- ⑪ Shock arrester *
- ⑫ Union, ¾" NPT - Union on domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining water heater easier.
- ⑬ Mixing valve *

* Optional items shown with an asterisk may be required by local codes.



Drain valve GOLD Plus 30/40/60/80 Option 1

Apply the following and Figure 2 to water heaters other than those installed in Massachusetts. For Commonwealth of Massachusetts installations, see Option 2, Figure 3, page 8.

1. Install the ¾" NPT brass tee (supplied with water heater) in the domestic water inlet piping using suitable pipe dope or tape, located as shown in Figure 2.
2. Pipe the drain valve off of the brass tee as shown in Figure 2, using suitable pipe dope or tape.
3. For jurisdictions requiring a vacuum breaker, use the piping shown in Figure 3, page 8, (Option 2).

B Water heater piping continued

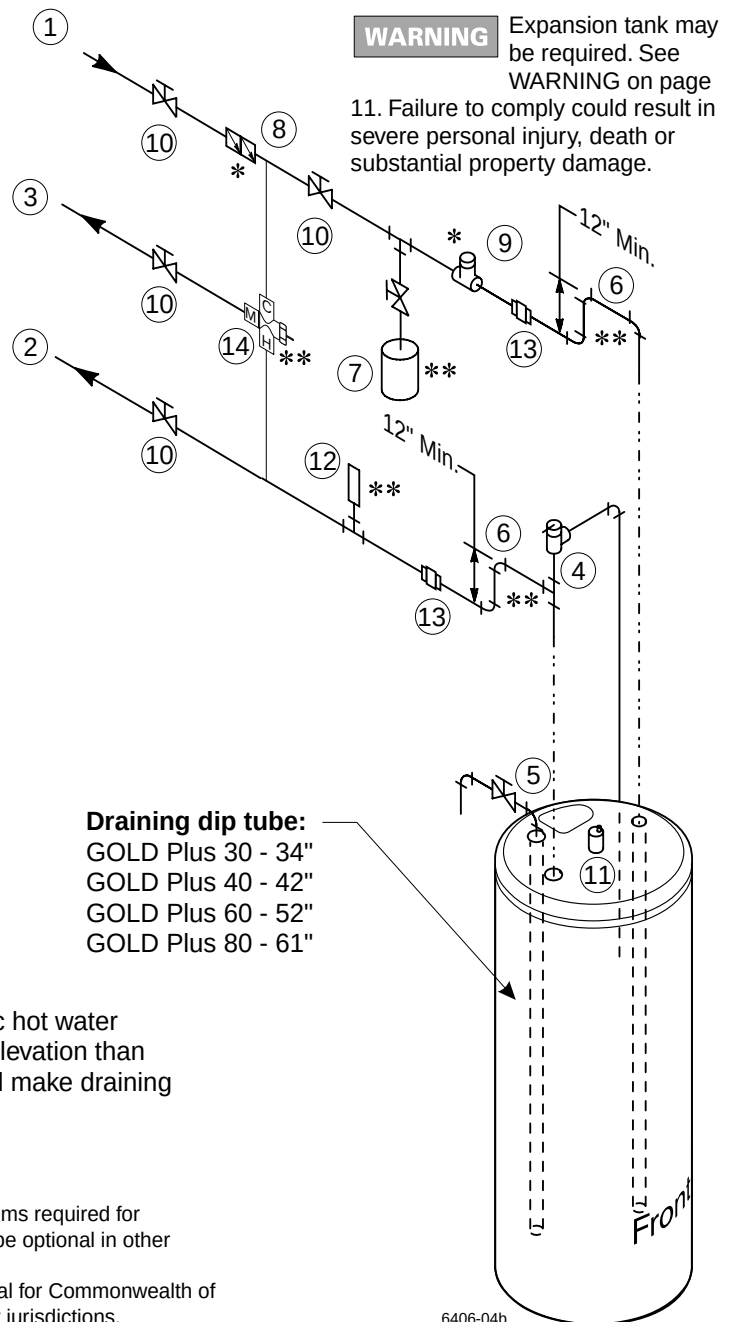
Figure 3

Piping — **Option 2**
GOLD Plus 30/40/60/80
(Required for Commonwealth
of Massachusetts)

- ① Cold water inlet
- ② Hot water outlet
- ③ Mixed water outlet
- ④ Brass tee and T & P relief valve (with long element)
- ⑤ Drain valve & brass ell
- ⑥ Heat trap loop (12" minimum) **
- ⑦ Expansion tank (see page 11) **
- ⑧ Backflow preventer *
- ⑨ Vacuum breaker *
- ⑩ Shutoff valve, 3/4" NPT
- ⑪ Automatic air vent
- ⑫ Shock arrester **
- ⑬ Union, 3/4" NPT - Union on domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining water heater easier.
- ⑭ Mixing valve **

* Items shown with an asterisk are additional items required for Commonwealth of Massachusetts. They may be optional in other jurisdictions.

** Items shown with a double asterisk are optional for Commonwealth of Massachusetts. They may be required in other jurisdictions.



Drain valve GOLD Plus 30/40/60/80 Option 2

Apply the following and Figure 3 to water heaters installed in Massachusetts. The drain valve is mounted in the AUX tapping on top of the water heater.

1. Insert an open-ended "draining" dip tube into the **AUX** tapping on top of the heater.
2. Connect a 3/4" NPT elbow to the **AUX** tapping, using suitable pipe dope or tape.
3. Pipe the drain valve (supplied with water heater) to the elbow, using suitable pipe dope or tape, as shown in Figure 3.
4. Pipe the T & P relief valve in the run of the 3/4" NPT brass tee (supplied with heater), located in the domestic water outlet piping as shown in Figure 3.

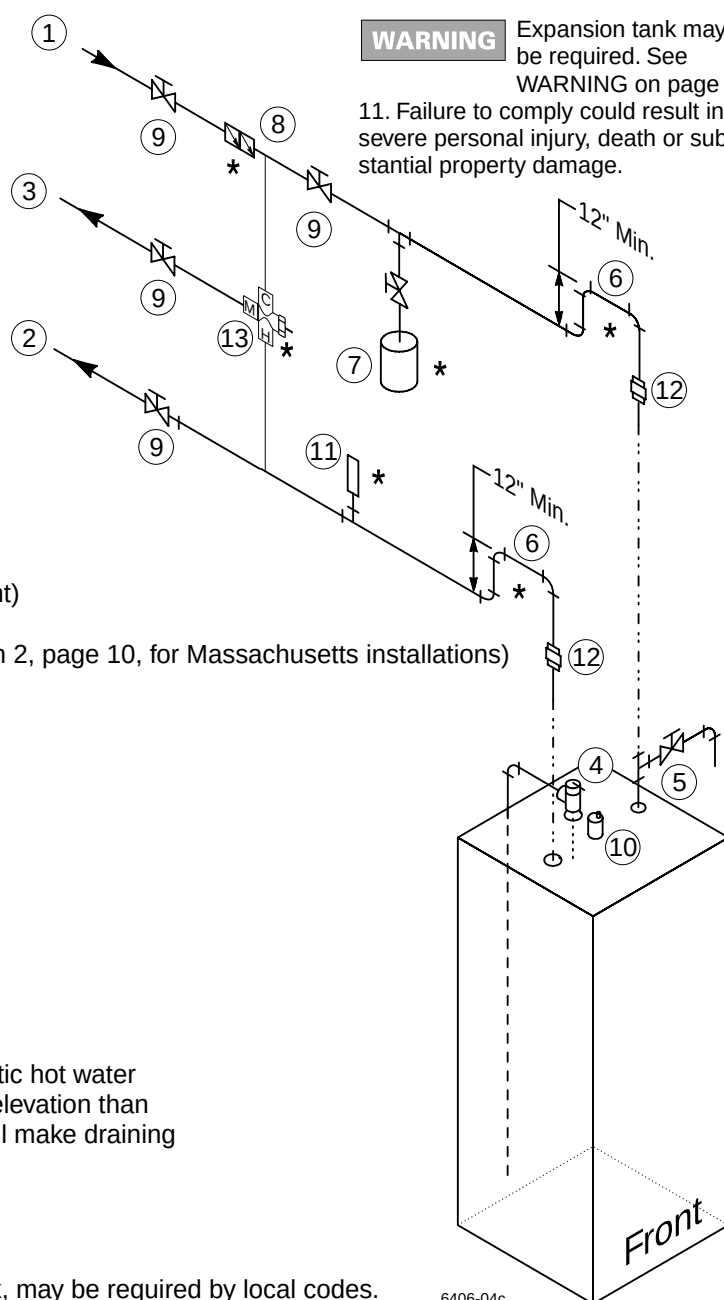


Figure 4

Piping — Option 1
PLUS 100/120
(See Figure 5, page 10, for
Option 2, required for
Massachusetts)

- ① Cold water inlet
- ② Hot water outlet
- ③ Mixed water outlet
- ④ T & P relief valve (with long element)
- ⑤ Drain valve & brass tee (see Option 2, page 10, for Massachusetts installations)
- ⑥ Heat trap loop (12" minimum) *
- ⑦ Expansion tank (see page 11) *
- ⑧ Backflow preventer *
- ⑨ Shutoff valve, 1½" NPT
- ⑩ Automatic air vent
- ⑪ Shock arrester *
- ⑫ Union, 1½" NPT - Union on domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining water heater easier.
- ⑬ Mixing valve *

* Optional items, shown with an asterisk, may be required by local codes.



Drain valve PLUS 100/120 Option 1

Apply the following and Figure 4 to water heaters other than those installed in Massachusetts. For Commonwealth of Massachusetts installations, see Option 2, Figure 5, page 10.

1. Install a brass tee in the domestic water inlet piping using suitable pipe dope or tape, located as shown in Figure 4.
2. Pipe the drain valve off of the brass tee as shown in Figure 4, using suitable pipe dope or tape.
3. For jurisdictions requiring a vacuum breaker, use the piping shown in Figure 5, page 10 (Option 2).
4. Obtain brass tee and drain valve from local supplier.

B Water heater piping continued

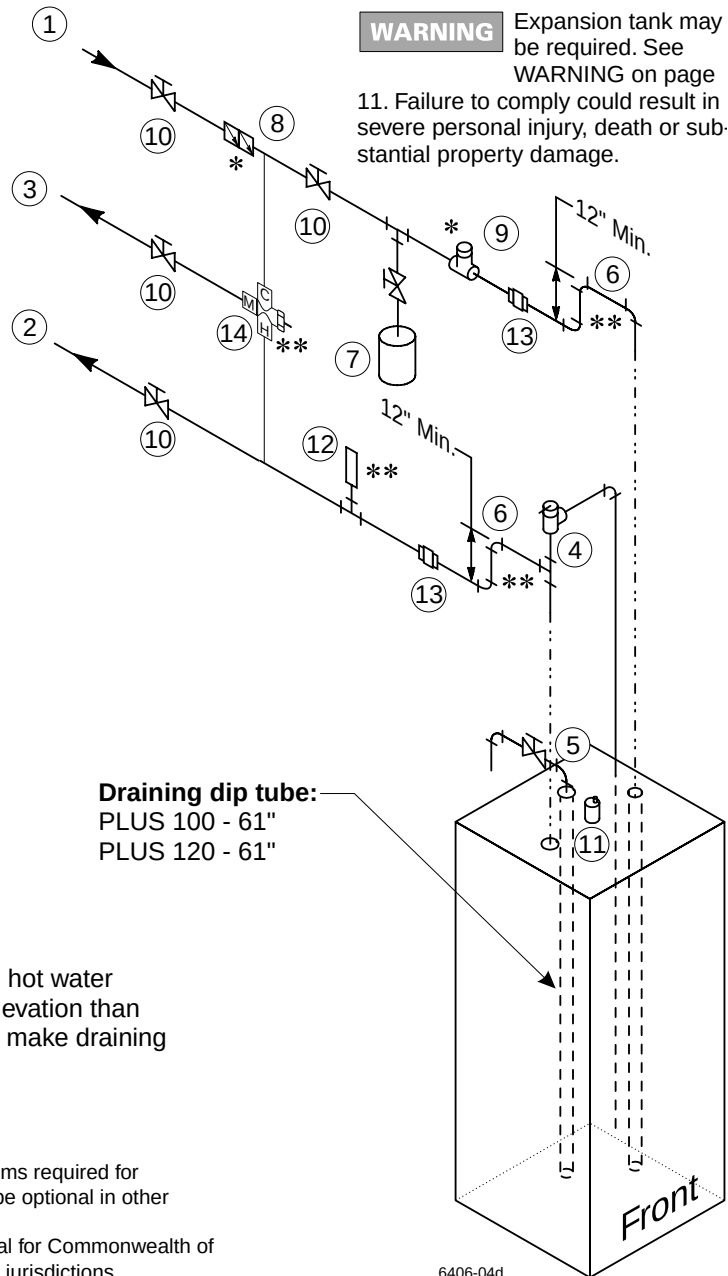
Figure 5

Piping — **Option 2**
PLUS 100/120
(Required for Commonwealth
of Massachusetts)

- ① Cold water inlet
- ② Hot water outlet
- ③ Mixed water outlet
- ④ Brass tee and T & P relief valve (with long element)
- ⑤ Drain valve & brass ell (with dip tube installed in tank)
- ⑥ Heat trap loop (12" minimum) **
- ⑦ Expansion tank (see page 11) *
- ⑧ Backflow preventer *
- ⑨ Vacuum breaker *
- ⑩ Shutoff valve, 3/4" NPT
- ⑪ Automatic air vent
- ⑫ Shock arrester **
- ⑬ Union, 3/4" NPT - Union on domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining water heater easier.
- ⑭ Mixing valve **

* Items shown with an asterisk are additional items required for Commonwealth of Massachusetts. They may be optional in other jurisdictions.

** Items shown with a double asterisk are optional for Commonwealth of Massachusetts. They may be required in other jurisdictions.



Drain valve PLUS 100/120 Option 2

Apply the following and Figure 5 to water heaters installed in Massachusetts. The drain valve is mounted in the AUX tapping on top of the water heater.

1. Insert an open-ended "draining" dip tube into the **AUX** tapping on top of the heater.
2. Connect an elbow to the **AUX** tapping, using suitable pipe dope or tape.
3. Pipe the drain valve to the elbow, using suitable pipe dope or tape, as shown in Figure 5.
4. Pipe the T & P relief valve in the run of the brass tee, located in the domestic water outlet piping as shown in Figure 5.
5. Obtain brass tee and drain valve from local supplier.



Thermal expansion

WARNING

If a backflow preventer, check valve, or pressure reducing valve is piped on cold water inlet of water heater, you must install an expansion tank on cold water supply line to prevent normal thermal expansion from repeatedly forcing open T&P relief valve. The T&P relief valve is not intended for constant duty, such as relief of pressure due to repeated normal system expansion.

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

Failure to follow the above could result in severe personal injury, death or substantial property damage.

Water hammer

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

General piping information

- For domestic water piping, see page 7 or 9.
- See **Section I: Piping Appendix**, pages 26-37, for:
 - Boiler water piping.
 - Multiple water heater piping.
 - Recirculation system piping.
- See Table 1 for piping connections:
 - All plumbing must meet or exceed all local, state and national plumbing codes.
 - Use pipe dope or tape suitable for potable water.
 - Use isolation valves to isolate system components.

Table 1
Piping (Inches NPT)

Water Heater Model	Connections		Recommended Piping Between Water Heater and Boiler	Recirculation Dip Tube	
	Domestic Water Inlet/Outlet	Boiler Water Supply/Return		Length (inches)	Diameter (inches)
30	¾	1	1	34	¾
40	¾	1	1	42	¾
60	¾	1 ¼	1 ¼	52	¾
80	¾	1 ¼	1 ½	61	¾
100	1 ½	2	1 ½	25	1 ½
120	1 ½	2	2	32	1 ½

See Piping Appendix, pages 26-37, for recirculation system piping.



B

Water heater piping continued

Domestic water piping

- Union on domestic hot water outlet should be piped at a higher elevation than domestic water drain valve. This will make draining water heater easier.
- Install unions for easy removal of water heater. 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 contains an internal plastic dip tube rated at 230°F, which can be damaged by heat from soldering.
- When water supply pressure is higher than T&P relief valve rating, install a pressure reducing valve on cold water supply line to prevent water loss through T&P relief valve.
- If water heater will replace tankless coil in boiler, disconnect piping to coil or remove coil from boiler and replace with a cover plate. Allow water to drain from coil. Do not plug tankless coil.

DANGER

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

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

DANGER

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



C Wiring

Water heater thermostat connection

The GOLD Plus and PLUS indirect water heaters utilize a snap-set connector for easy wiring between water heater thermostat and boiler controls (also see **Section J: Wiring Appendix** pages 38-51). See Figure 6a and Figure 6b, below.

Figure 6a

GOLD Plus 30/40/60/80 thermostat connection

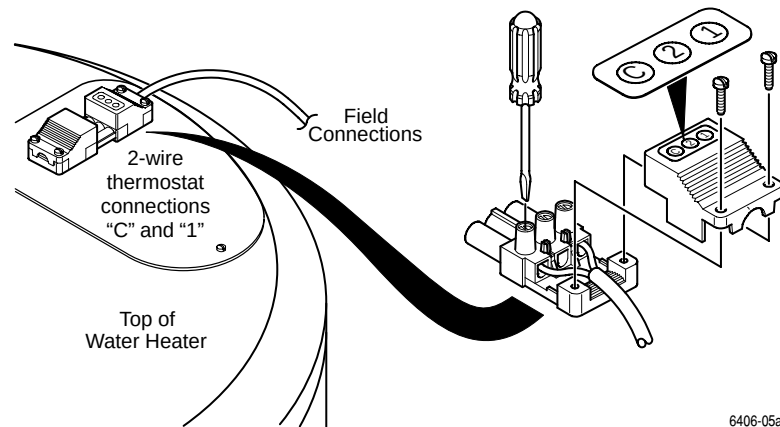
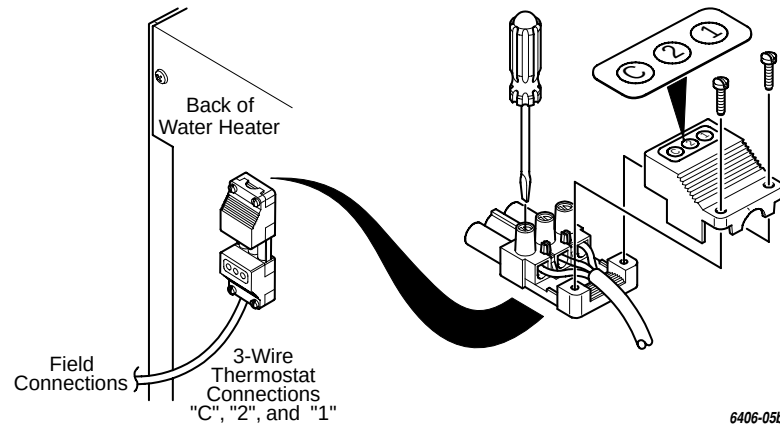


Figure 6b

Commercial PLUS 100/120 thermostat connection





D

Water heater start-up

Filling the inner (domestic water) tank

CAUTION

- Never use water heater unless inner and outer tanks are completely filled with water.
- Inner tank must be completely filled and pressurized before pressurizing outer tank.

1. Close domestic water drain valve.
2. Open domestic water isolation valves for water heater.
3. Vent air from inner (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.

