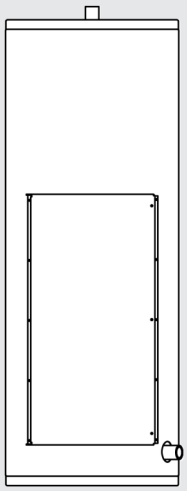
MODELS:

RCET5012 RCET8012
RCET5018 RCET8018



CERTIFIED TO UL 1453

Commercial Electric Water Heater

Installation and Operation Manual

Rinnai

⚠ WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury, or death.

- Installation and service should be performed by a trained and qualified professional or service agency.
- If the water heater becomes submerged in water up to the level of the electrical elements, the heater should be examined by a qualified service agency before it is placed in operation.

Contents

1. Welcome

Thank you for purchasing a Rinnai commercial electric water heater. Before installing and operating this water heater, be sure to read these instructions completely and carefully to familiarize yourself with the water heater's features and functionality.

1.1 To The Installer

- It is recommended that a trained and qualified professional who has attended a Rinnai training class complete the installation. The warranty may be voided due to any improper installation. Training on Rinnai products is accessible at rinnaipro.myabsorb.com.
- A trained and qualified professional should have skills such as:
  - Connecting water lines, valves, and electricity
  - Knowledge of applicable national, state, and local codes
- Read all instructions in this manual before installing the water heater. The water heater must be installed according to the exact instructions in this manual.
- Proper installation is the responsibility of the trained and qualified professional.
- When installation is complete, leave this manual with the water heater (for internal/indoor units) or give the manual directly to the consumer.
- Massachusetts Code requires this water heater to be installed in accordance with Massachusetts 248-CMR 2.00: State Plumbing Code and 248-CMR 5.00
- For installation in California, this water heater must be braced or anchored to avoid falling or moving during an earthquake.

1.2 To The Consumer

- You must read the entire manual to properly operate the water heater and to have regular maintenance performed.
- Keep this manual for future reference.
- As when using any appliance generating heat, there are certain safety precautions you should follow. See section "2.2 Safety Precautions" for detailed safety precautions.
- Be sure your water heater is installed by a trained and qualified professional.

1.3 Acronyms and Abbreviations

Table 1 provides a list of common acronyms and abbreviations used in this manual:

Table 1. Acronyms and Abbreviations

ANSI	American National Standards Institute
Btu	British Thermal Unit
DHW	Domestic Hot Water
GPM	Gallons per minute
kW	Kilowatt
NEC	National Electrical Code
NFPA	National Fire Protection Association
UL	Underwriters Laboratory
T&P	Temperature and Pressure Relief Valve
PSI	Pounds per Square Inch

2. Safety

⚠ WARNING

If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury, or death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Installation and service should be performed by a trained and qualified professional or service agency.
- The warning signs in this manual are here to prevent injury to you and others. Follow them explicitly.

2.1 Safety Symbols

This manual contains the following important safety symbols. Always read and obey all safety messages.

⚠ WARNING

Indicates an imminently hazardous situation which, if not avoided, will result in personal injury or death.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

⚠ Alerts you to potential hazards that can kill or hurt you and others.

⚠ DANGER

indicates an imminently hazardous situation which, if not avoided, will result in personal injury or death.

2.2 Safety Precautions

The following precautions apply to the installer and consumer. Read and follow all instructions in this section.

⚠ WARNING

Indicates an imminently hazardous situation which, if not avoided, will result in personal injury or death.

- Do not use this water heater if any part has been exposed to flooding or water damage. Immediately call a qualified service technician to inspect the water heater and to replace any part of the control system which has been under water.
- If the unit is exposed to the following, do not operate the water heater until all corrective steps have been made by a qualified service technician.
    1. External Fire
    2. Damage
    3. Dry firing
- Keep the area around the appliance clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- Always check the water temperature before entering a shower or bath.
- To protect yourself from harm, before performing maintenance:
    - Turn off the electrical power supply by turning off the disconnect switch or by turning off the electricity at the circuit breaker. (The temperature controller does not control the electrical power.)
    - This water heater must be grounded in accordance with the NEC and/or local codes in all installations. Failure to ground the water heater properly may also cause control system issues.
- DO NOT use substitute materials. Use only parts certified for the appliance.
- Should overheating occur or the electrical supply fails to shut off, turn off the main breaker to the appliance.

- Only trained and qualified professionals are permitted to adjust parameter settings.
- DO NOT use an extension cord or adapter plug with this appliance.
- Any alteration to the appliance or its controls can be dangerous and will void the warranty.
- EXPLOSION HAZARD. In hot water systems where the hot water has not been used for a long period of time, hydrogen gas can be produced. Hydrogen gas is highly flammable. To reduce the risk of explosion or injury, open a hot water faucet for several minutes before using any electrical appliances. There should also not be any smoking or open flames near the faucet when it is opened.
- DO NOT operate the water heater without the front panel installed. The front panel should only be removed for service/maintenance or replacing internal components. Before removing any access panels or servicing the heater, the electrical supply to the water heater must be turned off. Failure to do so could result in death, serious injury, or property damage.
- BURN HAZARD. Hot water outlet pipes leaving the water heater can be hot to touch.
- DO NOT store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

3. About the Water Heater

3.1 Front and Top Views

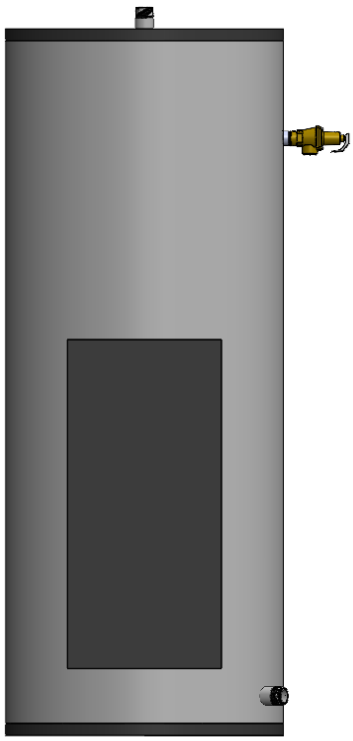


Figure 1: Front View

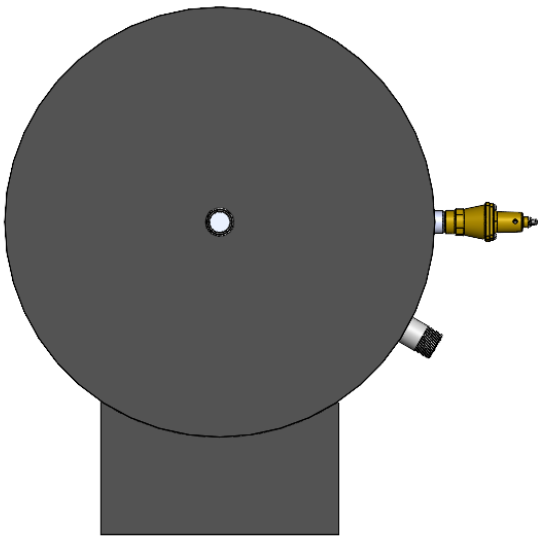


Figure 2: Top View

3.2 Components

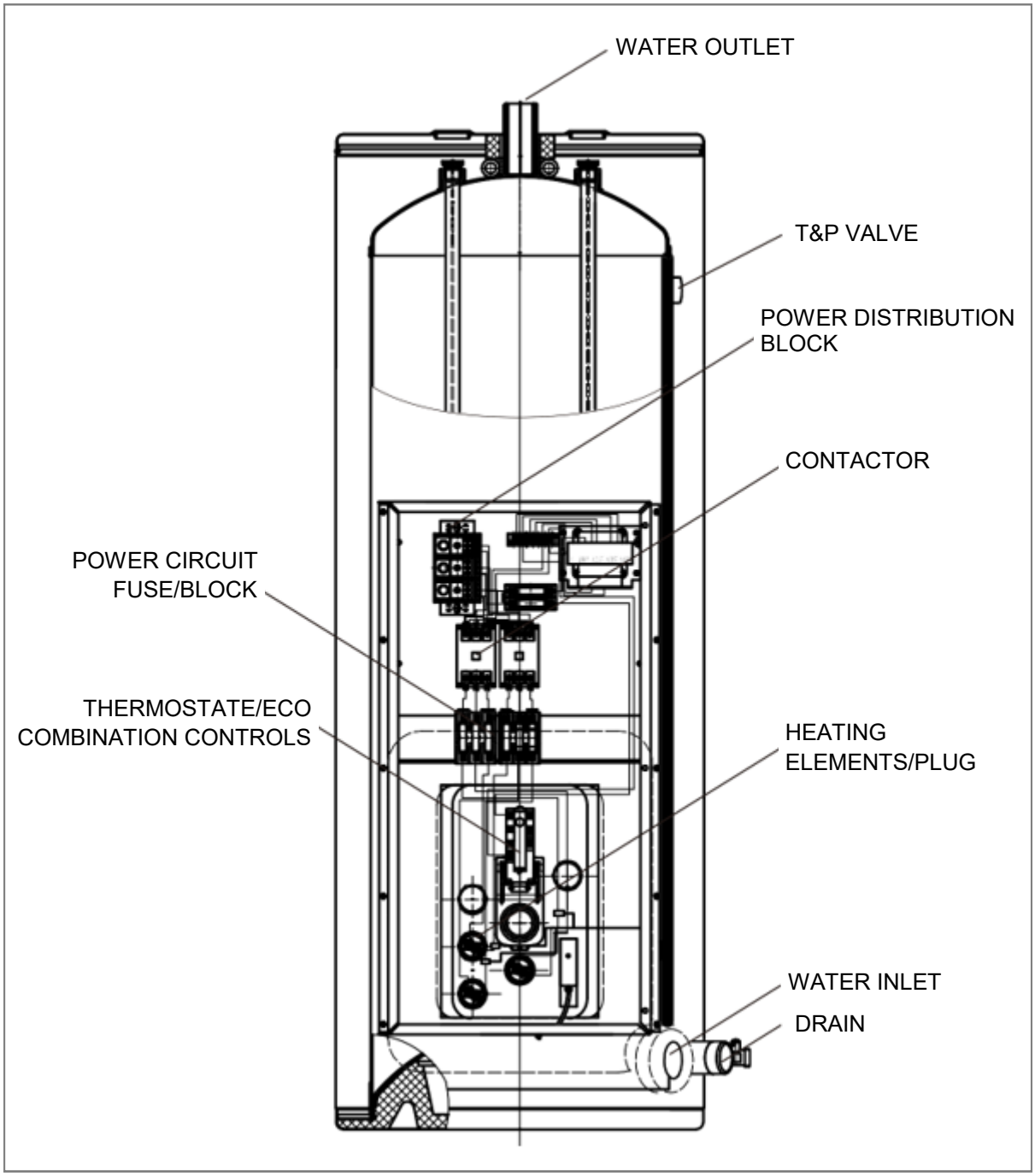


Figure 3: Components

3.3 Specifications

Table 2A: Technical Specifications

Model		RCET5012	RCET5018	RCET8012	RCET8018
Maximum Electrical Consumption kW/hr		12.3	18	12.3	18
Tank Volume		50 Gallons (189 Liters)		80 Gallons (303 Liters)	
First Hour Delivery at 100°F Rise [1]		85	109	106	130
Product Weight		197 lb (89 kg)	203 lb (92 kg)	246 lb (112 kg)	252 lb (114 kg)
Installation Type		Internal (Indoor) Commercial Applications			
Water Supply Pressure		150 PSI (Maximum)			
Temperature Setting		100°F (38°C) to 170°F (77°C)			
Electrical Data	Normal	12.3 kW	18 kW	12.3 kW	18 kW
	Max Current	51.25 A	75 A	51.25 A	75 A
	Fuse	Element Leg Fuse: 30 Amps (Per Leg)			
Connections		Hot Water Outlet: 1-1/2 in. MNPT Cold Water Inlet: 1-1/2 in. MNPT			
Electric Connections		Appliance: AC 208/240 Volts, 60Hz, Single Phase. Can be converted to 3-phase. Integrated Temperature Controller: AC 240 Volts (Analog)			
Water Temperature Control		Surface Mounted Thermostat			
ENERGY STAR® Certified		Yes			
Efficiency		Water heater models listed above meet or surpass thermal efficiency and standby loss requirements set by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards, as part of the Energy Policy Act (Epact), a federal law that mandates energy efficiency for various appliances.			