Filling the outer (boiler water) tank

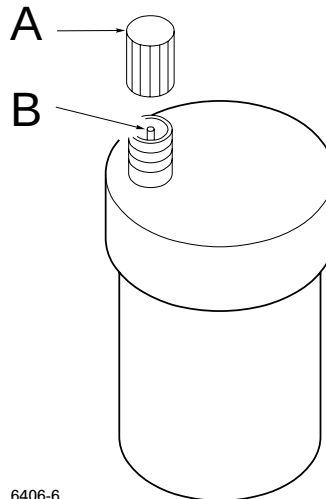
CAUTION

- Never use water heater unless inner and outer tanks are completely filled with water.
- Inner tank must be completely filled and pressurized before pressurizing outer tank.

1. Close boiler water drain valve at boiler water outlet of water heater.
2. Open water heater's boiler water isolation valves.
3. Allow air to escape from outer (boiler water) tank by opening cap "A" (see Figure 7) on automatic air vent, located on top of water heater.

Figure 7

Open cap on air vent to allow air to escape from outer tank



6406-6

NOTICE

For proper operation of the water heater, always leave vent cap unscrewed one full turn.

4. Follow instructions furnished with boiler to fill with water.
5. When tank is full, air will stop escaping, and air vent will close. If air vent does not seat properly (i.e., water leaks out), remove cap "A". Briefly push in valve "B" (see above) and release it to clean valve seat. Screw cap "A" on completely, then unscrew one turn.
6. If antifreeze is used in boiler water, check concentration. Boiler water (including additives) must be practically non-toxic, having a toxicity rating or class of 1, as listed in Clinical Toxicology of Commercial Products. Inhibited propylene glycol is recommended. Follow antifreeze manufacturer's instructions.

WARNING

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



Start-up checklist

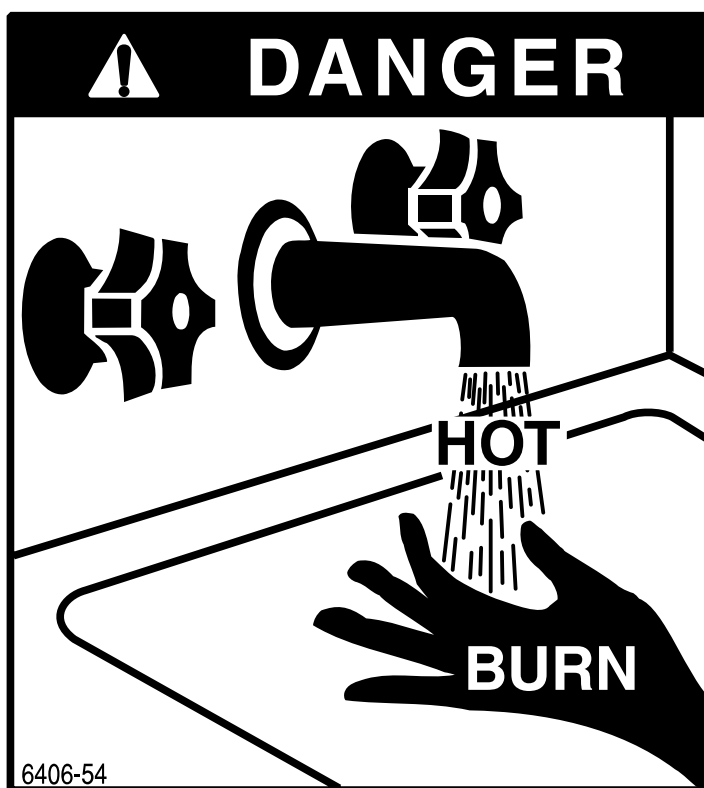
- ☐ Long element T&P relief valve is properly installed and drain discharge is directed away from all persons.
- ☐ Both inner and outer tanks are filled with water.
- ☐ All air has been bled from both domestic and boiler water systems.
- ☐ Automatic air vent is installed and cap is unscrewed one full turn.
- ☐ Cold and hot water lines are correctly connected to domestic water system.
- ☐ Supply and return piping from boiler is correctly connected to water heater.
- ☐ All wiring is installed correctly.
- ☐ Thermostat on water heater is set according to system requirements. See pages 16 - 17.
- ☐ Boiler and water heater are operating properly.
- ☐ Fittings and piping have been checked for leaks.
- ☐ Installer has reviewed the following sections with system maintainer:
 - General Safety
 - Water Heater Start-Up
 - Adjusting Water Heater Temperature
 - Water Heater Maintenance

E

Adjusting water heater temperature

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 temperature settings of 130°F or less. Setting thermostat higher than 130°F setting will increase risk of scald injury and can 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, shower or sink. Never allow small children to use a hot water faucet or draw their own bath. 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 recommendations and instructions.
 - Use the lowest practical temperature setting.
 - Check water temperature after any adjustment. You must follow "Setting the Thermostat" on page 17.

**General notes**

- 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.
- When hot water is used in repeated small quantities, a "stacking" effect can develop in hot water tank. The upper layer of water in tank can be much hotter than lower layers.
- Lowering the thermostat setting or installing automatic mixing valves as indicated in these instructions will reduce water temperature levels. Consult your installer or service technician.



Setting the thermostat GOLD Plus 30/40/60/80



6406-53

WARNING

Studies have indicated that dangerous bacteria, including legionella pneumophila, can form in the potable water distribution system if certain minimum water temperatures are not maintained. Contact your local health department for more information.

Water heater thermostat is factory set to its lowest temperature. The Indicator () on label is a preferred starting point for setting 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 reduce** water temperature.

When decreasing temperature setting, the stored hot water must be used before checking temperature at faucet.

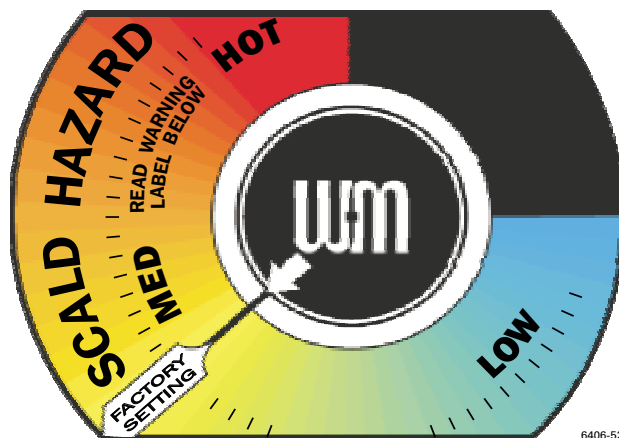
Check water temperature at a hot water faucet immediately after first heating cycle. Further temperature adjustment may be necessary as water heating system is used. Recheck water temperature at faucet after adjustment.

When adjusting thermostat, be sure boiler limit control is set a minimum 20°F higher.

WARNING

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

Setting the thermostat PLUS 100/120



6406-52

WARNING

Studies have indicated that dangerous bacteria, including legionella pneumophila, can form in the potable water distribution system if certain minimum water temperatures are not maintained. Contact your local health department for more information.

Water heater thermostat is factory set to its lowest temperature. The Factory Setting mark on label is the preferred starting point for setting 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 reduce** water temperature.

When decreasing temperature setting, the stored hot water must be used before checking temperature at faucet.

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 20°F higher.

WARNING

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

F

Water heater maintenance

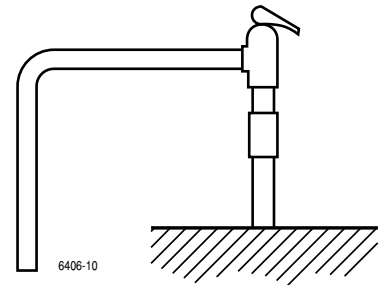
Maintenance schedule – annual service technician

Annual service by qualified service technician to include:

- Any procedures required by local codes.
- Check air vent operation.
- Verify system pressure. Air venting procedure may require adding water to bring system up to pressure, typically 12 psig.
- Manually operate T&P relief valve at least once a year. This will release some hot water.

WARNING

Before operating T&P relief valve, make sure no one is in front of or around T&P relief valve discharge piping. Hot discharge water can cause severe personal injury or substantial property damage.



- Move operating lever to open position for a few seconds and then move it back, allowing it to snap closed. After T&P relief valve is operated, if it continues to release water, close cold water inlet to water heater immediately. Follow draining instructions, and replace T&P relief valve. If T&P relief valve weeps periodically, it may be due to thermal expansion (see “Thermal Expansion”, page 11). Do not plug T&P relief valve or discharge piping.

WARNING

Plugging T&P relief valve or discharge piping can cause excessive pressure in water heater, resulting in severe personal injury, death or substantial property damage.

- Follow instructions on circulator to oil it, if oil-lubricated.
- Check valves, pipes and fittings for leaks.
- Check function of field-installed controls and valves (see control manufacturer’s instructions).
- Review homeowner’s maintenance responsibilities and their frequencies, including any not listed in the following paragraphs.

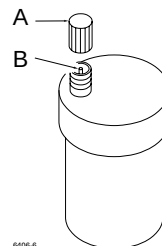
Maintenance schedule – monthly homeowner

Homeowner monthly maintenance to include:

- Check air vent operation:
 - Automatic air vent — remove cap (see Figure 8). Briefly push in valve and release it to clean valve seat. Screw cap on completely, then unscrew one turn. If air vent does not operate, call qualified service technician.

Figure 8

Remove air vent cap to check operation



- Visually check valves, pipes and fittings for leaks. Call qualified service technician to repair leaks.



Filling

See **Filling the Inner (Domestic Water) Tank**, and **Filling the Outer (Boiler Water) Tank**, on page 14.

Draining

Drain water heater if it will be shut off and exposed to freezing temperatures. Freezing water will expand and may damage water heater.

If boiler water contains sufficient antifreeze, then only the domestic water needs to be drained.

If boiler water does not contain sufficient antifreeze, then the boiler water and the domestic water must be drained.

CAUTION

Close boiler water isolation valves and relieve pressure to below 15 psi in outer tank before draining inner tank to prevent damage to inner tank.

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***. Inhibited propylene glycol is recommended. Follow antifreeze manufacturer's instructions.

WARNING

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

WARNING

Water from opened drain valves, unions and other connections may be extremely hot. To avoid severe personal injury, death or substantial property damage:

- Tighten all drain hose connections.
- Direct hot water away from all persons.

Draining inner (domestic water) tank

See piping drawings, pages 7-10.

1. Disconnect power supply to water heater.
 - If outer (boiler water) tank pressure is greater than 15 psig, relieve boiler pressure and close isolation valves before proceeding.
2. Close system supply isolation valve.
3. Remove cap and connect a hose to domestic water drain valve. Hose should extend to drain at floor level to allow siphoning of domestic water tank.
4. Open union on domestic water outlet or hot water faucet at highest point above heater.
5. Open domestic water drain valve to start siphoning.
6. When draining is complete, close union or hot water faucet and domestic water drain valve.

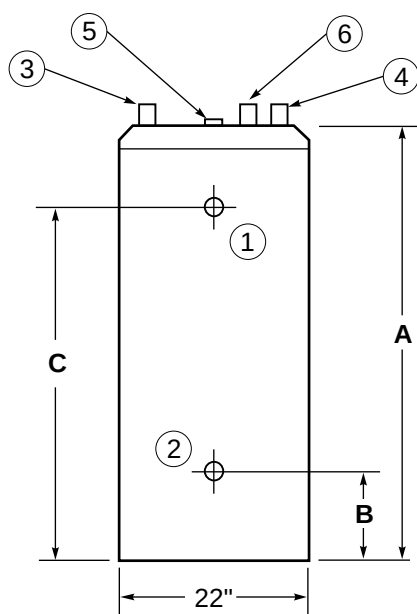
Draining outer (boiler water) tank

See piping drawings, pages 7-10.

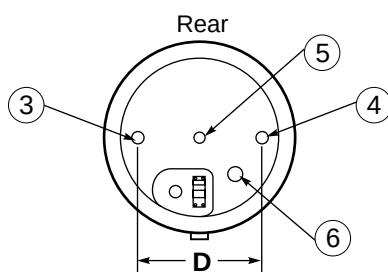
1. Disconnect power supply to water heater.
2. Close boiler water isolation valves between water heater and boiler.
3. Connect hose to boiler water drain valve at water heater. Open and drain water to a safe place.
4. To speed draining, loosen air vent on top of tank.
5. When draining is complete, close drain valve and retighten air vent.

G Water heater dimensions & specifications

GOLD Plus 30/40/60/80



Rear View



Top View

- ① Boiler water return
- ② Boiler water supply
- ③ Domestic water inlet
- ④ Domestic water outlet
- ⑤ Air vent
- ⑥ AUX - For long element T&P relief valve or drain valve, and for use as a return connection if circulated domestic water is required - see piping drawings, pages 7 - 8

6406-12

Water Heater Model	Capacity (gallons)		Heating Surface (ft ²)	Head Loss (feet)	Dimensions (inches)						Approximate Shipping Weight (lb.)
	Domestic	Boiler		Boiler Side	Domestic Inlet/Outlet & AUX	Boiler Water Supply & Return	A	B	C	D	
GOLD Plus 30	28	5	13	¾	¾	1	38	9	30	14 ¼	135
GOLD Plus 40	36	6	16	1	¾	1	46	9	38	14 ¼	155
GOLD Plus 60	46	8	20	1 ¼	¾	1 ¼	57	9	49	14 ¼	180
GOLD Plus 80	56	8	24	1 ½	¾	1 ¼	66	9	58	14 ¼	200

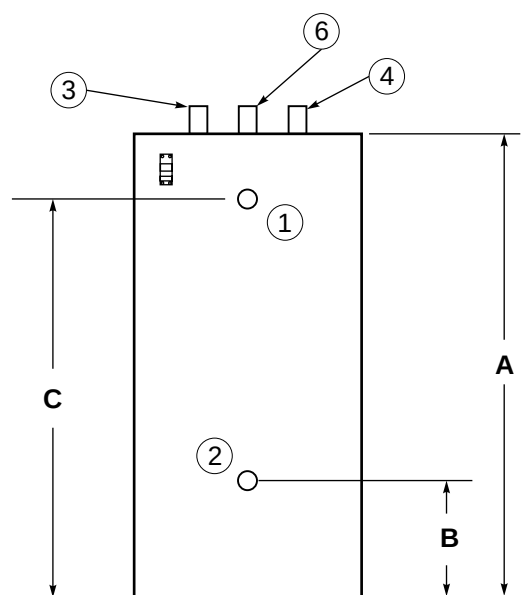
First hour ratings are based on the following conditions:

- 50 °F Domestic inlet water temperature.
- 200 °F Boiler water supply temperature.
- Assumes approximately 80% usable storage.
- Boiler side flow rates should be:
 GOLD Plus 30 – 8 GPM
 GOLD Plus 40 – 9 GPM
 GOLD Plus 60 – 13 GPM
 GOLD Plus 80 – 20 GPM

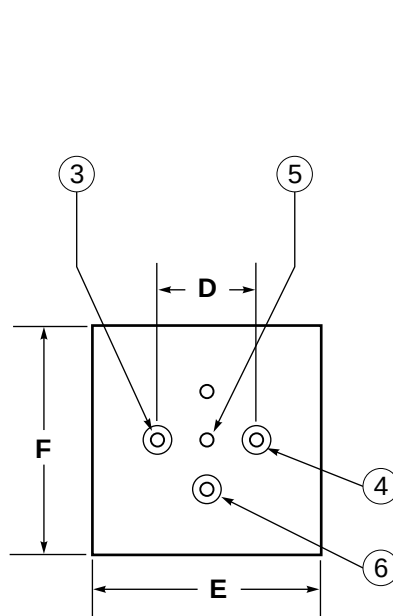
Boiler DOE Heating Capacity MBH	First Hour Rating Capacity (GPH) for the GOLD Plus Line							
	GOLD Plus 30		GOLD Plus 40		GOLD Plus 60		GOLD Plus 80	
	115 °F	140 °F	115 °F	140 °F	115 °F	140 °F	115 °F	140 °F
50	120	90	125	95	135	100	145	115
70	155	115	160	120	170	130	180	140
90	190	140	200	150	210	160	220	170
110	230	140	235	170	245	185	255	195
130	230	140	260	170	280	210	290	220
150	230	140	260	170	320	220	330	250
170	230	140	260	170	355	220	365	275
190	230	140	260	170	365	220	400	300
210	230	140	260	170	365	220	440	350
250	230	140	260	170	365	220	510	380
300	230	140	260	170	365	220	600	410
350	230	140	260	170	365	220	670	410
400	230	140	260	170	365	220	670	410



Commercial PLUS 100/120



Rear View



Top View

- ① Boiler water supply
- ② Boiler water return
- ③ Domestic water inlet
- ④ Domestic water outlet
- ⑤ Air vent
- ⑥ AUX - For long element T&P relief valve or drain valve, and for use as a return connection if circulated domestic water is required - see piping drawings, pages 9-10

6406-13

Water Heater Model	Capacity (gallons)		Heating Surface (ft ²)	Head Loss (feet)	Dimensions (inches)								Approximate Shipping Weight (lb.)
	Domestic	Boiler			Boiler Side	Domestic Inlet/Outlet & AUX	Boiler Water Supply & Return	A	B	C	D	E	
PLUS 100	76	8	28	2	1 ½	2	62	12 ¼	53	10 ¾	26 ¾	25 ¾	360
PLUS 120	120	30	42	2 ½	1 ½	2	73 ¼	11 ¾	64	10 ¾	32 ¼	31 ¼	450

Boiler DOE Heating Capacity MBH	First Hour Rating Capacity (GPH) for the Commercial PLUS Line			
	PLUS 100		PLUS 120	
	115 °F	140 °F	115 °F	140 °F
50	160	130	210	170
70	200	150	250	185
90	230	180	285	215
110	270	210	320	245
130	310	230	360	265
150	345	260	400	300
170	380	290	430	325
190	420	310	470	345
210	455	340	510	375
250	530	395	590	430
300	620	460	675	500
350	715	510	765	560
400	740	510	860	630
450	740	510	960	650
500	740	510	970	650

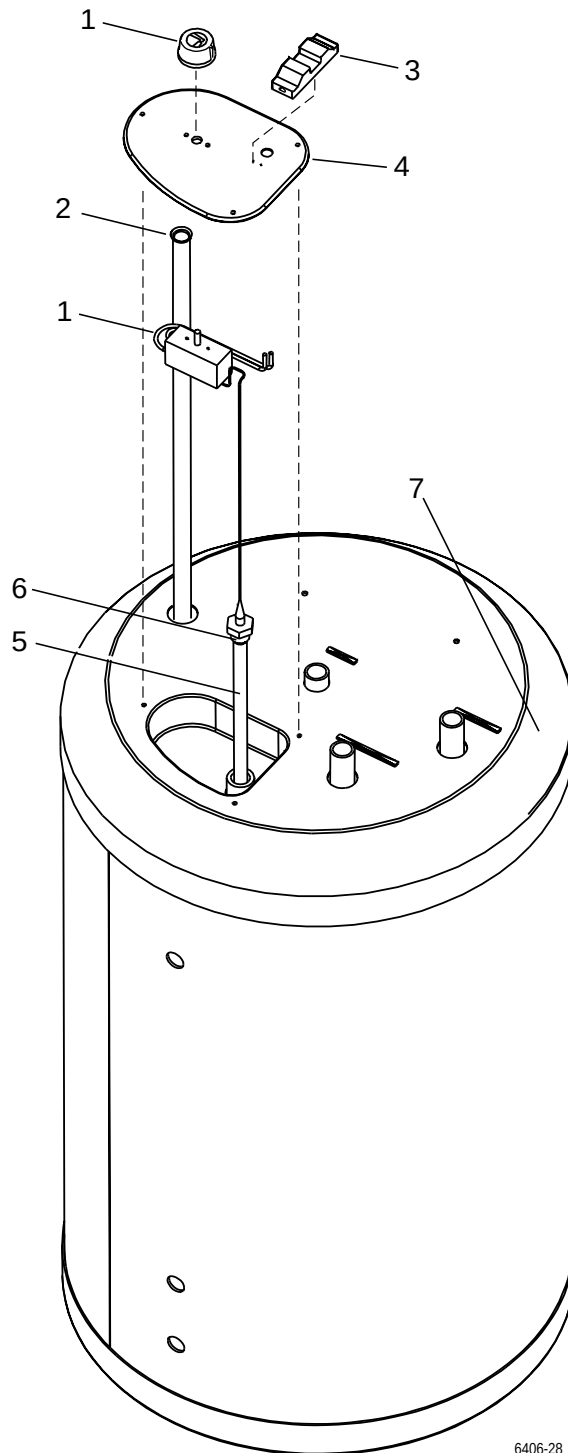
First hour ratings are based on the following conditions:

- 50 °F Domestic inlet water temperature.
- 200 °F Boiler water supply temperature.
- Assumes approximately 80% usable storage.
- Boiler side flow rates should be:
PLUS 100 – 22 GPM
PLUS 120 – 28 GPM

H

Replacement parts

GOLD Plus
30/40/60/80



6406-28

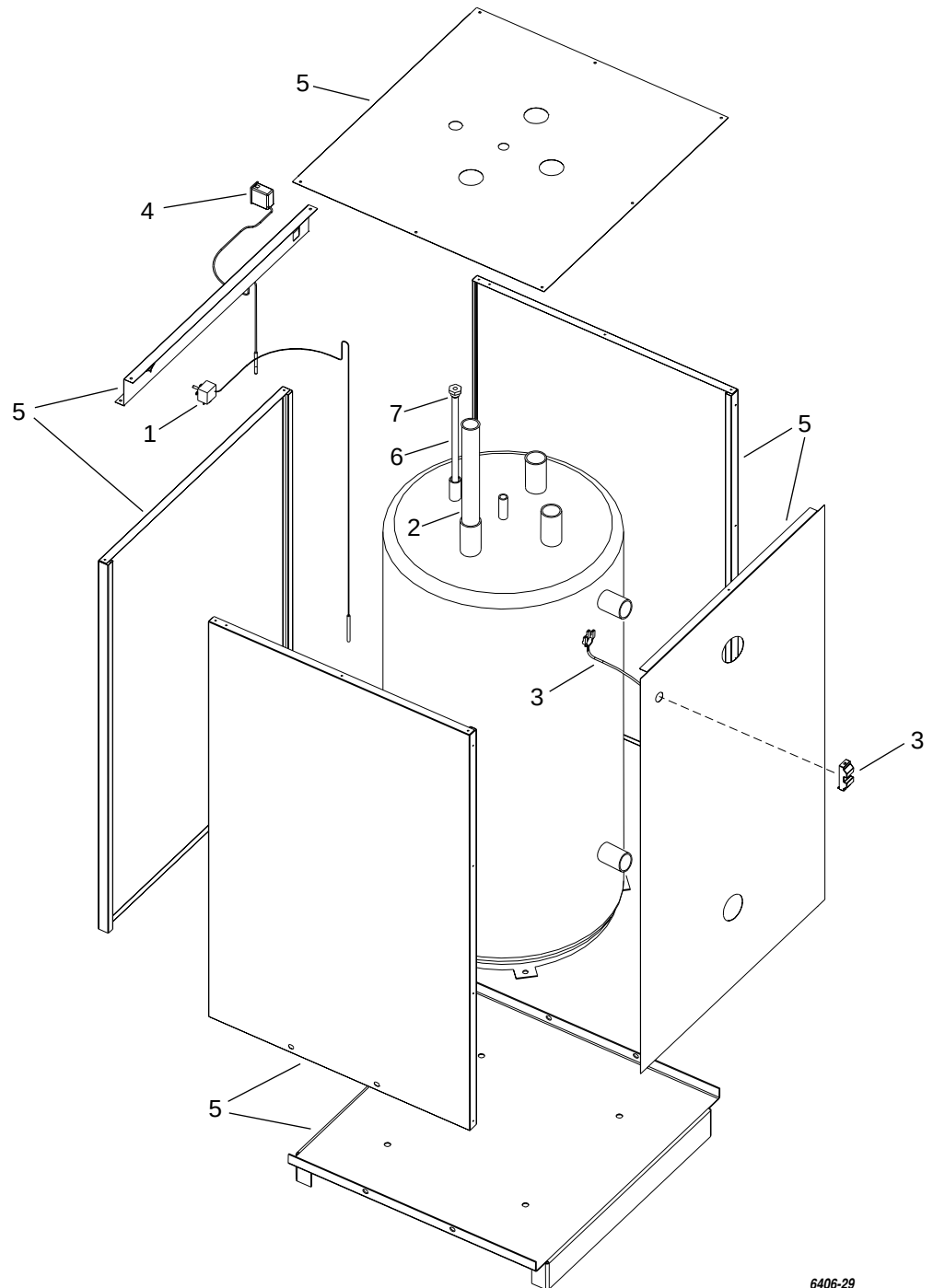


Item	Description	Size	Manufacturer	Weil-McLain Part Number
1	Thermostat Kit with Knob - No Cover Plate		Weil-McLain	633-900-130
not shown	Air Vent, Automatic, # 400	1/8"	Taco	635-100-003
not shown	Drain Valve Kit		Weil-McLain	633-900-117
2	GOLD Plus 30 Dip Tube Kit	3/4"	Weil-McLain	633-900-118
	GOLD Plus 40 Dip Tube Kit	3/4"	Weil-McLain	633-900-119
	GOLD Plus 60 Dip Tube Kit	3/4"	Weil-McLain	633-900-120
	GOLD Plus 80 Dip Tube Kit	3/4"	Weil-McLain	633-900-125
not shown	"O" Rings, 2 each	3/4"	Weil-McLain	635-600-096
3	Snap-Set with Wire Connector		Weil-McLain	635-600-145
4	Cover Plate and Plastic Fasteners		Weil-McLain	633-900-200
5	GOLD Plus 30 Drywell and "O" Ring		Weil-McLain	635-600-061
	GOLD Plus 40 Drywell and "O" Ring		Weil-McLain	635-600-062
	GOLD Plus 50 Drywell and "O" Ring		Weil-McLain	635-600-063
	GOLD Plus 60 Drywell and "O" Ring		Weil-McLain	635-600-064
6	Drywell "O" Ring		Weil-McLain	635-600-150
not shown	Thermostat with Cover Plate Kit		Weil-McLain	633-900-102
7	Plastic Top Cover (specific to tank size)		Weil-McLain	Special Order

H

Replacement parts continued

**Commercial PLUS
100/120**





Item	Description	Size	Manufacturer	Weil-McLain Part Number
1	Thermostat Kit		Weil-McLain	635-100-010
not shown	Air Vent, Automatic, # 400	1/8"	Taco	635-100-003
2	Plastic Dip Tube Kit	1 1/2"	Weil-McLain	633-900-115
not shown	"O" Rings, 2 each	1 1/2"	Weil-McLain	635-600-098
3	Snap-Set with Wire Connector		Weil-McLain	635-600-080
4	Thermometer		Weil-McLain	635-600-084
5	PLUS 100 Jacket Replacement, Steel, Blue, Ser. 2		Weil-McLain	634-100-390
	PLUS 120 Jacket Replacement, Steel, Blue, Ser. 2		Weil-McLain	634-100-395
6	PLUS 100 Drywell and "O" Ring		Weil-McLain	635-600-065
	PLUS 100 Drywell and "O" Ring		Weil-McLain	635-600-066
7	Drywell "O" Ring		Weil-McLain	635-600-150

I Piping appendix

Figure 9

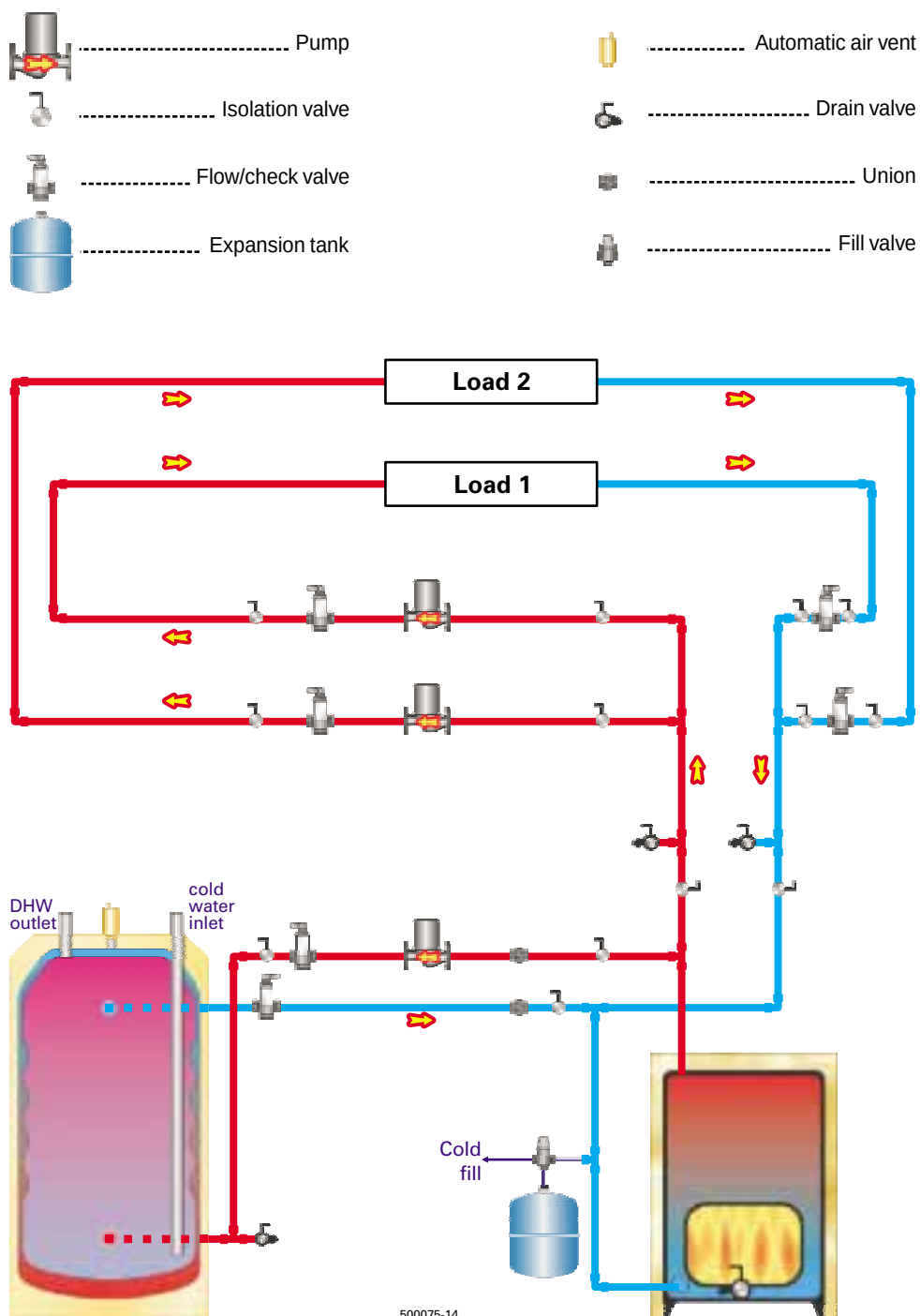
GOLD Plus 30/40/60/80

• Zoning with pumps

- Place pumps at beginnings of zones. Placing them at the ends of zones could result in heating idle zones.
- Size manifold piping for total flow of all zone pumps.
- Locate flow/check valves as close as possible to water heater boiler side connections — to reduce heat loss between cycles.
- Pipe GV boilers only as shown on page 28.

Wiring options:

- Figure 21, page 39 — Priority zone pump
- Figure 24, page 42 — Pump relays with domestic priority
- Figure 25, page 43 — Pump relays without domestic priority



Notes

1. This drawing is conceptual only. It shows representative piping components and layout. Weil-McLain does not represent that this drawing meets any particular mechanical or building codes. The installer is responsible for inclusion of all required safety devices, or other miscellaneous piping hardware not shown on drawing. The installer is responsible for proper sizing/selection of all hardware shown on this diagram.
2. See Weil-McLain installation instructions for specific details on installing the boiler.

Figure 10

GOLD Plus 30/40/60/80

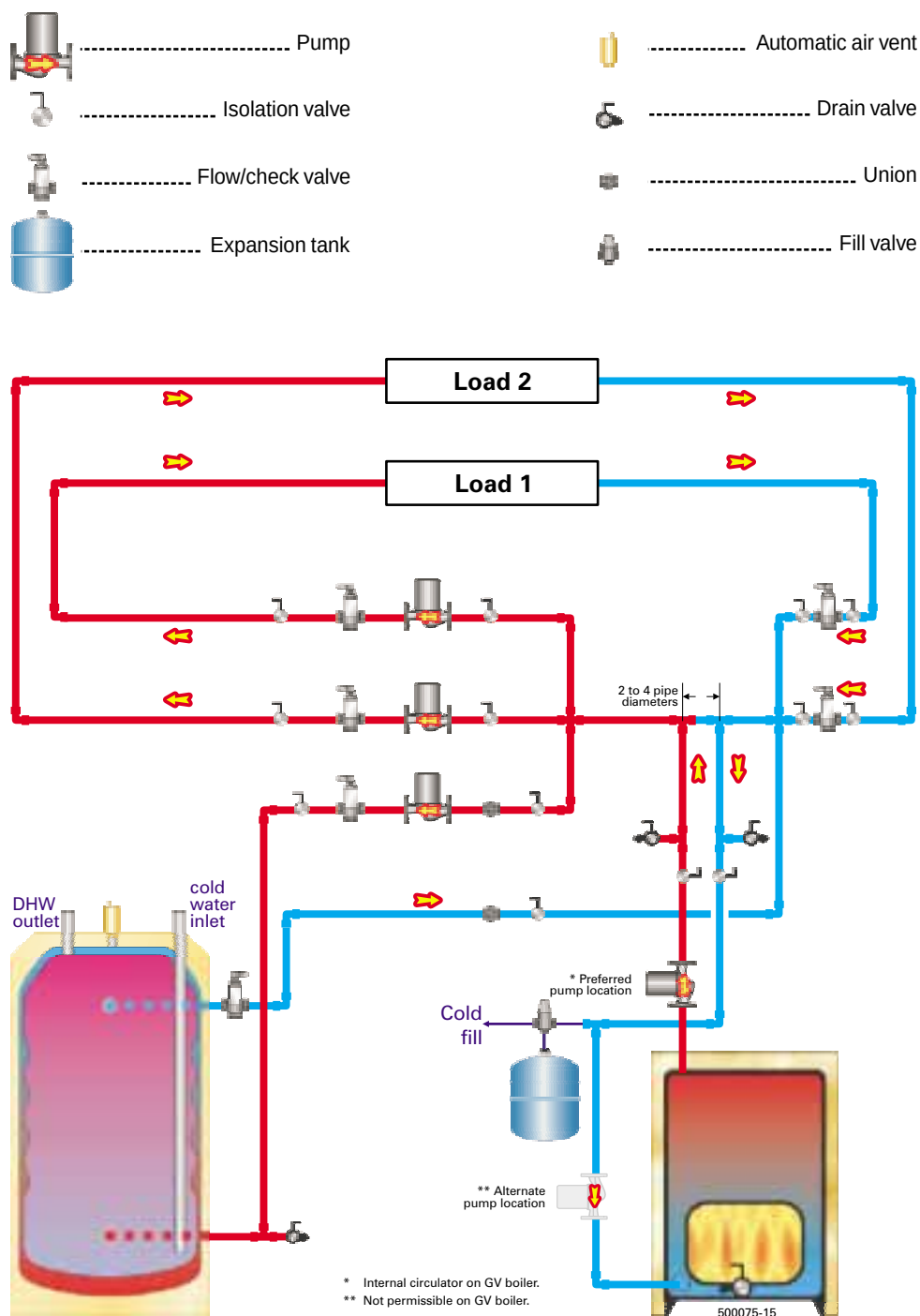
• **Zoning with pumps**

• Primary/secondary piping

- Place pumps at beginnings of zones. Placing them at the ends of zones could result in heating idle zones.
- Size primary circuit manifold for total flow of all zone pumps, with pressure drop of no more than 1 foot W.C.
- Locate flow/check valves as close as possible to water heater boiler side connections — to reduce heat loss between cycles.

Wiring options:

- Figure 21, page 39 — Priority zone pump
- Figure 24, page 42 — Pump relays with domestic priority
- Figure 25, page 43 — Pump relays without domestic priority



Notes

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2. See Weil-McLain installation instructions for specific details on installing the boiler.

I

Piping appendix continued

Figure 11

GOLD Plus 30/40/60/80

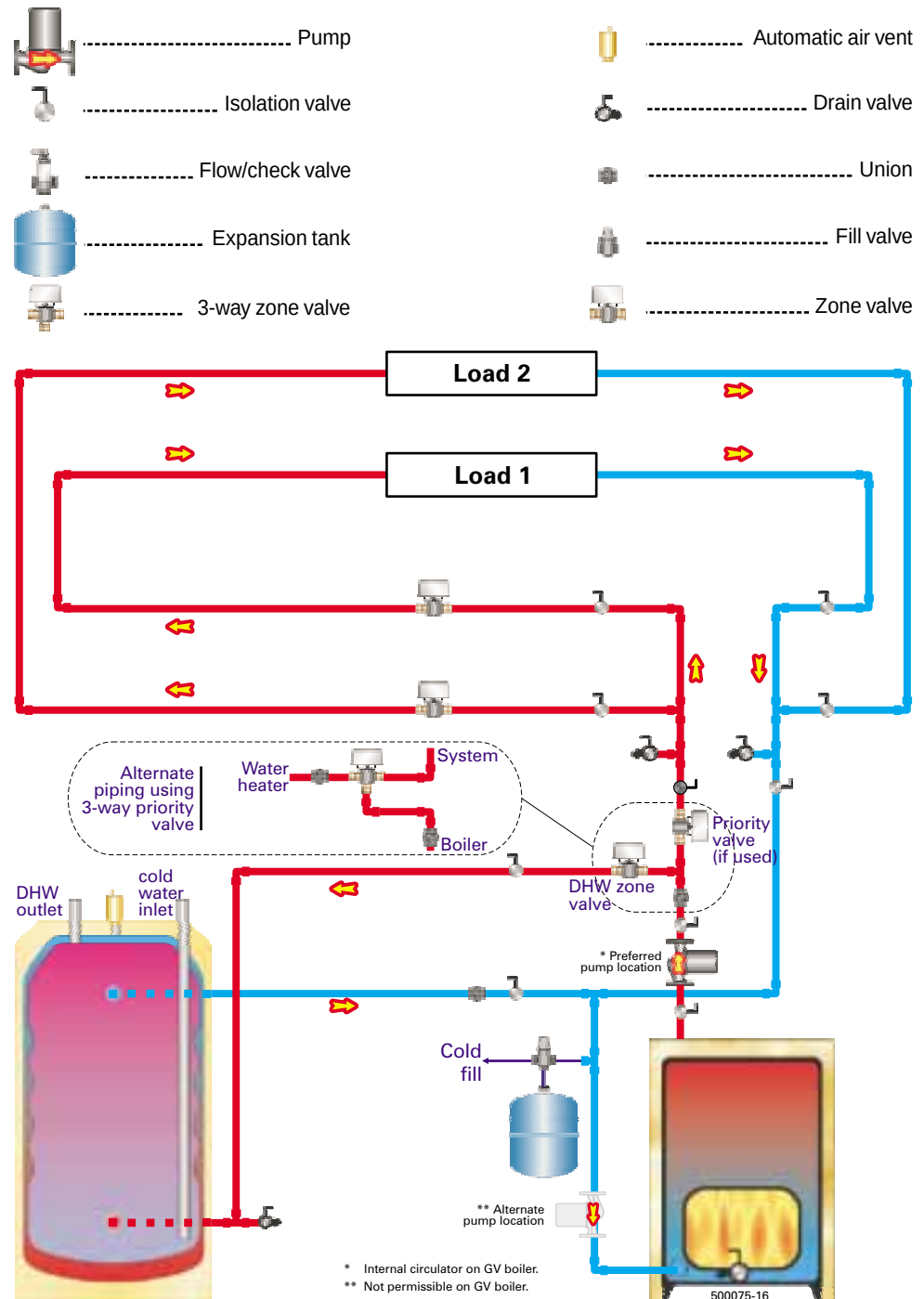
Commercial PLUS 100/120
(pipe boiler side supply to top heater connection, return to bottom connection)

• Zoning with zone valves

- Place pumps at beginnings of zones. Placing them at the ends of zones could result in heating idle zones.
- Size manifold piping for total flow of all zone pumps.
- For Commercial PLUS 100/120 in residential applications — Pipe boiler supply and return same as GOLD Plus 30/40/60/80 (supply at bottom, return at top) to minimize stacking potential.

Wiring options:

- Figure 31, page 49 or Figure 32, page 50 — Priority using 2-way valve
- Figure 28, page 46 or Figure 29, page 47 — Priority with 2-way priority valve and 2-way zone valve on water heater circuit
- Figure 26, page 44 or Figure 27, page 45 — No priority, using 2-way zone valve on water heater circuit



Notes

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2. See Weil-McLain installation instructions for specific details on installing the boiler.



Figure 12

GOLD Plus 30/40/60/80

Commercial PLUS 100/120
(pipe boiler side supply to top heater connection, return to bottom connection)

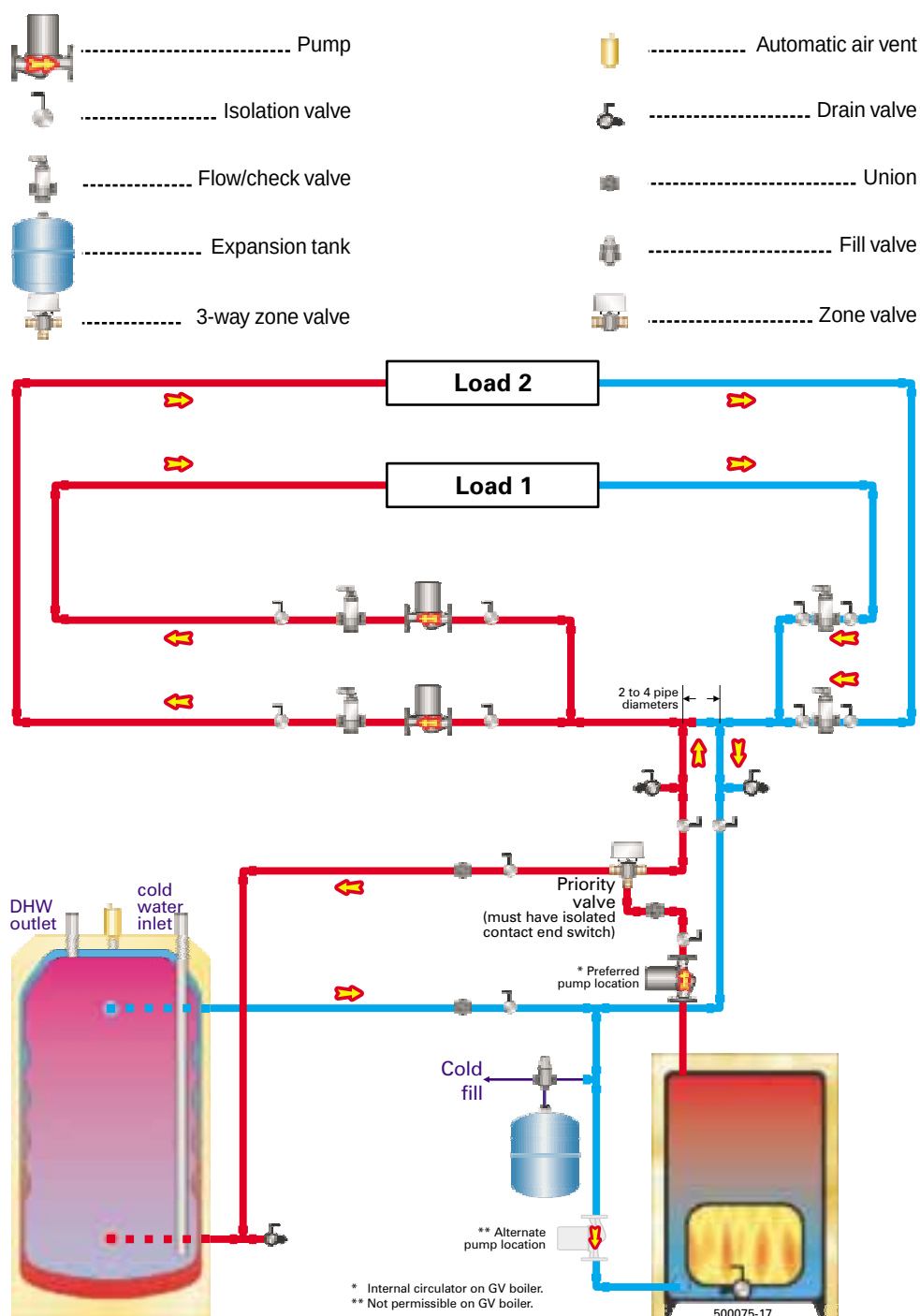
• **Zoning with pumps**

- Primary/secondary piping

- Place pumps at beginnings of zones. Placing them at the ends of zones could result in heating idle zones.
- Size primary circuit manifold for total flow of all zone pumps, with pressure drop of no more than 1 foot W.C.
- For Commercial PLUS 100/120 in residential applications — Pipe boiler supply and return same as GOLD Plus 30/40/60/80 (supply at bottom, return at top) to minimize stacking potential.

Wiring options:

- Figure 33, page 51 — Pump relays and 3-way priority valve and priority relay



Notes

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2. See Weil-McLain installation instructions for specific details on installing the boiler.

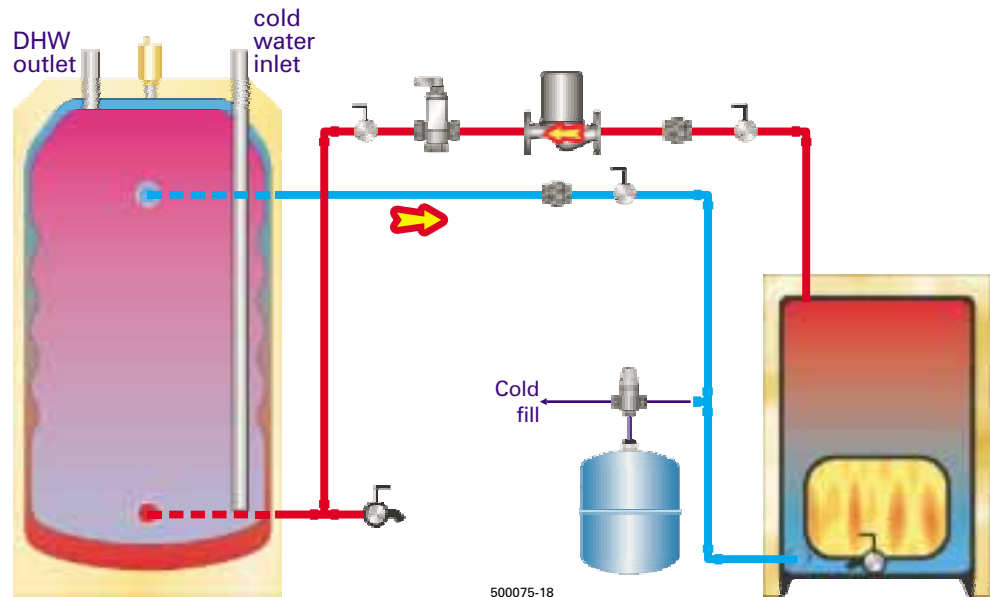
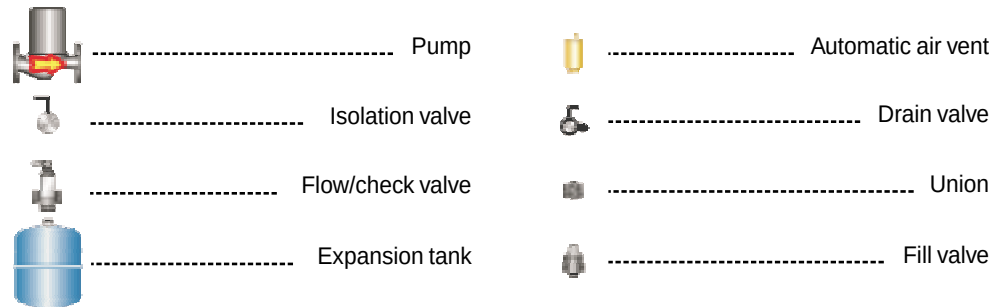
I

Piping appendix continued

Figure 13

Dedicated single boiler with single water heater in residential application (typically GOLD Plus 30/40/60/80).

- Locate flow/check valve as close as possible to water heater boiler side connections — to reduce heat loss between cycles.



Notes

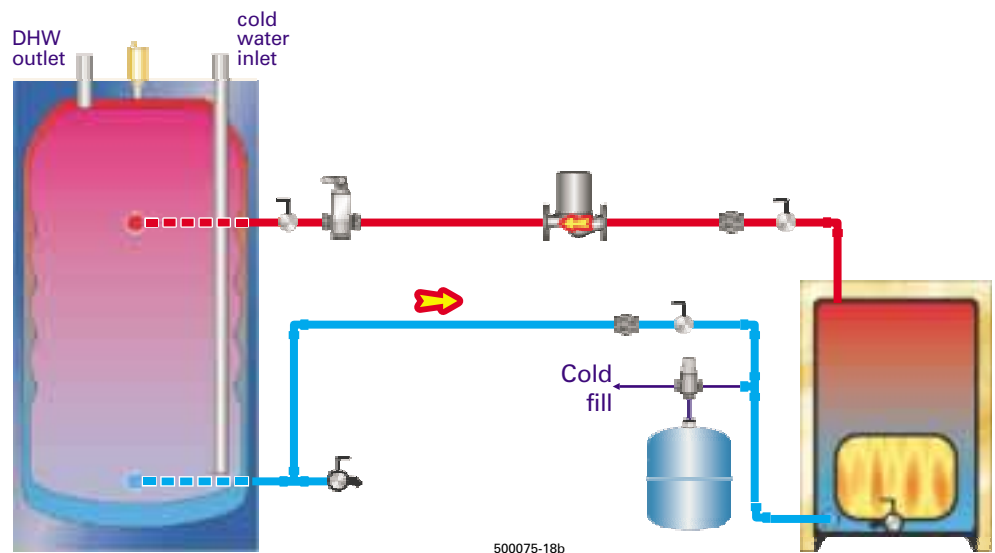
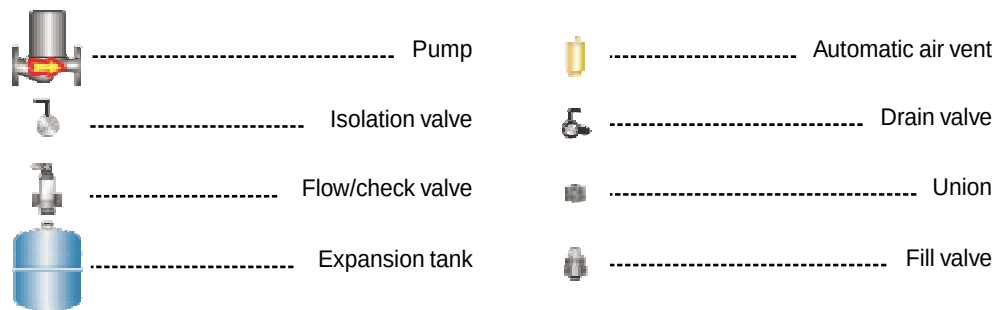
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2. See Weil-McLain installation instructions for specific details on installing the boiler.
3. Recommended piping for PLUS 100/120 water heaters used in residential applications.



Figure 14

Dedicated single boiler with single water heater in commercial application (typically PLUS 100/120).

- Locate flow/check valve as close as possible to water heater boiler side connections — to reduce heat loss between cycles.



Notes

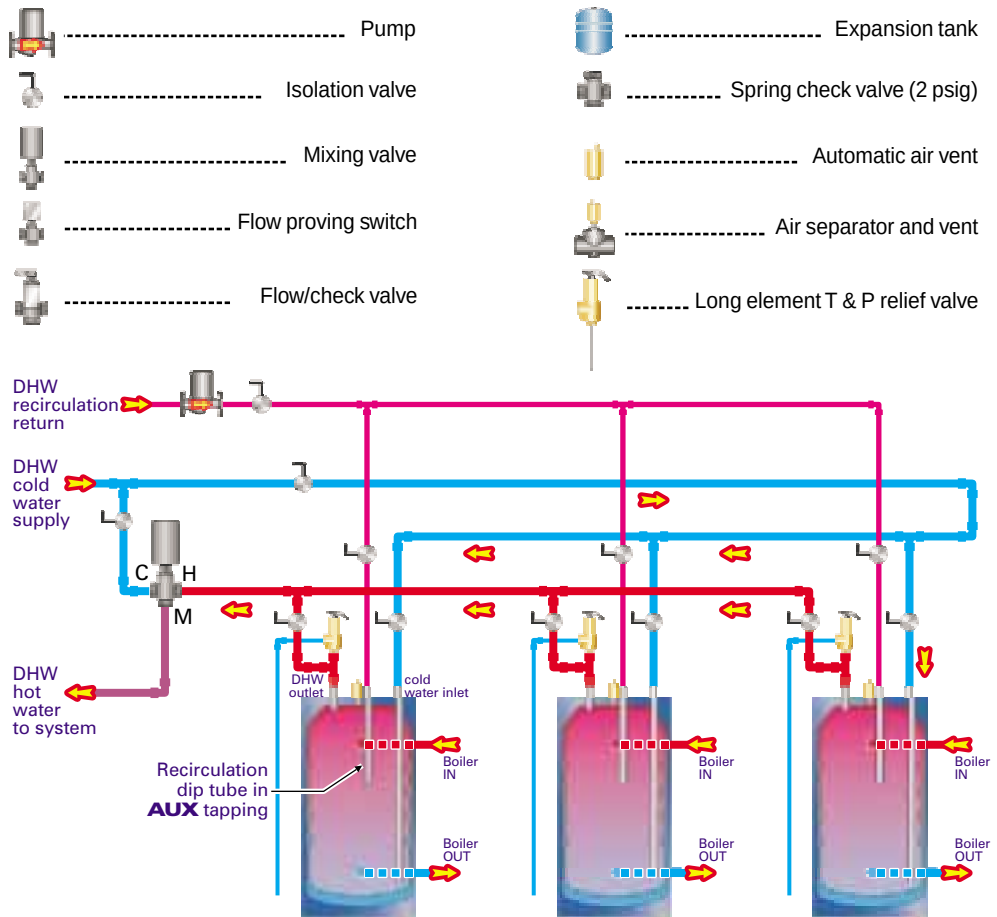
1. These drawings are conceptual only. They show representative piping components and layout. Weil-McLain does not represent that the drawings meet any particular mechanical or building codes. The installer is responsible for inclusion of all required safety devices, or other miscellaneous piping hardware not shown on drawings. The installer is responsible for proper sizing/selection of all hardware shown on this diagram.
2. See Weil-McLain installation instructions for specific details on installing the boiler.
3. Recommended piping for GOLD Plus 30/40/60/80 water heaters used in commercial applications.

I

Piping appendix continued

Figure 15

Multiple water heaters — domestic water piping



Water heaters (front)

Boiler piping shown for PLUS 100 or 120.

Reverse supply and return connections when using GOLD Plus 30/40/60/80.

500075-20

WARNING

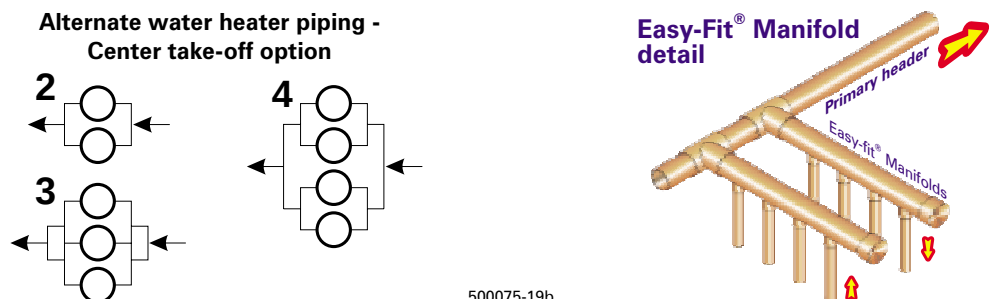
Failure to install automatic mixing valve where recommended can result in severe personal injury or death.

Notes

1. The drawings on this page are conceptual only. They show representative piping components and layout. Weil-McLain does not represent that these drawings meet any particular mechanical or building codes. The installer is responsible for inclusion of all required safety devices, or other miscellaneous piping hardware not shown on drawing. The installer is responsible for proper sizing/selection of all hardware shown on this diagram.
2. Any one PLUS tank thermostat may be utilized to control heater temperature.
3. Install automatic mixing valve at either the system hot water connection or at each water heater.
4. See pages 36-37 for additional recirculation information and piping detail.