Certifications		UL 1453			
Safety Devices		• Hi-Limit Reset Therm-O-Disc 66T 4401 301202 • T&P Relief Valve: ANSI Z21.22 and ASME approved, 105,000 BTU/HR, 150 PSI, 210°F (99°C).			

[1] First Hour Delivery Rating is a theoretical calculation based on 70% usable tank capacity (Tank Capacity x 0.70 + (recovery) = First Hour Delivery Rating)

Table 2B: Electrical Consumption and Tank Capacity

kW Input	Model Numbers Tank Capacity in Gallons		Number of Elements	Element Wattage	Full Load Current in Amperes			
					Single Phase		Three Phase	
	50	80			208V	240V	208V	240V
12.3	RCET5012	RCET8012	3	4,100	59	51	34	30
18	RCET5018	RCET8018	6	3,000	86.5	75	50	43.3

Table 3: Recovery Capacities

RECOVERY CAPACITIES													
U.S. Gallons/Hour Liters/Hour at Temperature Rise Indicated													
Input (kW)	Equivalent BTU/HR	Units	40°F (22°C)	50°F (28°C)	60°F (33°C)	70°F (39°C)	80°F (45°C)	90°F (50°C)	100°F (56°C)	110°F (61°C)	120°F (67°C)	130°F (72°C)	140°F (78°C)
12.3	40,946	GPH	124	99	83	71	62	55	50	45	41	38	35
		LPH	470	376	313	268	235	209	188	171	157	145	134
18	61,420	GPH	186	149	124	106	93	83	74	68	62	57	53
		LPH	705	564	470	403	352	313	282	256	235	217	201

3.4 Dimensions

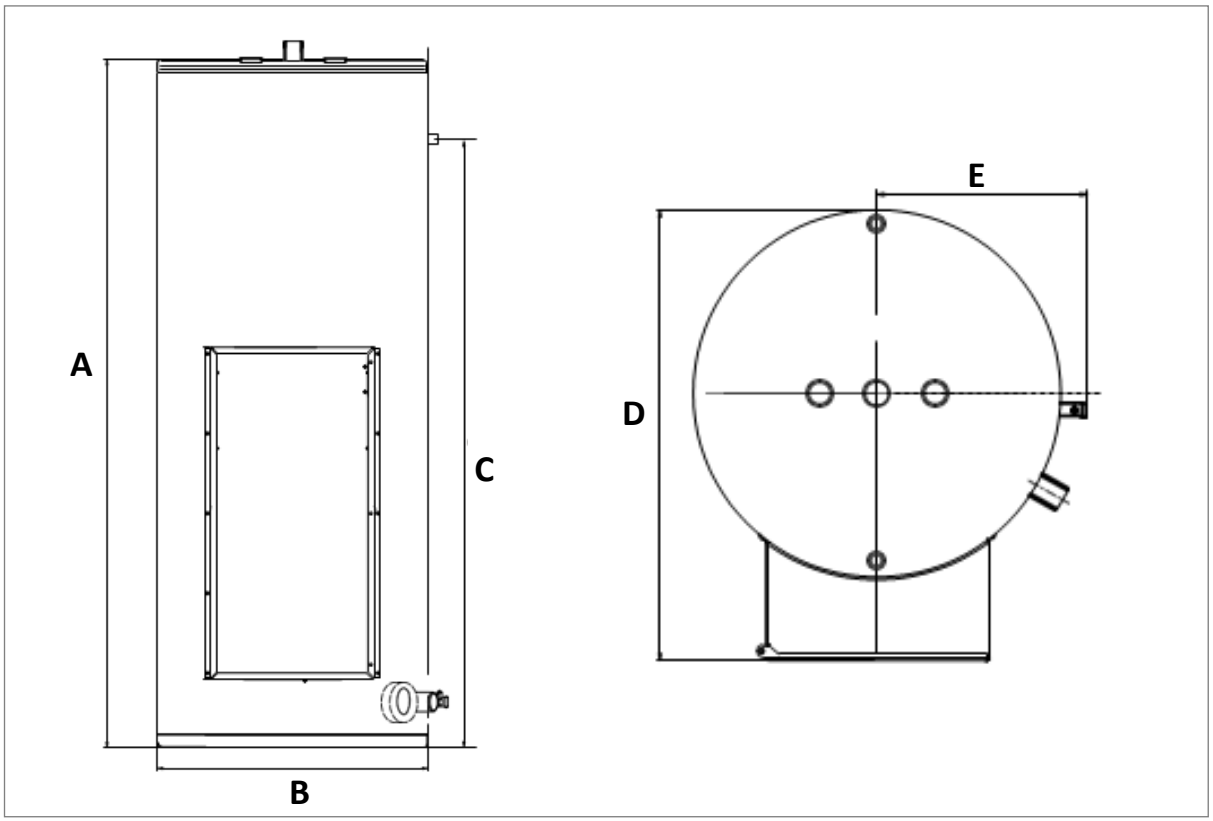


Figure 4: Dimensions

Table 4: Dimensions

Measurements: in. (mm)

Model	A Tank Height	B Tank Diameter	C PRV Height	D Maximum Depth	E
CET5012/5018	58.1 (1476)	21.5 (546)	49 (1245)	27.25 (692)	16.5 (419)
CET8012/8018	64.25 (1632)	25.28 (642)	53.07 (1348)	31.02 (788)	18.4 (467)

4. Install the Water Heater

THIS SECTION IS INTENDED FOR THE INSTALLER

- It is recommended that a trained and qualified professional who has attended a Rinnai training class complete the installation. The warranty may be voided due to any improper installation. Training on Rinnai products is accessible at rinnaipro.myabsorb.com.
- A trained and qualified professional should have skills such as:
  - Connecting water lines, valves, and electricity
  - Knowledge of applicable national, state, and local codes

4.1 Installation Guidelines

When installing the water heater, follow these guidelines:

- This water heater is certified for installation in commercial applications.
- This water heater is suitable for combination water heating and space heating and not suitable for space heating applications only.
- The installation must conform with local codes, or in the absence of local codes, with the National Electrical Code, NFPA 70 or the Canadian Electrical Code CSA C22.1. To comply with NSF Standard 5, the bottom of the water heater must be sealed to the floor with silicone-based sealant or elevated 6 in. (152 mm) above the floor.
- The appliance, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code, ANSI/NFPA 70, and/or the CSA C22.1, Canadian Electrical Code, Part 1.
- If a water heater is installed in a closed water supply system, such as one having a backflow preventer in the cold water supply line, means shall be provided to control thermal expansion. Contact the water supplier or local plumbing inspector on how to control thermal expansion.
- This water heater should not be connected to any heating system(s) or component(s) used with non-potable water heating appliance. Toxic chemicals, such as those used for boiler treatment should not be introduced into this system.
- Field installed circulating pumps should be of all bronze construction.
- Insulation blankets are available to the general public for external use on the electric water heaters, but they are not required. The purpose of the insulation would be to decrease the amount of standby loss. This water heater meets or exceeds ASHRAE standards with respect to standby loss. Should an insulation blanket be installed with this water heater, do not cover the temperature and pressure relief valve. Do not cover the instruction manual. Do install replacement labels on the outside of the blanket where they can be accessed.

⚠ WARNING

- Temperature-Pressure (T&P) relief valve must comply with ANSI Z21.22 and ASME code.
- Properly sized T&P valve must be installed in opening provided.
- Failure to install T&P valve can result in overheating and over pressurization of the tank.
- Failure to follow these instructions can result in serious injury or death.

DO NOT

- DO NOT install the water heater in an area where water leakage of the unit or connections will result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the water heater.
- DO NOT use chemically treated water (i.e. chlorinated water or salt water for pools or spas) in the appliance.
- DO NOT use substitute parts that are not authorized for this appliance.

4.2 What You Will Need

4.2.1 Items Included

Unpack the Rinnai water heater package and verify the following contents are included. If any items are missing, contact your local dealer/ distributor or call Rinnai Customer Care at 1-800 -621-9419.

- Rinnai commercial electric water heater
- Literature Bag
  - Commercial Electric Water Heater Installation and Operation Manual (this manual)
  - Model/Serial Number Labels (with printed QR code)

4.2.2 Items Needed (Field-Supplied)

- Pipe Wrenches (x2)
- Phillips Head Screwdriver
- Wire Cutters
- Gloves
- Safety Glasses
- Level
- Teflon Tape (recommended) or Pipe Compound
- Pipe Insulation
- Torch Set
- Copper Tubing Cutter
- Steel Pipe Cutter
- Heat Tape
- Electrical Wire
- Isolation Valves
- Unions and Drain Valves

4.3 Choose an Installation Location

When selecting an installation location, you must ensure that all water heater clearances will be met. Consider the installation environment and water quality. Requirements for the water lines and electrical connections can be found in their respective installation sections in this manual.

4.3.1 Water Quality Guidelines

This section provides information on the importance of water quality to the water heater. The information is intended to serve as a general guide only and is not a complete list of water quality guidelines. Consideration of care for your water heater should include evaluation of water quality. The water must be potable, free of corrosive chemicals, sand, dirt, or other contaminants. It is up to the trained and qualified professional to ensure the water does not contain corrosive chemicals or elements that can affect or damage the water heater. Water that contains chemicals exceeding the levels listed below can damage the water heater. Replacement of components due to water quality damage is not covered by the warranty.

If you install this water heater in an area that is known to have hard water or that causes scale build-up, the water must be treated and may require a more frequent flushing schedule.