Figure 16

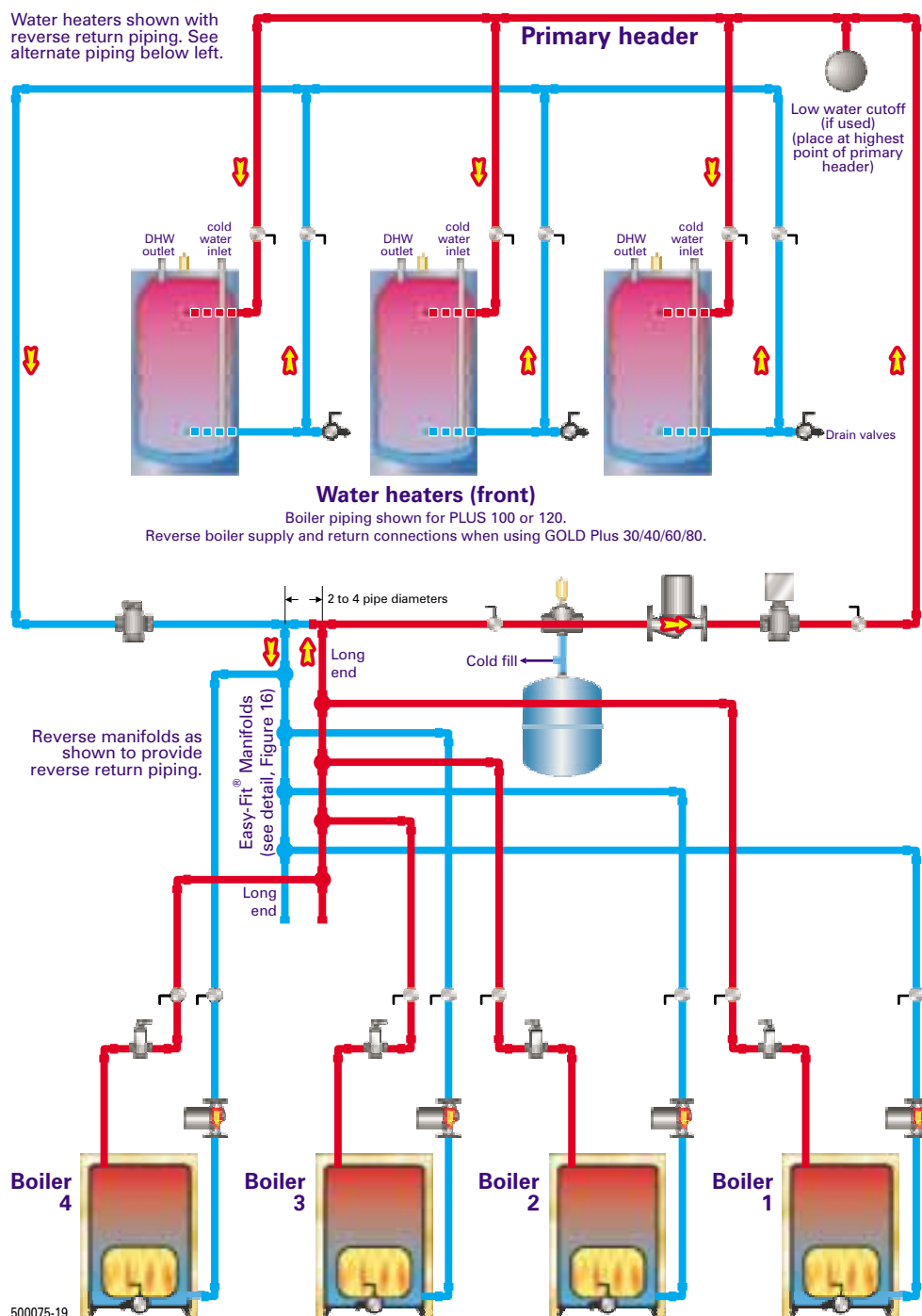
Details for Figure 17, page 33 — alternate water heater piping and Easy-Fit[®] Manifold detail



500075-19b

Figure 17

Multiple water heaters and dedicated multiple boilers — boiler water piping
(see legend and details in Figure 16, page 32)



Notes

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2. See Weil-McLain installation instructions for specific details on installing the boiler.



I Piping appendix continued

WARNING

You must replace the automatic air vent supplied with the water heater with a manual air vent. Failure to do so could result in severe personal injury, death or substantial property damage.

Connecting water heater to steam boiler

When designing steam and domestic hot water systems, there are some key issues that must be taken into consideration during the initial design phase. By designing the system properly from the start, you can avoid problems and have a hot water loop in a steam boiler system.

Special considerations:

- Keep the loop temperature below the flash point. Flashing can result in noise and circulator damage or shortened life.
- Be sure the loop is completely closed, with no automatic air vents or anything that could allow air to enter the system when the pump shuts off. Use manual air vents only to prevent the possibility of flooding the boiler.
- Pipe supply from one side of the boiler, return to the opposite side.
- Supply from a tapping that is high enough to prevent introducing sediment into the piping and circulator yet still positions the circulator below the water line. Avoid the mud leg of the boiler.
- Use an all bronze circulator (avoid wet rotor circulators). This will reduce clogging and will resist the corrosion potential from the steam condensate.
- Make sure the circulator is properly sized. If the pump runs too far out on the curve, cavitation potential increases significantly.
- Return piping should be dedicated domestic return.
- Use (2) flow control valves to reduce the potential for gravity circulation. Do not use spring-loaded check valves in place of the flow/check valves shown in Figure 18 on page 35.

Installation and start-up of water heaters connected to steam boilers

See Figure 18, page 35, for suggested piping schematic. Pipe the boiler and GOLD Plus tank using pipe sizes given in Section B of this manual.

- Boiler connections for the water heater must be below the water line.
- For steam piping, refer to the boiler manual.
- Replace the automatic air vent furnished with the GOLD Plus tank with a manual air vent.
- Wire the GOLD Plus tank and circulator to the boiler per suggested wiring in Figure 18.
- Close ball valves 5 and 6 per piping diagram to isolate the boiler.
- Fill the boiler to the recommended water level per the boiler manual. Fill the domestic side of the GOLD Plus tank per the water heater manual.
- To fill the GOLD Plus tank with boiler water valves 5 and 6 must remain closed. Valves 1 and 2 should be fully opened. Drain valves 3 and 4 should also be fully opened.
- Open water heater manual air vent to bleed the system of air.

NOTICE

Open manual air vent one turn only.

- Fill the boiler/water heater system through drain valve 3 until a steady stream of water flows through drain valve 4, initially purging the system of air.
- Continue to fill the boiler/water heater system while closing drain valve 4.
- When drain valve 4 is fully closed and a steady stream of water is exiting at the air vent, close the manual air vent tightly. Drain valve 3 can now be closed.

CAUTION

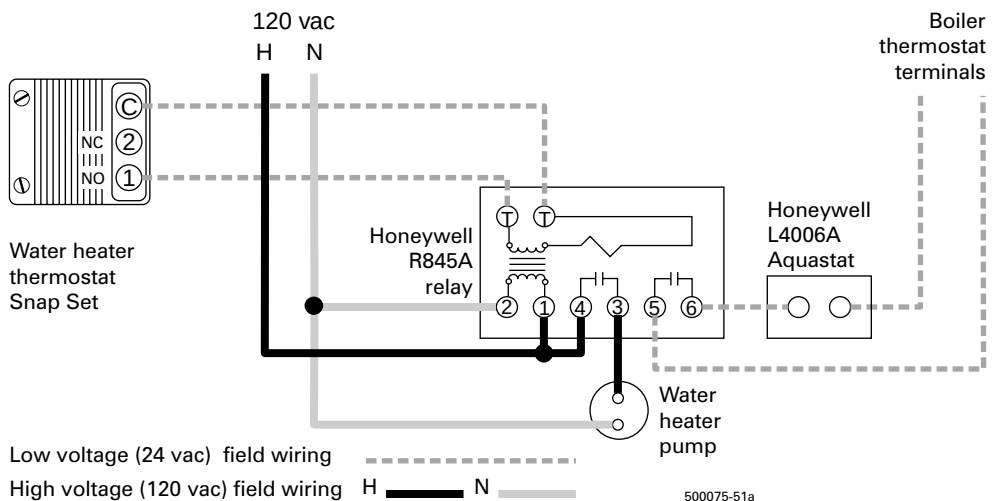
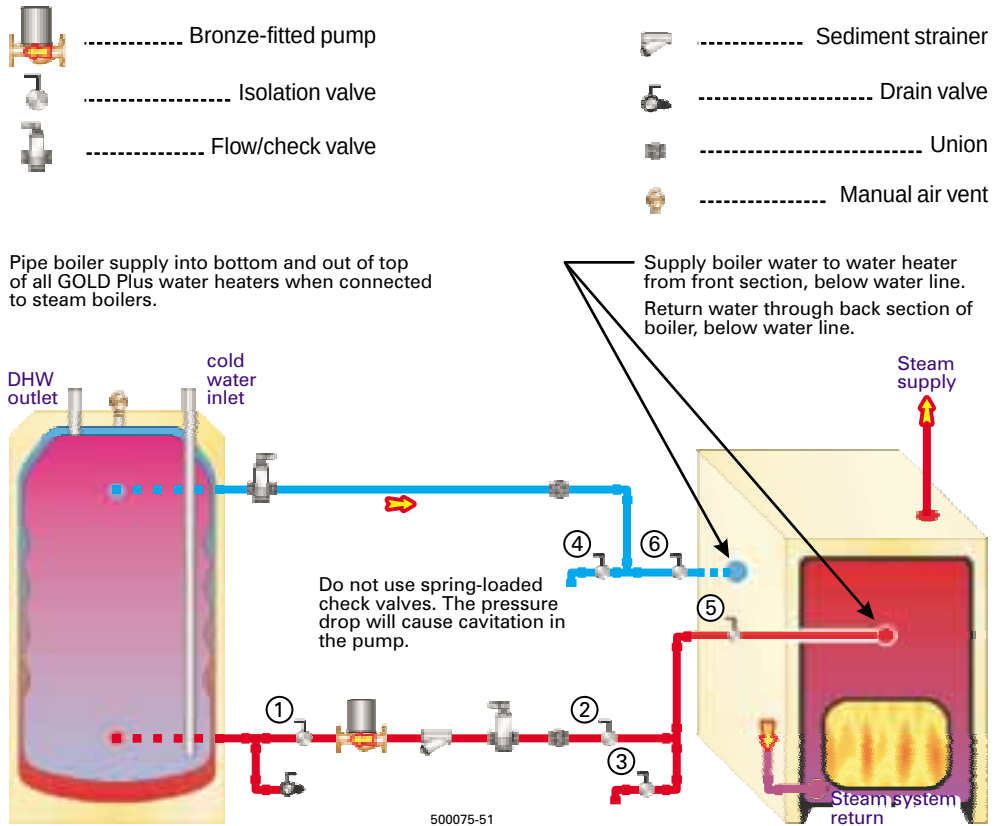
Water may spray from the manual air vent.

- Open valve 5 at the front of the boiler. Then open valve 6.
- Start the boiler per instructions given in the boiler manual.

Figure 18

Domestic water heating using water pumped from steam boiler

- Locate flow/check valve as close as possible to water heater boiler side connections — to reduce heat loss during between cycles.



Notes

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2. See Weil-McLain installation instructions for specific details on installing the boiler.



I Piping appendix continued

Recirculation and heat tracing

Maintaining domestic water temperature in the supply piping

Two options are available to maintain supply temperature available at or near the fixtures on storage water heating systems:

- **Recirculation**

Recirculation is used to reduce wait time for water use, to minimize hot water and energy waste caused during the waiting period, and to prevent degradation of the system supply water temperature. ASPE recommends recirculation when the distance from the water heater to the furthest fixture exceeds 100 feet or the time lag for hot water to reach a fixture(s) exceeds 30 seconds. Consult local codes and American Society of Plumbing Engineers (ASPE) *Domestic Water Heating Design Manual*, 1998, for further information.

- **Self-regulating heat tracing**

Self-regulating heat tracing may be a better alternative than recirculation for residential and small commercial applications. Self-regulating heat tracing uses electrical energy to maintain water temperature, but it eliminates the need for return piping and components required in a recirculation system.

Time delay at fixtures

Table 2 is from the ASPE *Domestic Water Heating Design Manual*, 1998. It shows the time required for usable hot water to arrive at a fixture based on the fixture flow rate (available from industry and manufacturer's data) and the length and diameter of the dead-end branch pipe supplying the fixture. The time lag should generally not exceed 30 seconds. For residential and office applications, the owner may prefer a limit of 10 seconds.

You can use Table 2 as a guide to determining the location of circulation return lines relative to fixtures.

Balancing

When multiple branches are connected to the supply piping, each branch must be connected to the recirculation system. At each of these connections to the return piping, install shutoff valves, a flow metering device, check valve and a strainer as shown in Figure 19 on page 37. Check local code for specific installation requirements.

These branches must be balanced to prevent pipe erosion and unacceptable time delays at some fixtures.

Balancing options include circuit setters, memory stop valves or factory preset devices (with flow metering provision in the piping).

Components required

For residential applications, consult pump manufacturer's data for pump selection and additional components required.

On most commercial systems, install the devices shown in Figure 19, page 37, and any other devices or piping methods required by local codes. The check valves are required to prevent fixtures from taking hot water through the return lines. Shutoff valves are needed to allow cleaning and replacing balancing devices. Include strainers to remove sediment which could damage the pump and/or affect the flow balancing devices.

Size the pump and piping based on the temperature drop allowed between the water available at the water heater and the water delivered at the fixture. The return piping will almost always be smaller than the supply piping, but should never be smaller than ½" to prevent problems with the pump.

Make provision for removal of air in all return lines. Where the returns cannot be vented by topmost fixtures in the system, install automatic air venting at the top of the return piping.

Connecting to the water heater

Install a recirculation dip tube in the AUX tapping on top of the water heater. This requires mounting the T&P relief valve as shown for Option 2 in the piping diagrams, pages 8 and 10. See Figure 20 for the piping required to the water heater.

Table 2

Time lag to obtain hot water at fixture for branch lengths of 10 and 25 feet

(ASPE *Domestic Water Heating Design Manual*)

Time in seconds required to get hot water at fixture (from ASPE)									
Fixture flow rate (GPM) -		0.5		1.5		2.5		4.0	
Piping length (feet) -		10	25	10	25	10	25	10	25
Copper pipe	½"	25	63	8	21	5	13	3	8
	¾"	48	119	16	40	10	24	6	15
Steel pipe	½"	63	157	21	52	13	31	8	20
	¾"	91	228	30	76	18	46	11	28
CPVC pipe	½"	64	159	21	53	13	62	8	20
	¾"	95	238	32	79	19	48	12	30
NOTE: Select branch size and length for less than 31 seconds delay.									

Figure 19

Recirculation components

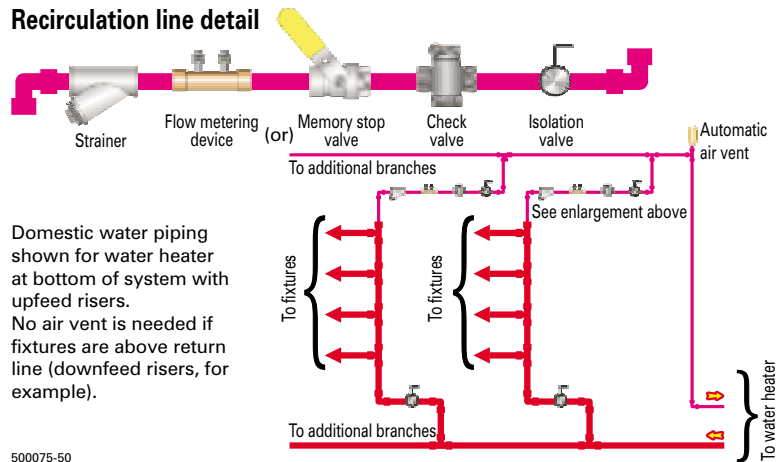
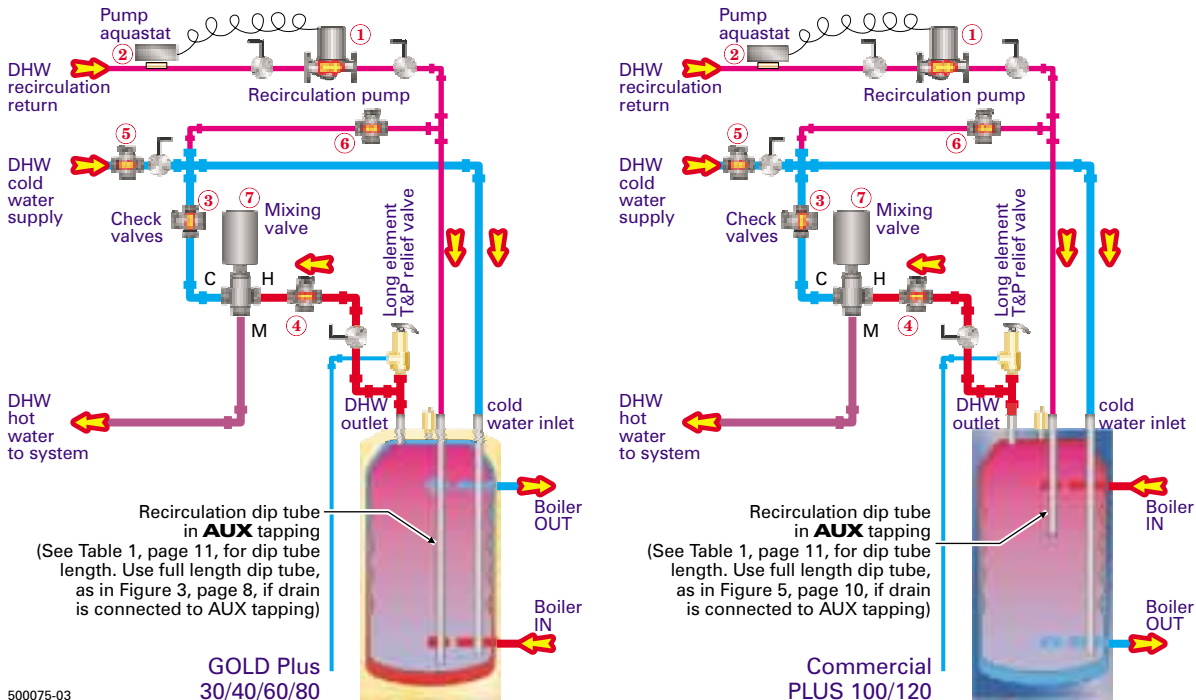


Figure 20 — Recirculation connection at water heater



Components

- 1** Circulator — Little flow is required to maintain a temperature in the piping. Size of circulator depends on minimum flow requirements of the tempering valve. Minimum flow rates of the tempering valve must be maintained.
- 2** Aquastat — Used to control the on-off position of the circulator. Aquastat is set 5° to 10° lower than mixed water outlet of the mixing valve (#7). The circulator cannot run continuously as bypass through the mixing valve will eventually allow the temperature on the piping to climb to the water heater temperature during draw periods.
- 3—6** Check valves — Assure the flow of water in one direction. Each check valve functions as follows: #3 and #4 prevent bypass in the event of pressure drop, #5 prevents thermal siphoning of hot water to the cold water supply, #6 prevents flow of cold water to the tempered water supply. A draw of tempered water will not result in flow of cold water into the return loop.

Operation

- During period of normal use (fixtures on) — Circulator is off. There is no flow through #6, there is flow through #5 equal to the flow at the fixtures, there is flow through #3 and/or #4 equal to flow at fixture.
- When all fixtures are off — Circulator is off. There is no flow through #3, #4,

#5 or #6. Water temperature in piping is cooling.

- When temperature at aquastat #2 falls 10° below temperature to be maintained — Circulator is on. There is flow through #6 equal to the minimum required by the mixing valve, flow through #3 and #4 equals the flow of the circulator. There is no flow through #5.
- Aquastat reaches temperature — Circulator is off. There is no flow through #3, #4, #5 or #6.

Problems

- Missing check valves #3 or #4 — Extreme pressure drop can cause reverse flow of water; hot to cold supply or cold to hot supply.
- Missing check valve #5 — Hot water can migrate from the water heater back through the cold water supply.
- Missing check valve #6 — Cold water can be forced back through the tempered water supply when a fixture is opened.
- No aquastat #2 — Pump runs continuously. Small amount of water will pass through mixing valve. Eventually all hot water is flowing through valve. Recirculated water through cold port, hot water through hot port.
- Circulator too small — Mixing valve performance erratic.



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Wiring appendix

WARNING

Electrical shock hazard.
Can cause severe personal injury, death or substantial property damage.
Disconnect power before installing and/or servicing.

Wiring requirements

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 — CSA C22.1 Canadian Electrical Code Part 1 and any other national, provincial and local code requirements having jurisdiction.
2. If original wire as 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 are shown with no power applied - off shelf condition.