Table 5: Water Quality Guidelines

Contaminant	Maximum Level
Total Hardness	Up to 200 mg/L
Aluminum *	Up to 0.2 mg/L
Chlorides *	Up to 250 mg/L
Copper *	Up to 1.0 mg/L
Dissolved Carbon Dioxide (CO2)	Up to 15.0 mg/L
Iron *	Up to 0.3 mg/L
Manganese *	Up to 0.05 mg/L
pH *	6.5 to 8.5
TDS (Total Dissolved Solids) *	Up to 500 mg/L
Zinc *	Up to 5 mg/L

*Source: Part 143 National Secondary Drinking Water Regulation

4.3.2 Location Considerations

- Install on a level surface. Shim the base as necessary if leveling is required.
- Install near a floor drain. The heater should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the heater or to the lower floors of the structure.
- Install as closely as possible to the major points of hot water usage.
- Hot water piping should be as short as possible and it should be insulated to prevent heat loss.
- The ambient temperature where the water heater is installed must be between 32°-122°F (0-50°C).
- In coastal regions, the water heater should be installed so that it is sheltered/ protected from exposure to sea breeze. Exposure to salty spray or breeze can cause corrosion of the water heater.
- Damage and repair due to corrosive compounds in the air is not covered by warranty.

4.3.3 Clearances

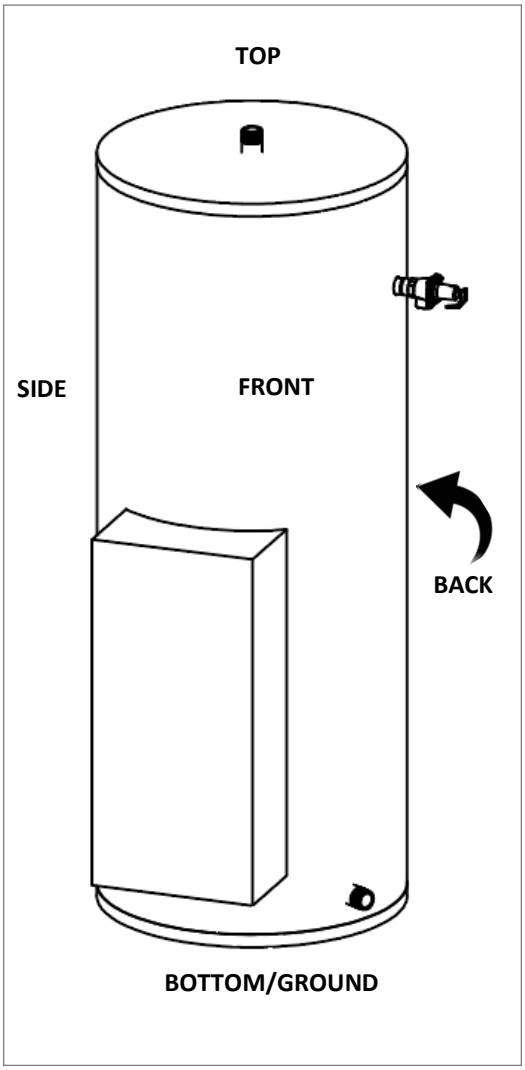


Figure 5: Clearances

Table 6: Clearances

Location	Clearance to Combustibles and Non-Combustibles
Top	12 in. (305 mm)
Bottom/Ground	0 in.
Front	0 in. *Clearance for servicing is 24 in. (610 mm) in front of water heater.*
Back	0 in.
Sides *(Left and Right)*	0 in.

4.3.4 Installation Location Checklist

Use this checklist to ensure you have selected the correct location for the water heater.

☐	The water heater is installed on a flat surface.
☐	The water heater location complies with the required clearances.
☐	The water heater is installed near a floor drain or has a method of draining.
☐	The ambient room temperature is between 32°-122° F (0-50 C°).
☐	A standard 240 VAC, 60 Hz properly grounded electrical source is available.
☐	The installation must conform with local codes or, in the absence of local codes, with the National Electrical Code, NFPA 70 or the Canadian Electrical Code.

4.4 Connect the Water Supply

4.4.1 Guidelines

- The piping (including soldering materials) and components connected to this appliance must be approved for use in potable water systems.
- Purge the water line to remove all debris and air. Debris will damage the water heater.
- The appliance must not be connected to a system that was previously used with a non-potable water heating appliance.
- DO NOT introduce toxic chemicals such as those used for boiler water treatment to the potable water used for space heating.

4.4.2 Instructions

To connect the water supply, follow the instructions below.

IMPORTANT

Water connections to the water heater should follow all state and local plumbing codes. If this is a standard installation, refer to the “Piping Diagram for Basic Installation” below.

1. Plumb the cold water supply line to the water heater on the 1-1/4 in. MNPT connection at the bottom of the water heater.
2. Plumb the hot water supply line to the 1-1/4 in. MNPT connection.
3. Install a thermal expansion tank on the cold supply to control expansion as water is heated in a closed system.

PIPING DIAGRAM FOR BASIC INSTALLATION

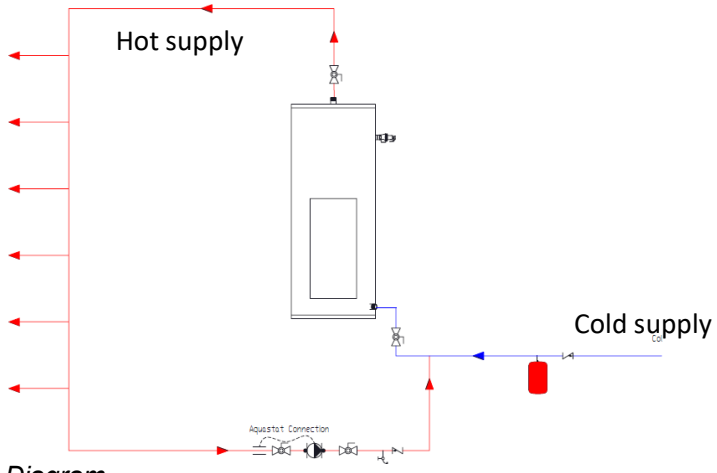


Figure 6: Piping Diagram

KEY	
Ball Valve	Drain Valve
T&P Valve	Expansion Tank
Check Valve	Circulating Pump

This is not an engineered drawing. It is intended only as a guide and not as a replacement for professionally engineered project drawings. This drawing is not intended to describe a complete system. It is up to the contractor/engineer to determine the necessary components and configuration of the particular system being installed. This drawing does not imply compliance with local building code requirements. It is the responsibility of the contractor/engineer to ensure installation is in accordance with all local building codes. Confer with local building officials before installation.