Circulators

6. Size priority relay for total amp draw of all circulators.

Zone Valves

7. Size transformer for maximum load of all zone valves.
8. Priority valve (Figures 30-32, pages 48-50) is closed when heating domestic water. Domestic priority is recommended for the following boilers combined with GOLD Plus 30 water heaters:

Table 3

Boiler models requiring domestic priority when used with GOLD Plus 30

Boiler Models	
CGa	25/3/4/5/6/7/8
GV, CGi, CG, CGs, CGX	3/4/5/6
EG	35/40/45/50
68, GO	2/3/4



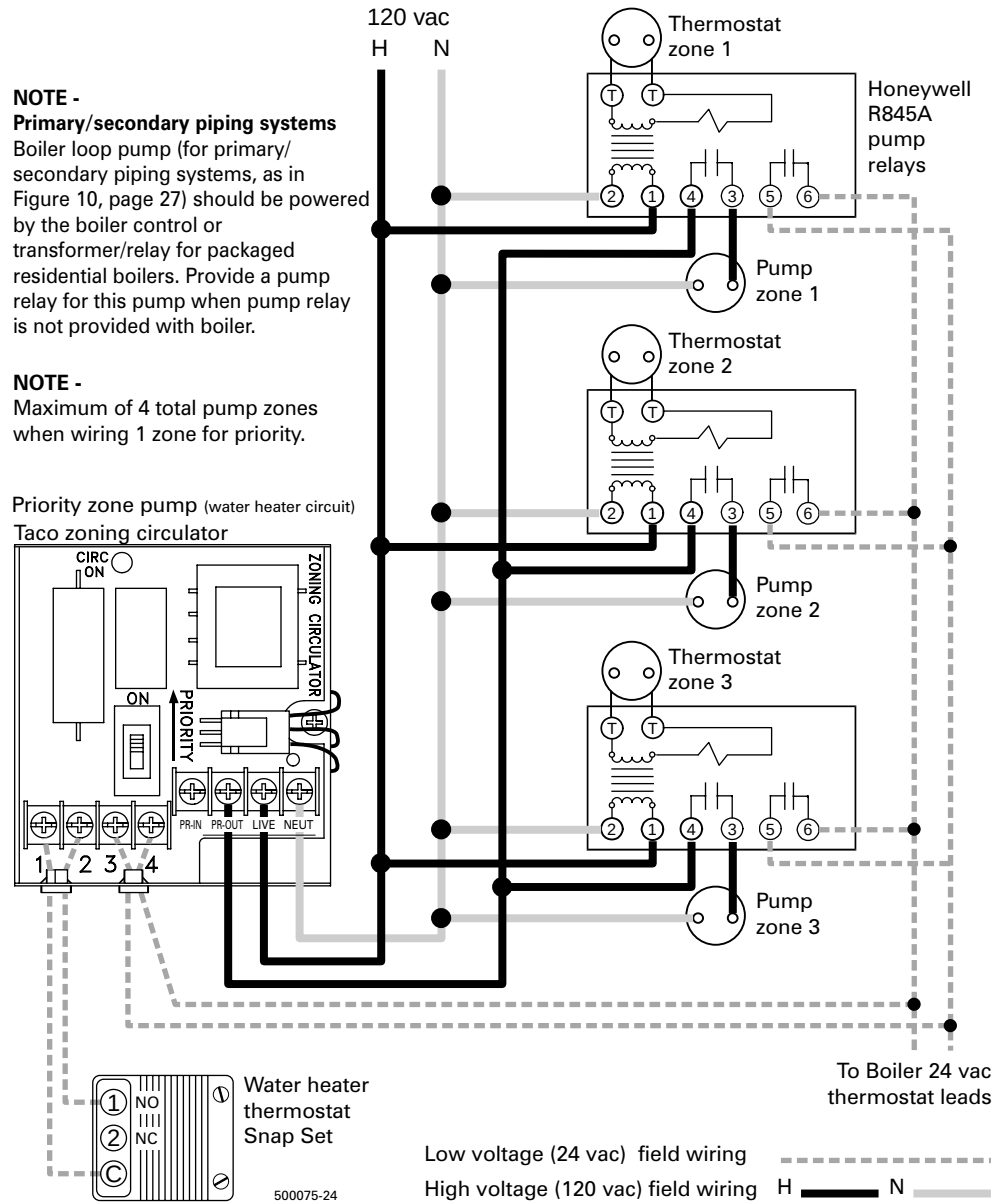
Figure 21

Typical wiring :

- **Zoning with pumps**
- **Using priority zone pump**
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.
- See also Figures 22 and 23, pages 40 and 41, for wiring connections to GO and 68 water boilers when using priority zone pump.

Apply this wiring to systems in:

- Figure 9, page 26
- Figure 10, page 27



Notes

1. These drawings are conceptual only. They show representative piping components and layout. Weil-McLain does not represent that the drawings meet any particular mechanical or building codes. The installer is responsible for inclusion of all required safety devices, or other miscellaneous piping hardware not shown on drawings. The installer is responsible for proper sizing/selection of all hardware shown on this diagram.
2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

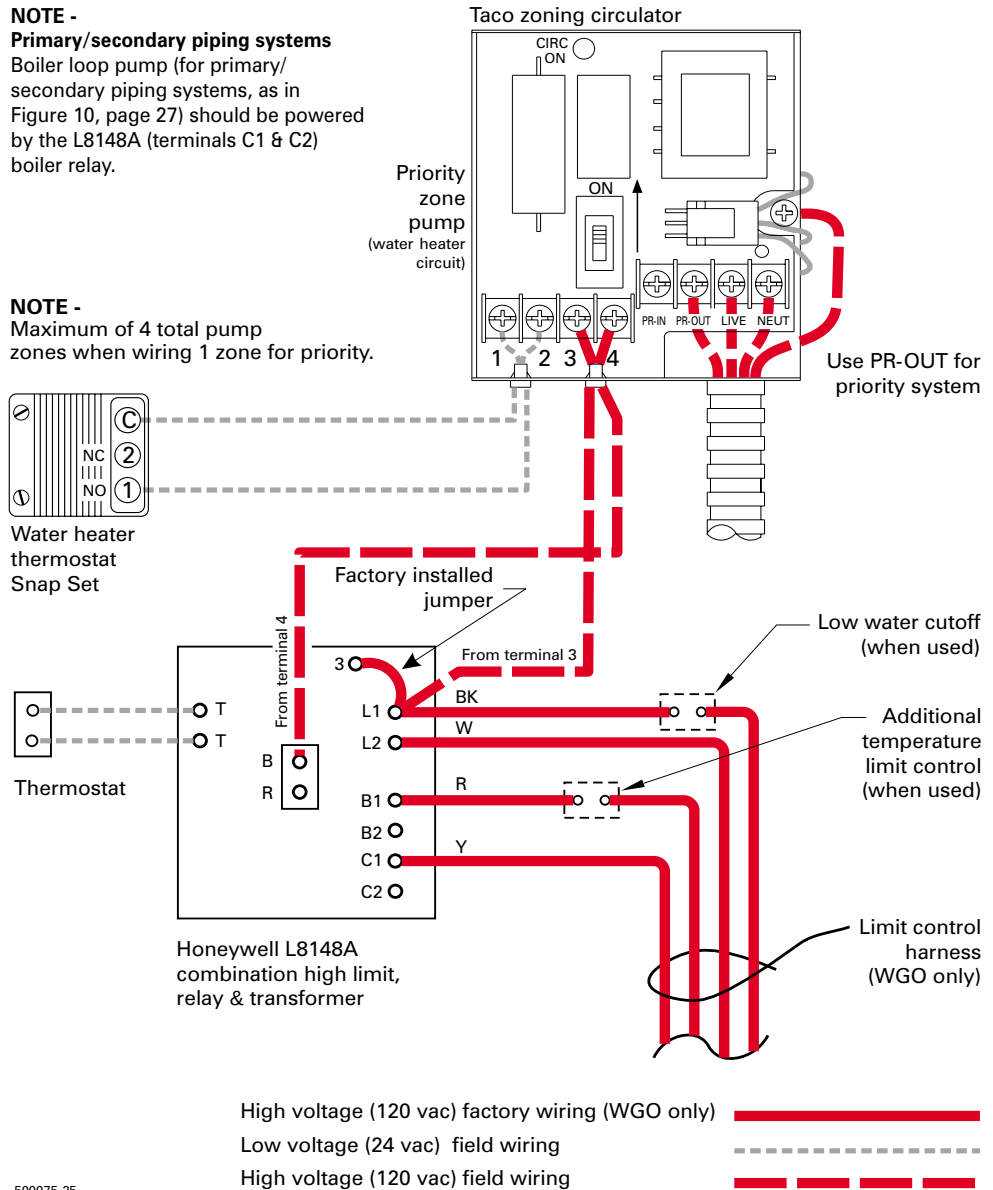
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Wiring appendix continued

Figure 22

Typical wiring – boiler connections:

- Zoning with pumps
- Using priority zone pump
- See Figure 21, page 39, for water heater and zone connections to priority zone pump.
- Refer to *Wiring requirements* on page 38.



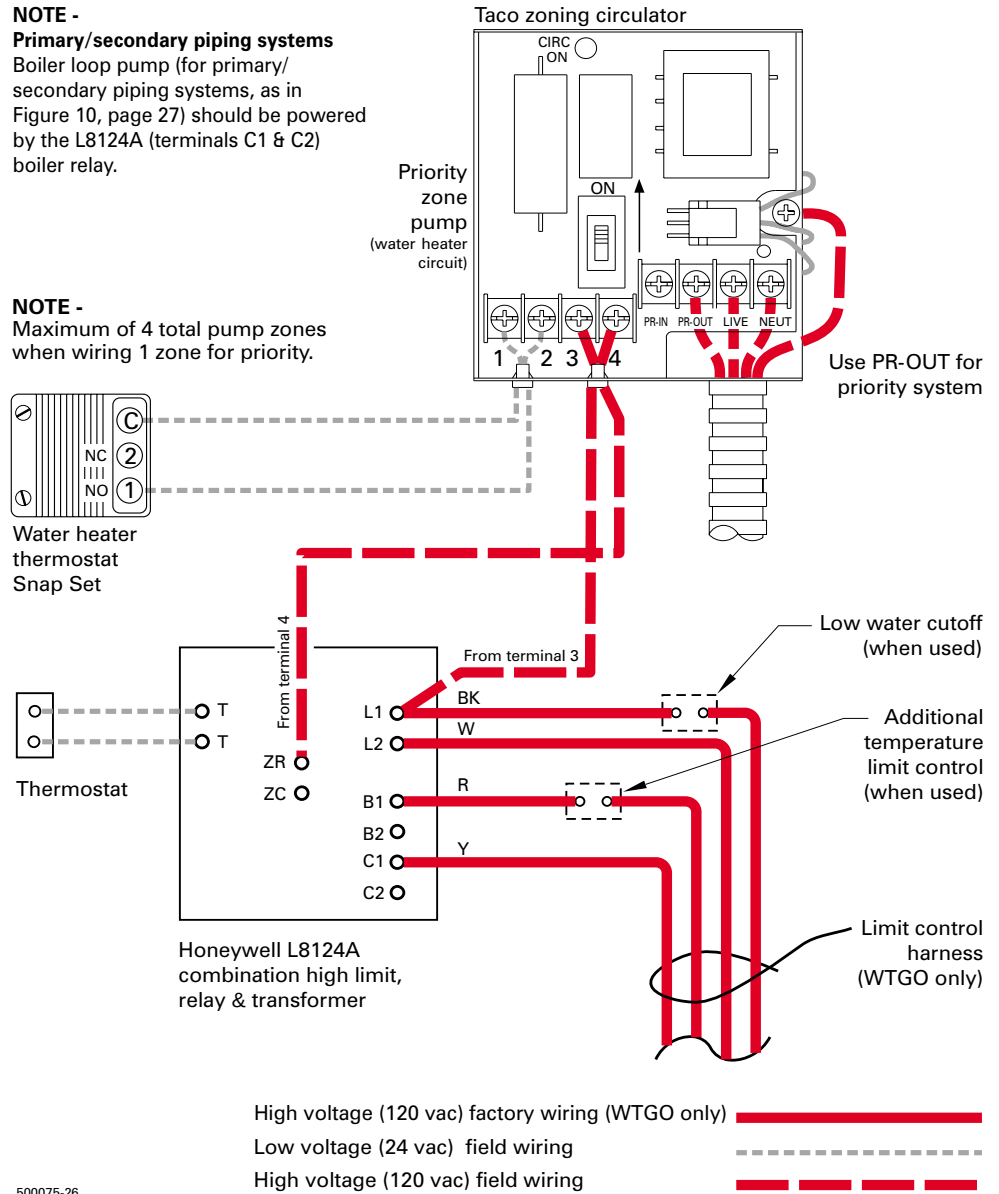
Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

Figure 23

Typical wiring – boiler connections:

- **Zoning with pumps**
- **Using priority zone pump**
- See Figure 21, page 39, for water heater and zone connections to priority zone pump.
- Refer to *Wiring requirements* on page 38.



500075-26

Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.



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Wiring appendix – continued

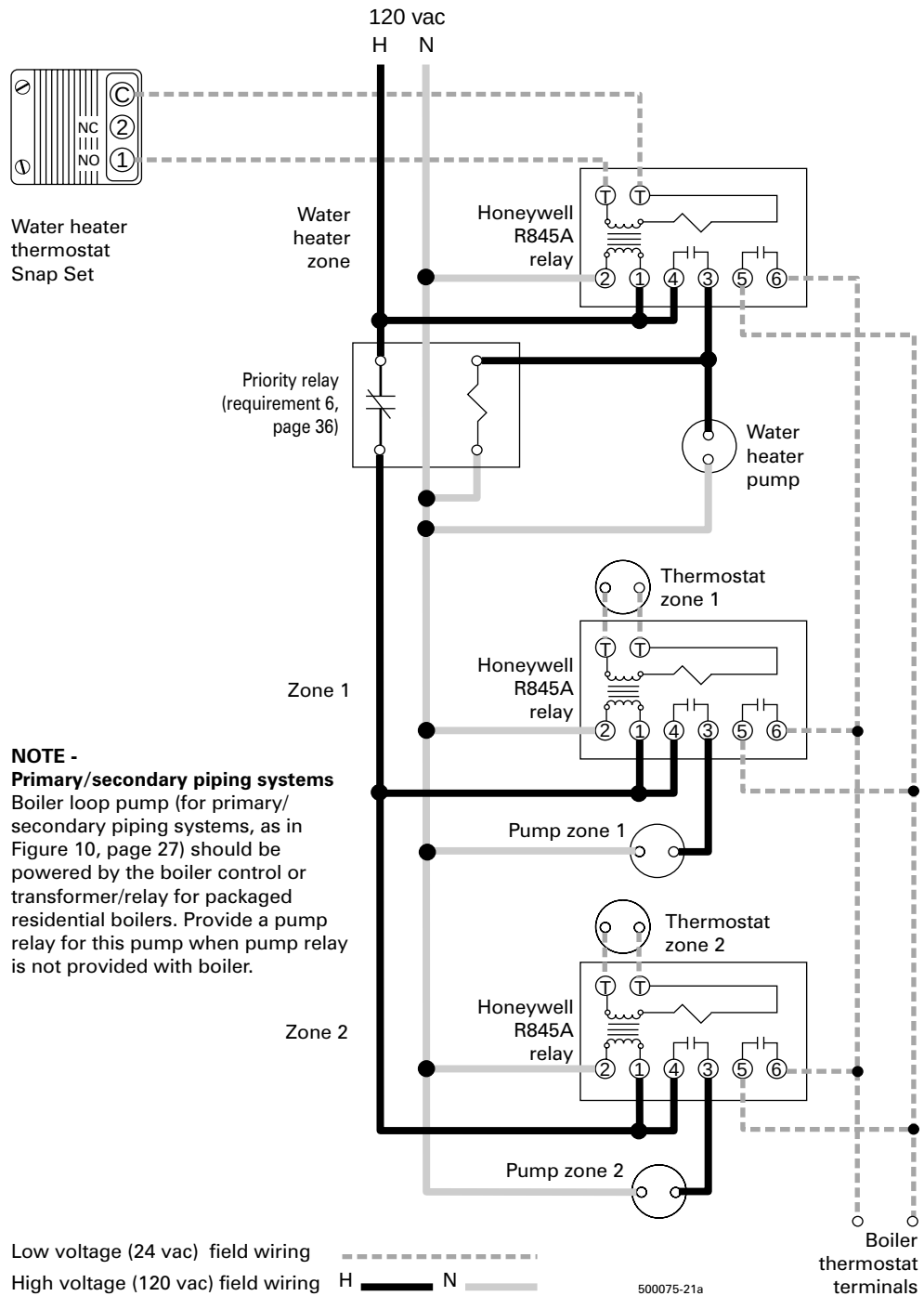
Figure 24

Typical wiring:

- Zoning with pumps
- Using pump relays
- Domestic priority with priority relay
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 9, page 26
- Figure 10, page 27



NOTE -
Primary/secondary piping systems
Boiler loop pump (for primary/secondary piping systems, as in Figure 10, page 27) should be powered by the boiler control or transformer/relay for packaged residential boilers. Provide a pump relay for this pump when pump relay is not provided with boiler.

Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.



Figure 25

Typical wiring:

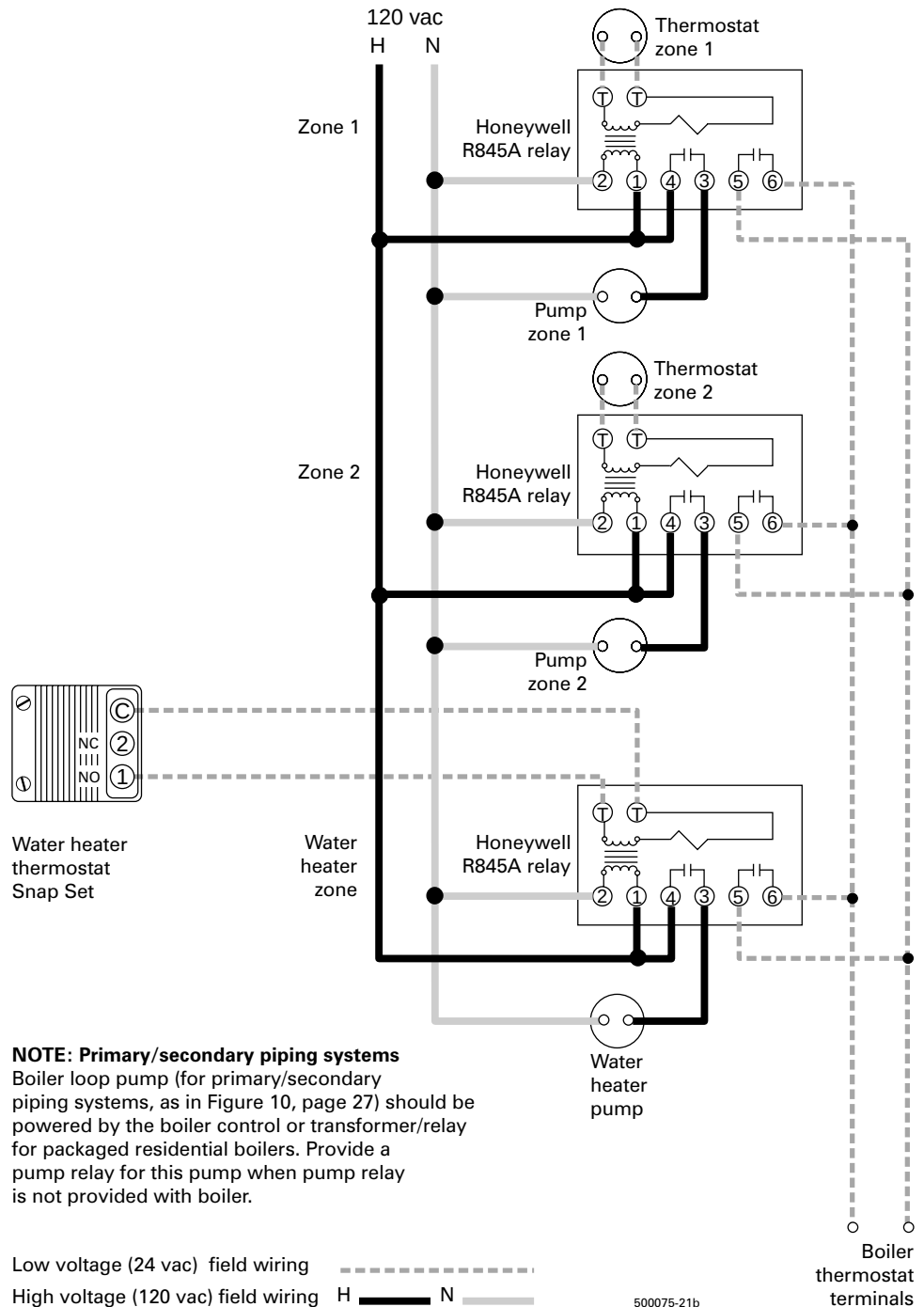
- Zoning with pumps
- Using pump relays
- No domestic priority

• Also refer to *Weil-McLain Boiler Zone Wiring Guide* for further details.

• Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 9, page 26
- Figure 10, page 27



Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

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Wiring appendix – continued

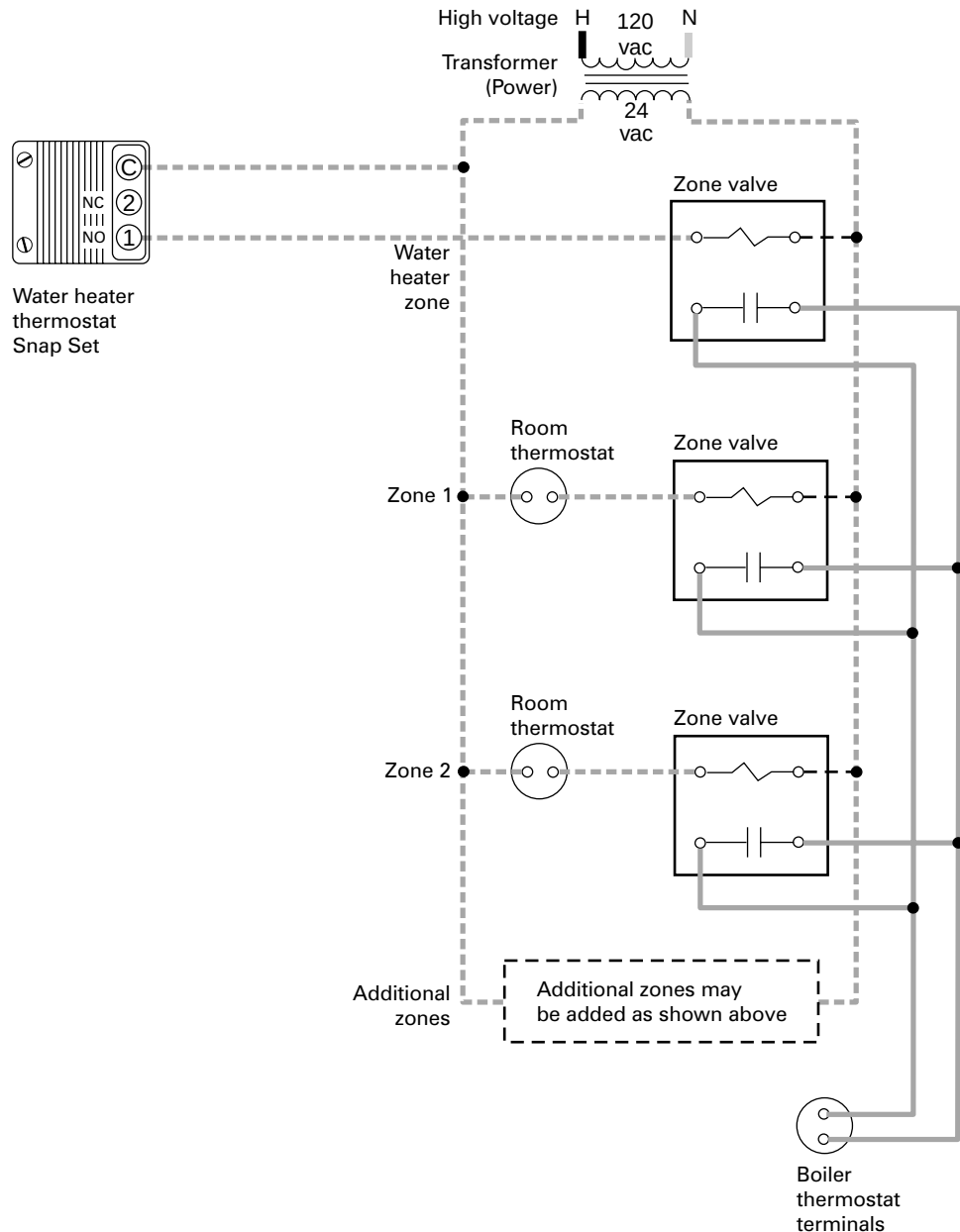
Figure 26

Typical wiring:

- Zoning with 4-wire zone valves
- No domestic priority
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 11, page 28 (using 2-way water heater zone valve and no priority valve)



Low voltage boiler field wiring —————

Low voltage (24 vac) field wiring - - - - -

High voltage (120 vac) field wiring H ——— N ———

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Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

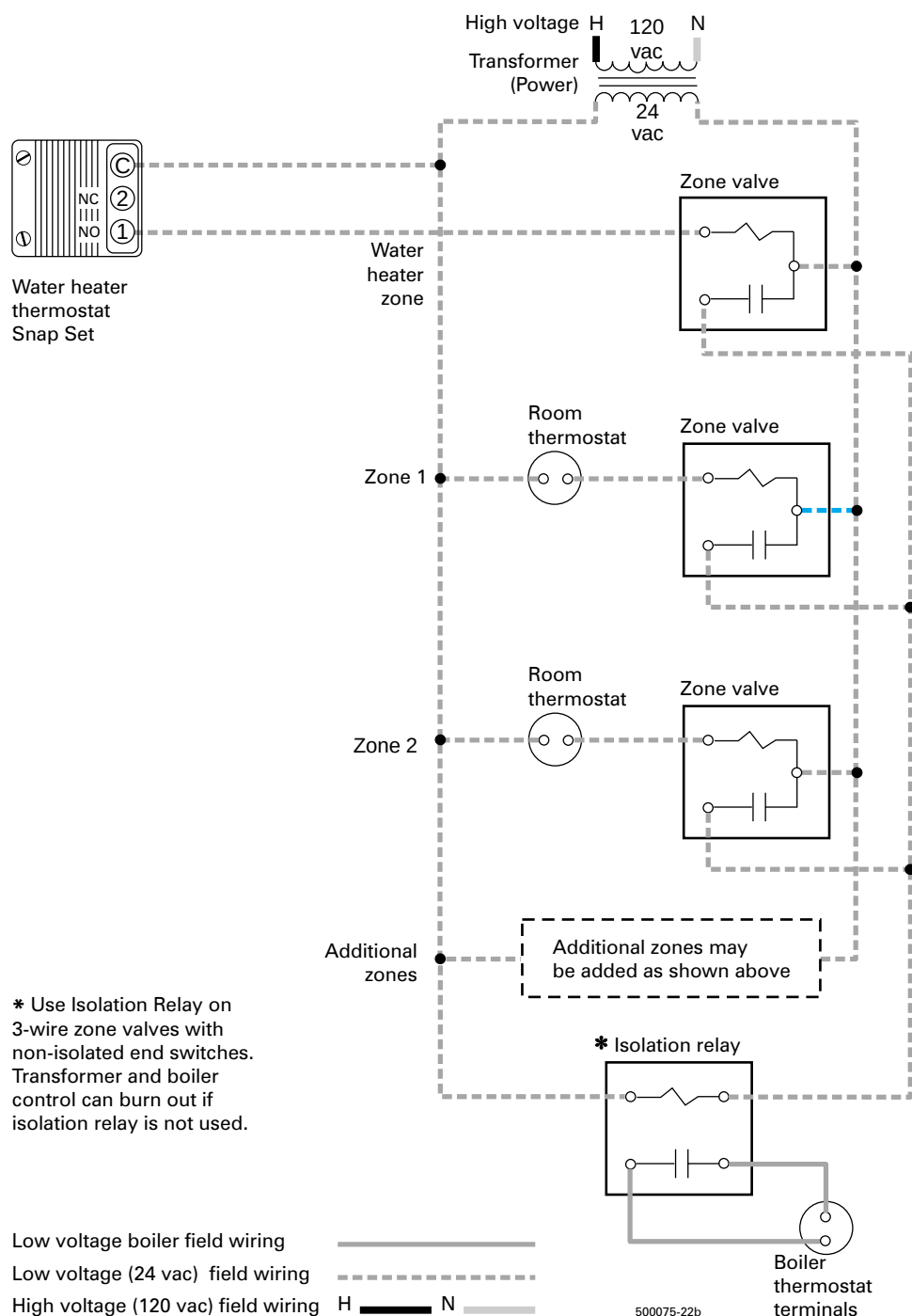
Figure 27

Typical wiring:

- Zoning with 3-wire zone valves
- No domestic priority
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 11, page 28 (using 2-way water heater zone valve and no priority valve)



* Use Isolation Relay on 3-wire zone valves with non-isolated end switches. Transformer and boiler control can burn out if isolation relay is not used.

Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

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Wiring appendix – continued

Figure 28

Typical wiring:

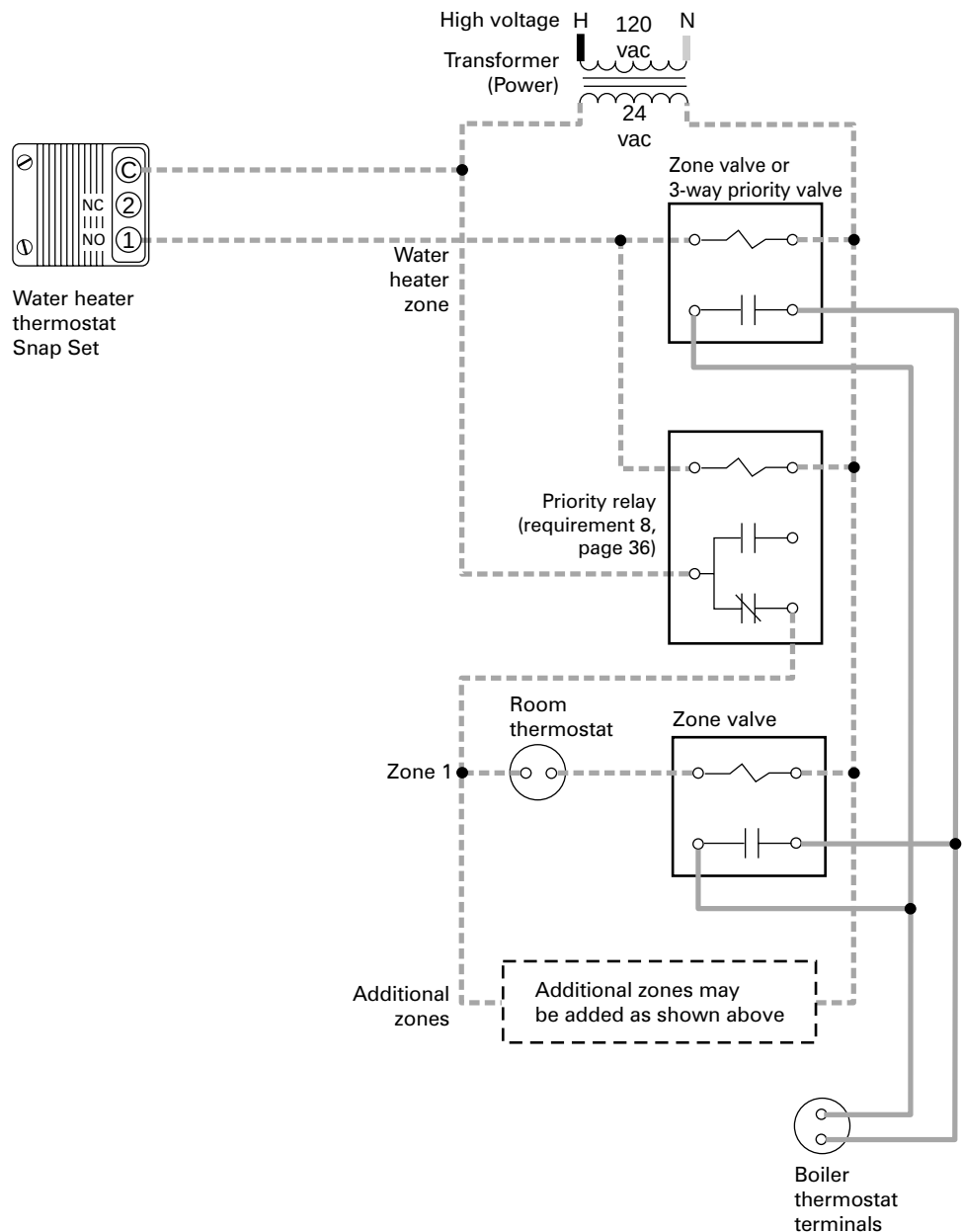
- Zoning with 4-wire zone valves
- With OR without domestic priority
- GOLD Plus 30/40/60/80

• Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.

• Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 11, page 28 (using 3-way priority valve or NO priority using 2-way water heater zone valve and no priority valve)



Low voltage boiler field wiring —————
 Low voltage (24 vac) field wiring - - - - -
 High voltage (120 vac) field wiring H ——— N ———

500075-23a

Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.



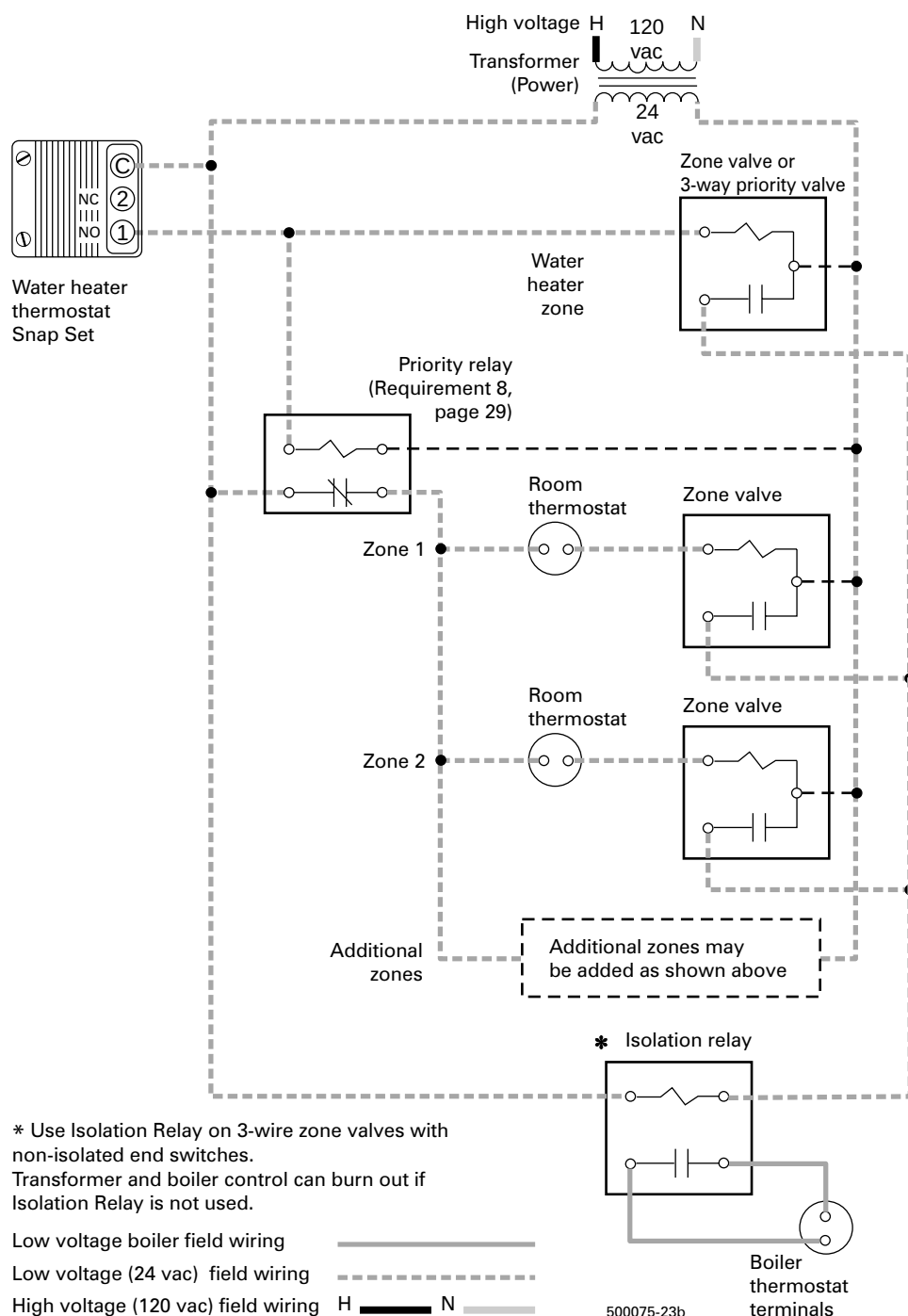
Figure 29

Typical wiring:

- **Zoning with 3-wire zone valves**
- **With OR without domestic priority**
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 11, page 28 (using 3-way priority valve or NO priority using 2-way water heater zone valve and no priority valve)



* Use Isolation Relay on 3-wire zone valves with non-isolated end switches. Transformer and boiler control can burn out if Isolation Relay is not used.

Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

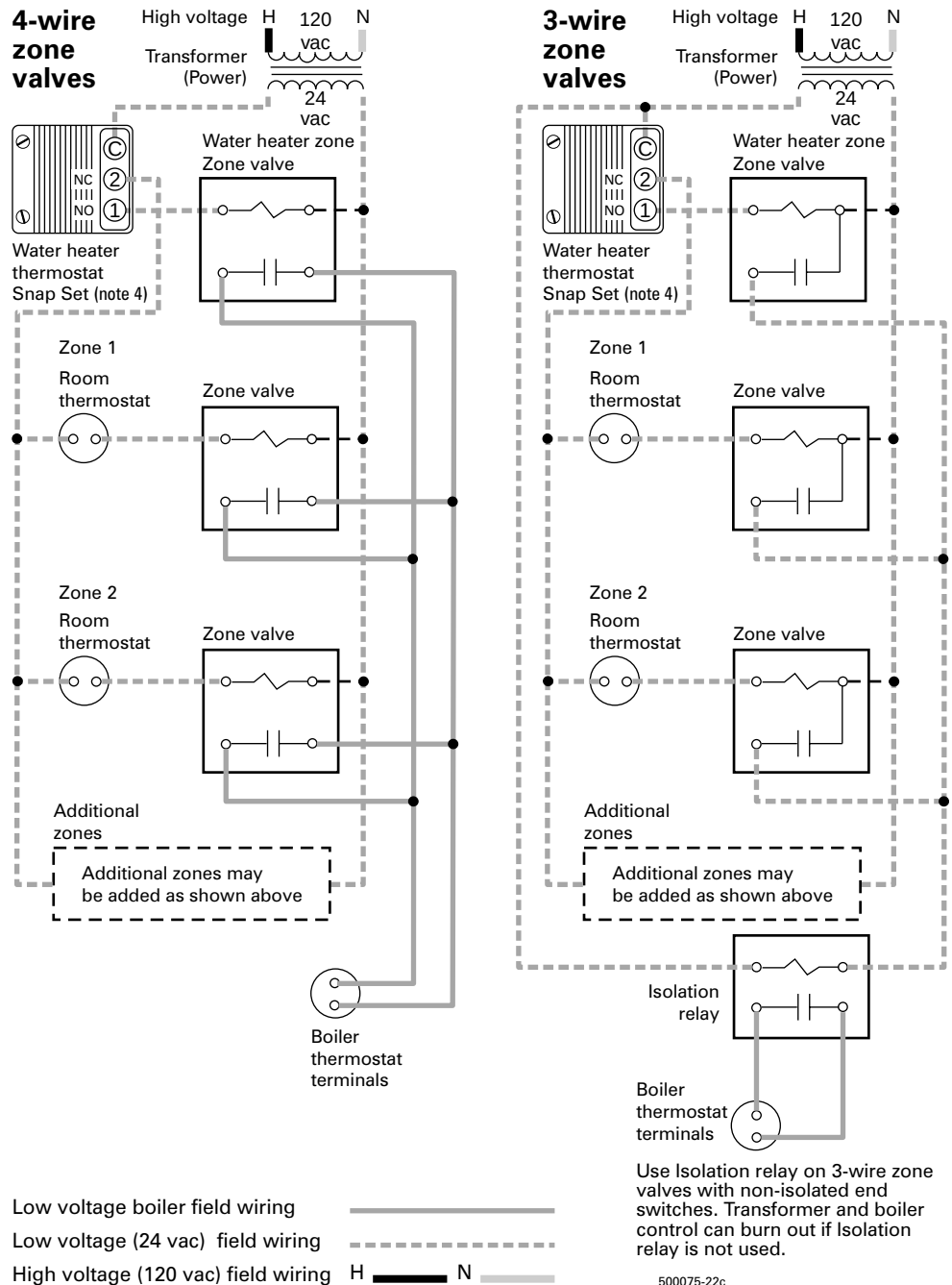
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Wiring appendix – continued

Figure 30

Typical wiring:

- Zoning with zone valves
- With domestic priority
- PLUS 100/120 only
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.



Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.
4. Contact rating of water heater thermostat is 0.5 amp at 24 VAC.



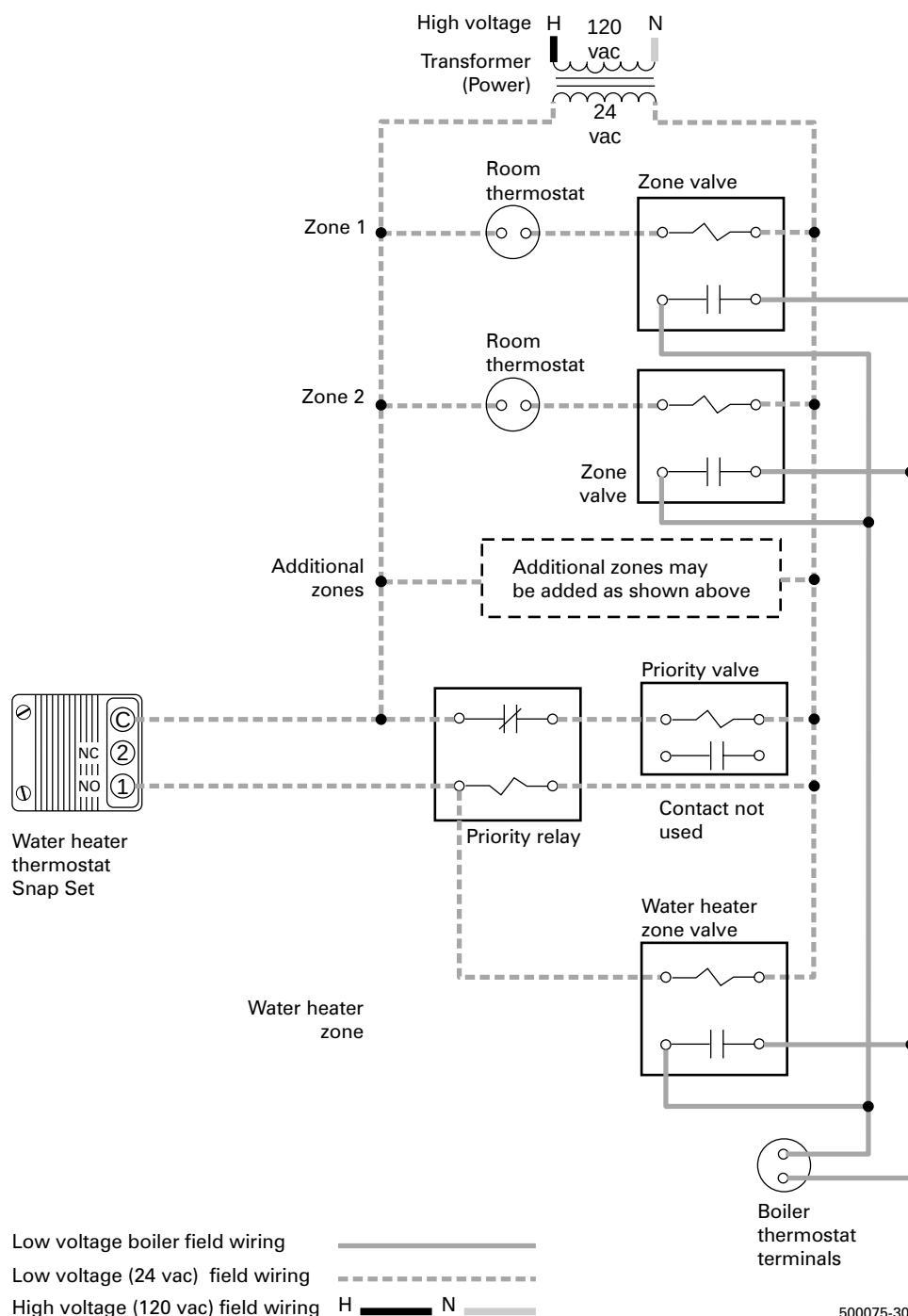
Figure 31

Typical wiring:

- **Zoning with 4-wire zone valves**
- **Domestic priority with 2-way priority valve**
- Also refer to *Weil-McLain Boiler Zone Wiring Guide* for further details.
- Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 11 (using 2-way water heater zone valve and 2-way priority valve)



Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

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Wiring appendix – continued

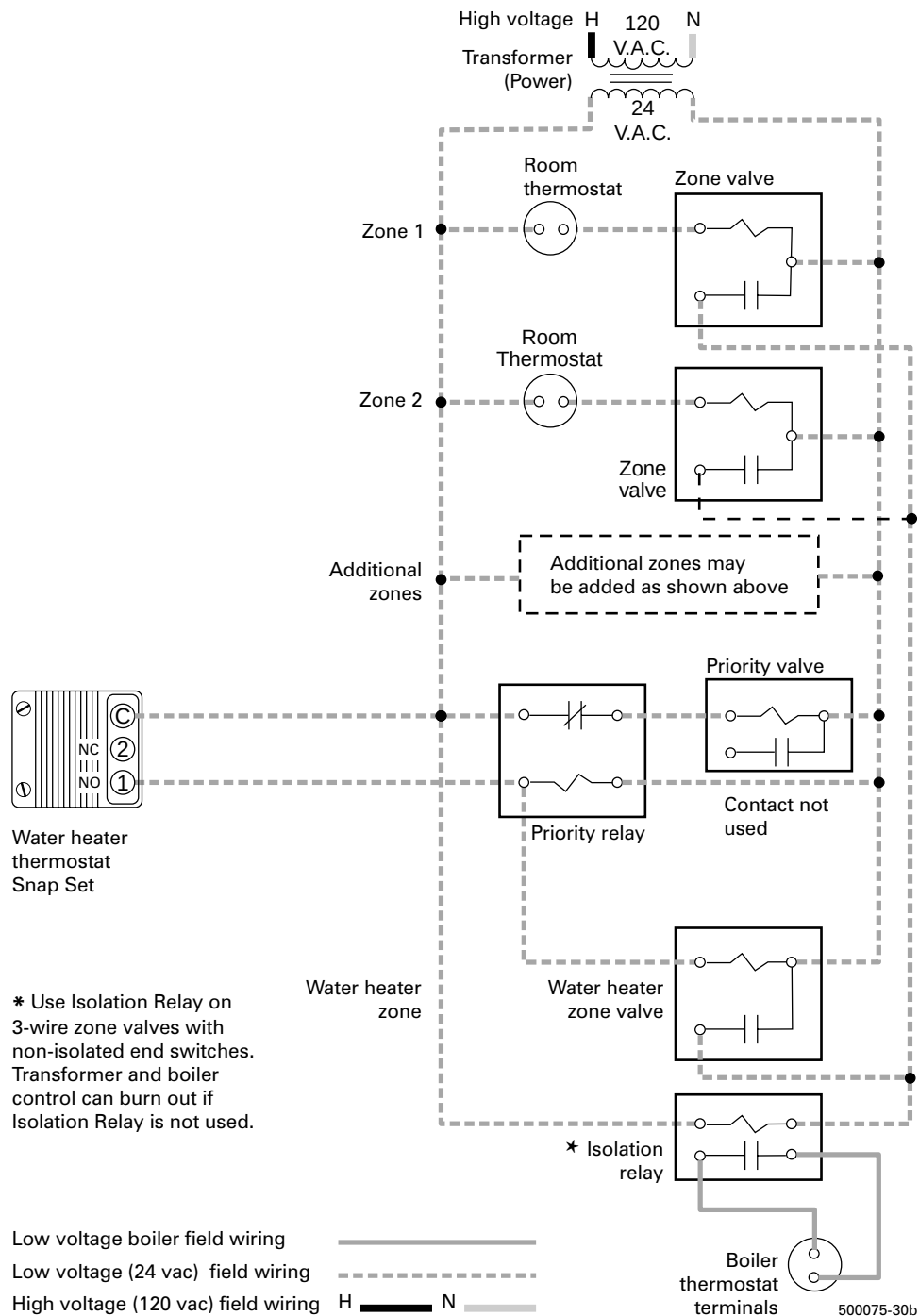
Figure 32

Typical wiring:

- Zoning with 3-wire zone valves
- Domestic priority with 2-way priority valve
- Also refer to **Weil-McLain Boiler Zone Wiring Guide** for further details.
- Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 11, page 28 (using 2-way water heater zone valve and 2-way priority valve)



Notes

1. These drawings are conceptual only. They show representative piping components and layout. Weil-McLain does not represent that the drawings meet any particular mechanical or building codes. The installer is responsible for inclusion of all required safety devices, or other miscellaneous piping hardware not shown on drawings. The installer is responsible for proper sizing/selection of all hardware shown on this diagram.
2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.



Figure 33

Typical wiring:

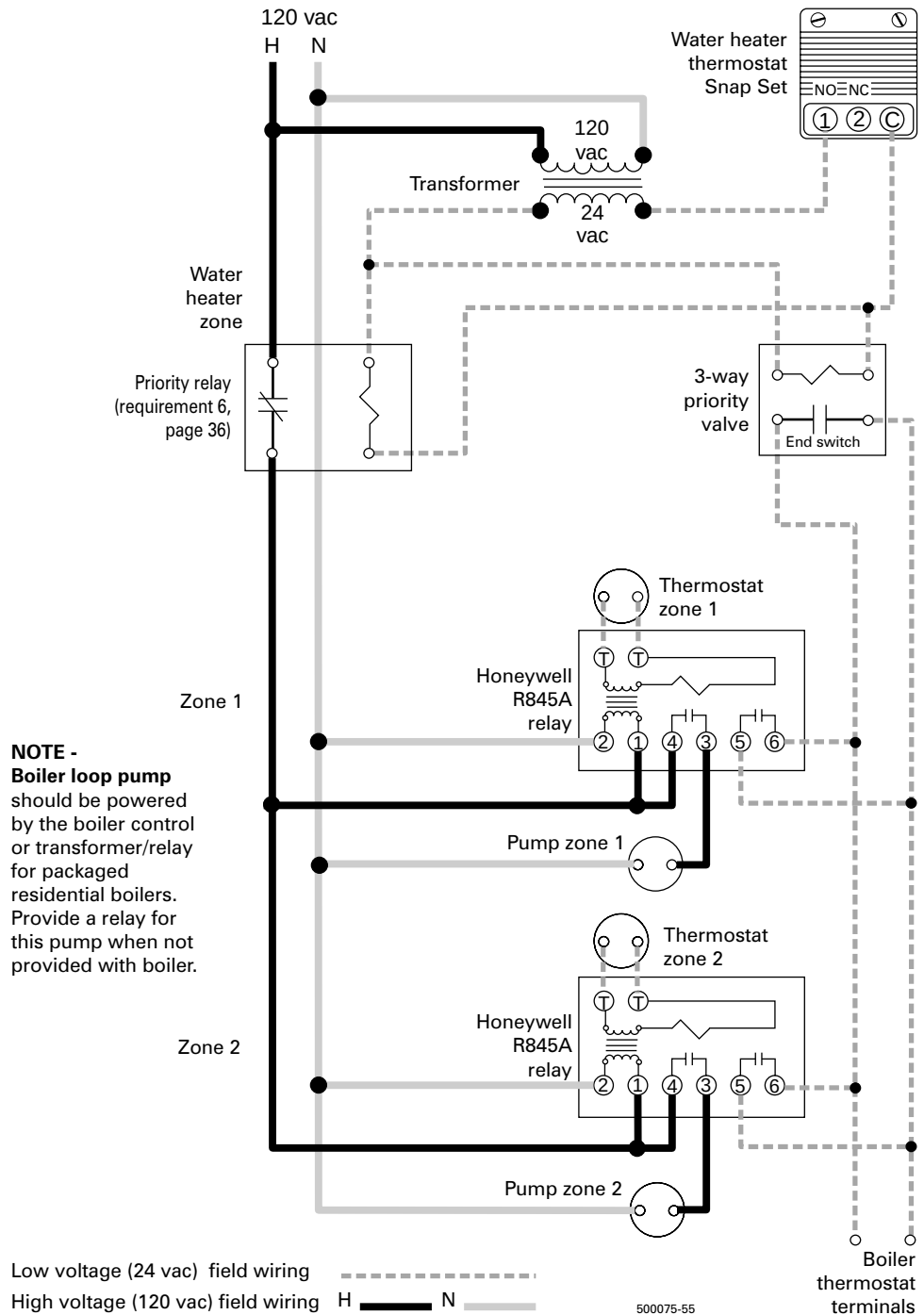
- Zoning with pumps
- Pump relays
- Domestic priority with 3-way priority valve and priority relay

• Also refer to *Weil-McLain Boiler Zone Wiring Guide* for further details.

• Refer to *Wiring requirements* on page 38.

Apply this wiring to systems in:

- Figure 12, page 29



Notes

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2. Follow component manufacturer's instructions for installation of all items shown.
3. See Weil-McLain installation instructions for specific details on installing the boiler.

Weil-McLain Limited Warranty for GOLD Plus & PLUS Indirect-Fired Water Heaters

◆ RESIDENTIAL HEATER WARRANTY—Limited Lifetime

NOTE: The residential warranty does not cover residential indirect-fired water heaters installed in buildings other than one or two family dwelling units, unless they are buildings with individual indirect-fired water heaters for each dwelling unit.

◆ COMMERCIAL HEATER WARRANTY—Limited 15-Year

First Year-(Residential and Commercial)

Limited Warranty for Indirect-Fired Water Heaters:

Weil-McLain warrants that its indirect-fired water heaters are free from defects in material and workmanship for one year from the date of installation. If any parts are found to be defective in manufacture, Weil-McLain will provide replacement of such defective parts.

Second Year and Beyond - (Residential Only)

Second Through Fifth Years - (Commercial Only)

Limited Warranty for the Tank Assembly:

Weil-McLain warrants that the tank assembly components of its indirect-fired water heaters are free from defects in material and workmanship for the second through fifth year from the date of installation (commercial only), or for the second year from the date of installation and beyond (for residential only). If, during such time periods, a leak in the tank assembly should occur, Weil-McLain will provide replacement for the original tank assembly.

Sixth Year through Fifteenth Year - (Commercial Only)

Limited Warranty for the Tank Assembly:

Weil-McLain warrants that the tank assembly components of its commercial indirect-fired water heaters are free from defects in material and workmanship for the sixth year through the fifteenth year following the date of installation. If, during such time period, a leak in the tank assembly should occur, Weil-McLain will provide replacement for such defective tank assembly. Such replacement will be furnished with the nearest comparable model available from Weil-McLain at the time of such replacement. The proportionate charge will be equal to the appropriate percentage of the current list price of such commercial indirect-fired water heater at the time the warranty claim is made, and will be determined as follows:

6th through 7th year - 55%; 8th through 9th year - 60%;
10th through 11th year - 65%; 12th through 13th year - 70%;
14th through 15th year - 75%

All Residential and Commercial Indirect-Fired Water Heaters

This warranty is subject to the condition that the indirect-fired water heater must have been installed by a heating contractor whose principal occupation is the sale and installation of plumbing, heating and/or air conditioning equipment.

These warranties do not cover:

1. Components that are part of the indirect-fired water heater system but were not furnished by Weil-McLain as a part of the indirect water heater.
2. The workmanship of any installer of Weil-McLain's indirect-fired water heater. In addition, this warranty does not assume

any liability of any nature for unsatisfactory performance caused by improper installation.

3. Any costs for labor for removal and installation of the alleged defective part, transportation to Weil-McLain, if necessary, and any other materials necessary to perform the exchange.
4. Any indirect-fired water heater that does not have installed a new temperature-pressure relief valve bearing the listing of the American Society of Mechanical Engineers (A.S.M.E.) at the time of the water heater installation.
5. Any indirect-fired water heater that has a failure or malfunction resulting from improper or negligent operation, accident, abuse, freezing, misuse, unauthorized alteration or improper repair or maintenance.
6. Any indirect-fired water heater that has a failure or malfunction resulting from a) failure to keep the tank full of potable water; b) failure to assure that water in the tank is free to circulate at all times; or c) failure to keep the tank free of water sediment or scale deposits.
7. Any indirect-fired water heater that has potable water in the unit with a chloride or chlorine content higher than 80 mg/liter.
8. Any indirect-fired water heater that is installed in a residence containing any type of water softener system that is not installed and maintained in accordance with the manufacturer's specifications.
9. Any indirect-fired water heater installation where non-metallic piping products without an oxygen barrier are used.
10. Any indirect-fired water heater that is used for non-potable application such as pool or process heating.

These warranties extend only to the first retail purchaser of the indirect-fired water heater and only to an indirect-fired water heater that has not been moved from its original installation site.

THE WARRANTIES DESCRIBED ABOVE ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. WEIL-McLAIN EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY.

For prompt product warranty claims, notify the installer who, in turn, will notify the Weil-McLain distributor from whom he purchased the indirect-fired water heater. If this action does not result in warranty resolution, contact Weil-McLain Consumer Relations Department, 500 Blaine Street, Michigan City, Indiana 46360-2388, with details in support of the warranty claim. Alleged defective part or parts must be returned through trade channels in accordance with the Weil-McLain procedure currently in force for handling returned goods for the purpose of inspection to determine cause of failure. Weil-McLain will furnish new part(s) to an authorized Weil-McLain distributor who, in turn will furnish the new part(s) to the heating contractor who installed the indirect-fired water heater. If you have any questions about the coverage of this warranty, contact Weil-McLain at the address above.



WEIL-McLAIN
A United Dominion Company

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