4.5 Install the Pressure Relief Valve

⚠ WARNING Water discharged from the pressure relief valve could cause severe burns instantly or death from scalds.

4.5.1 Guidelines

- This water heater is provided with a properly rated/sized and certified combination temperature - pressure relief valve by the manufacturer. The valve is certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment of materials as meeting the requirements for Relief Valves for Hot Water Supply Systems, ANSI Z21.22, CSA 4.4, and the code requirements of ASME.

- If replaced, the new valve must meet the requirements of local codes, but not less than a combination temperature and pressure relief valve rated/sized and certified as indicated in the above paragraph. The new valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater (150 psi = 1,035 kPa) and a discharge capacity not less than the water heater Btu/hr or kW input rate as shown on the water heater's model rating plate.

- The pressure relief valve must be manually operated once a year to check for correct operation.

- The discharge line from the temperature and pressure relief valve should pitch downward and terminate 6 in. (152 mm) above drains where discharge will be clearly visible.

- The discharge end of the line shall be plain (unthreaded) and a minimum of 3/4 in. nominal pipe diameter. The discharge line material must be suitable for water at least 180°F (82°C).

- The pressure relief valve must be installed near the hot water outlet.

- DO NOT place any other valve or shut off device between the pressure relief valve and the water heater.

- If a pressure relief valve discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the pressure relief valve.

- Protect the temperature and pressure relief valve and relief valve discharge line from freezing. Do not plug or restrict flow of the pressure relief valve.

- DO NOT plumb the pressure relief valve with any other drain; it must be plumbed independently to drain.

- DO NOT plug the pressure relief valve and do not install any reducing fittings or other restrictions in the relief line. The pressure relief line should allow for complete drainage of the valve and the line.

Pressure Relief Valve Maintenance:

For proper care of this approved temperature and pressure relief valve, it is recommended that the valve is manually operated once a year. In doing so, it will be necessary to take precautions with regard to the discharge of potentially scalding hot water under pressure. Ensure discharge water has a safe place to flow. Contact with your body or other property may cause damage or harm.

4.6 Connect the Power Supply

⚠ WARNING

- Before removing any access panels or servicing the water heaters make sure the electrical supply to the water heater is turned off. Failure to do so could result in death or serious bodily injury.
- The installation must conform to local code authority, and in the absence of local codes, the installation must comply with NEC, NFPA 70 or the Canadian Electrical Code.
- The water heater must be electrically grounded in accordance with local codes and ordinances or, in the absence of local codes, in accordance with the National Electrical Code, ANSI/ NFPA No. 70.
- Voltage applied to the heater should not vary more than 5% to –10% of the model and rating plate marking for operation.
- DO NOT turn on electrical supply before filling the water heater with water.

4.6.1 Guidelines

Tables 7 and 8 below provide the total connected heating element load in amperes for branch circuit conductor and over-current protection sizing. Single-phase heaters are two wire circuits. Three-phase heaters are three wire circuits. In addition to the foregoing, a grounded conductor is required.

The rating of the over-current protection must be computed on the basis of 125% of the total connected load amperage. Where the standard ratings and settings do not correspond with this computation, the next higher standard rating or setting should be selected.

Table 7: Overcurrent Protection

kW	PHASE	RECOMMENDED OVER CURRENT PROTECTION RATING	240			
		VOLTAGE	COPPER		ALUMINUM	
		240	WIRE GAUGE	EMT CONDUIT	WIRE GAUGE	EMT CONDUIT
12.3	1	65	6	3/4	4	1
	3	40	8	3/4	8	3/4
18	1	95	3	1	1	1 1/4
	3	55	6	1	4	1 1/4

Table 8: Total Connected Heating Element Load

ELECTRICAL CHARACTERISTICS							
INPUT kW	NO.OF ELEMENTS	ELEMENTS WATTAGE	FULL LOAD CURRENT IN AMPERES		SURFACE MOUNTED		
			240V PHASE		NO.OF T'STATS	NUMBER OF FUSES	NUMBER OF CONTACTORS
			1	3			
12.3	3	4,100	50	29	1	6	2
18	6	3,000	75	43.3	1	12	4

4.6.2 Wiring Diagrams

The following describes the heater circuits and includes wiring diagrams. All heater circuits are designed for 60/50 hertz alternating current. The water heater circuit wiring is 12 AWG, AWM, or TEW type, rated 240 volts, 220˚F. Fusing consists of two 30 amp fuses for each element. Fusing is an optional feature for Canadian models.

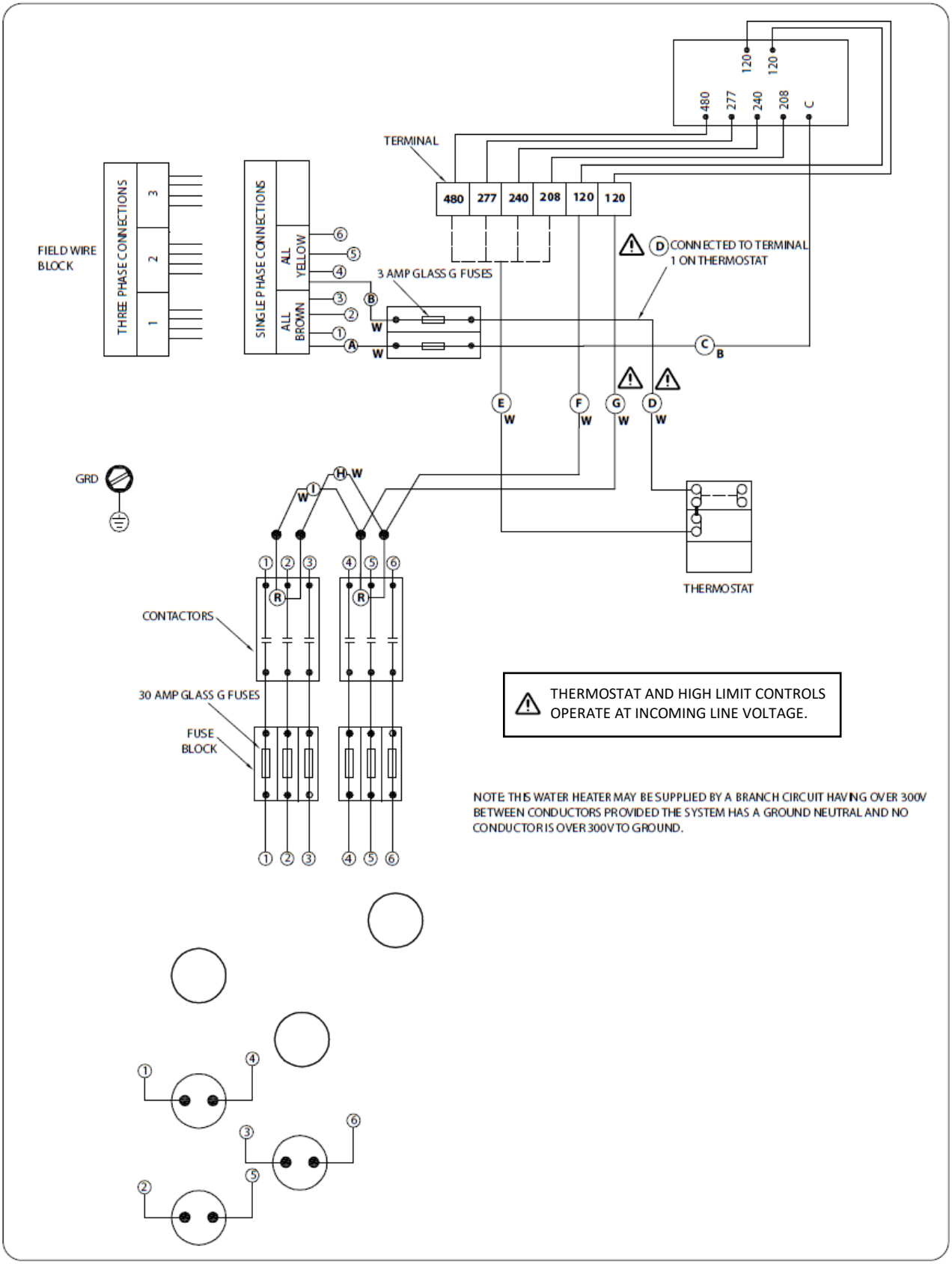


Figure 7: Three Element Single and Three Phase Power Circuits

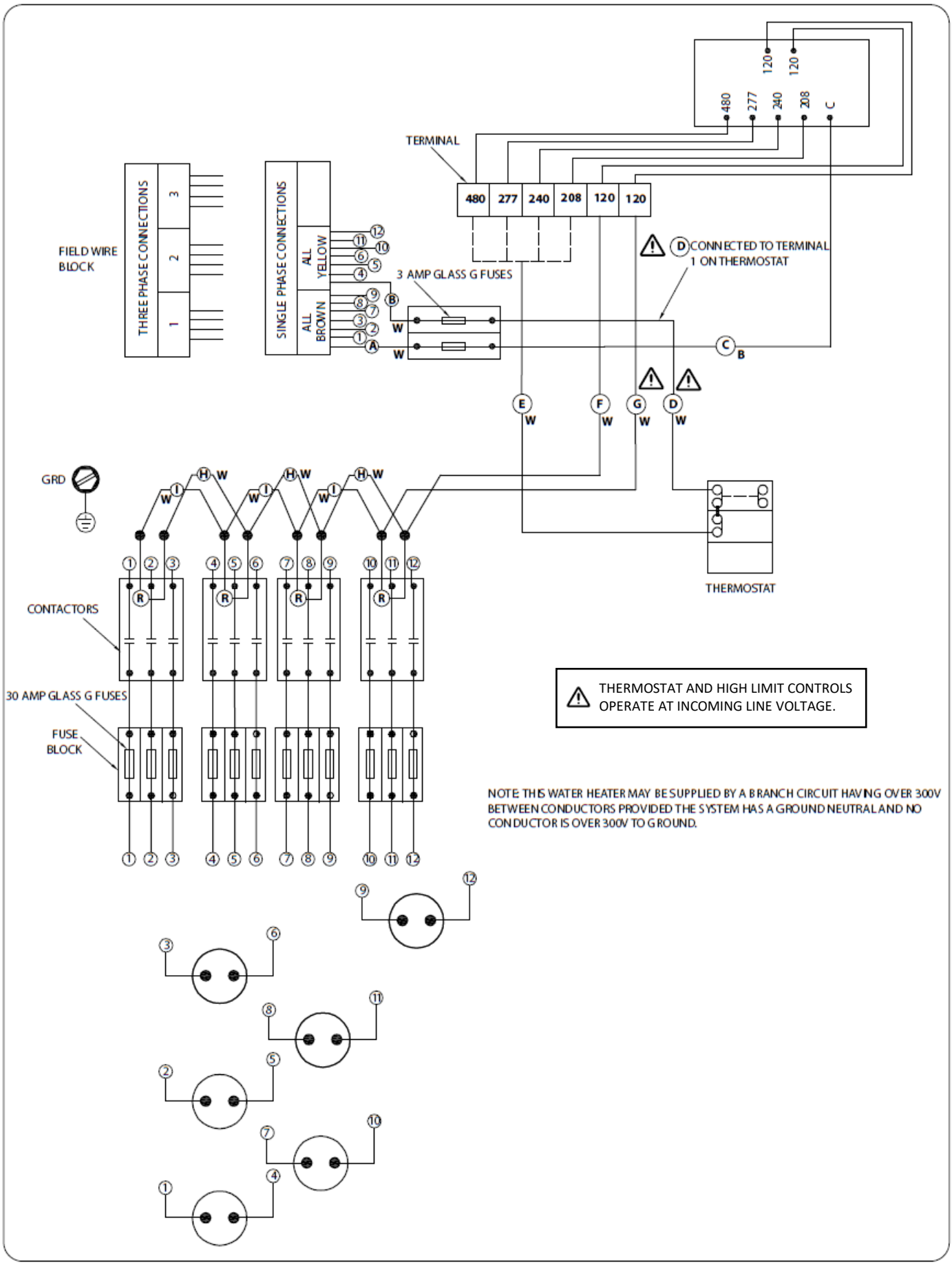


Figure 8: Six Element Single and Three Phase Power Circuits

4.6.3 Electrical Connections and Wiring

- Check the rating plate of the water heater against the electrical supply for correct voltage.
- The water heater is internally wired from the factory to the field connection terminal block for a single phase connection. For three phase connections refer to the wiring diagrams in this manual and:
    1. Disconnect the yellow and brown wires from the field terminal block legs 1 and 2.
    2. Reconnect yellow and brown wires to legs 1, 2 and 3 of the field terminal block.
    3. Ensure that the yellow and brown wires from each element are not on the same leg of the terminal block. If both yellow and brown wires from the same element(s) are on the same leg, this will not supply the correct power and the element(s) will not work correctly.
    4. Connect incoming power to field terminal block legs 1, 2 and 3.
- Provide a separate branch circuit with overcurrent protective device and suitable disconnection means for each water heater. Refer to Table 7 for minimum branch circuit sizing.

4.6.4 Grounding

- Non-metallic plumbing, dielectric unions, and other materials can cause the water heater to be electrically isolated, and the branch circuit should include one of the following means for grounding.
- Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.
- Non-metallic sheathed cable, or metallic conductor or metallic sheathed cable not approved for use as a grounding conduction, shall include a separate conductor for grounding. It shall be connected to the grounding means of the water heater (1/4in green screw) and that of the electrical distribution box. Terminate stranded grounding conductions with suitable pressure connectors.

4.7 Post-Water Heater Installation Checklist

Complete the following checklist when water heater installation is complete. You should be able to answer YES to each question. If you answer NO to any question, installation is not complete. Refer to the applicable section in the Rinnai Water Heater Installation and Operation Manual for additional information.

INSTALLATION LOCATION	YES	NO
Is the water heater on a flat surface?	☐	☐
Does the water heater comply with required clearances?	☐	☐
Does the water have means for draining?	☐	☐
Is the ambient temperature between 32˚F and 122˚F?	☐	☐
PLUMBING	**YES**	**NO**
Have the water lines been purged of all debris?	☐	☐
Have you verified the hot and cold water lines to the water heater are not interchanged?	☐	☐
Does the water supply to the heater have adequate pressure? Is it free of chemicals? Did you verify it does not exceed total hardness that will damage the heat exchanger?	☐	☐
Have you verified that no toxic chemicals were introduced to the potable water?	☐	☐
Have water quality issues (if any) been addressed?	☐	☐
Have you performed the leak and pressure test for the water heater and plumbing system?	☐	☐
TEMPERATURE AND PRESSURE RELIEF VALVE (T&P)	**YES**	**NO**
Does the T&P valve comply with the standard for Relief Valves for Hot Water Supply Systems, ANSI Z21.22, CSA 4.4, and the code requirements of ASME?	☐	☐
Did you verify the T&P is rated up to 150 psi and (at least) the maximum input of the water heater?	☐	☐
Is the discharge from the T&P piped to the ground or into a drain system as per local codes?	☐	☐
Is the discharge line from the T&P pitched downward and does it terminate 6 in. (152 mm) above the drains?	☐	☐
Is the discharge end of the line plain (unthreaded) and a minimum of 3/4 in. diameter?	☐	☐
Is the discharge line material suitable for at least 180°F (82°C) water?	☐	☐
Did you take measures to protect the T&P and T&P discharge line from freezing?	☐	☐
Have you verified the T&P **is not** plumbed with any other drain lines?	☐	☐
Have you verified the T&P **is not** plugged and that reducing fittings, valves, or other restrictions are not installed in the relief line?	☐	☐
ELECTRICAL SUPPLY	**YES**	**NO**
Confirm the electricity is supplied from a 240VAC or 208VAC, 60Hz power source.	☐	☐
Confirm the installation conforms to local code authority, and in the absence of local codes, the NEC, NFPA 70, or the Canadian Electrical Code.	☐	☐
Have you checked to make sure that the voltage is not varying more than 5% to –10% of the model and rating plate?	☐	☐
Have you properly grounded the circuit?	☐	☐
Is the gauge wire and conduit sized properly for the number per table 7?	☐	☐
If the electrical supply is single-phase, did you follow the wiring steps in the manual?	☐	☐

5. Operation

5.1 Safety Precautions

Never turn on power to the water heater without being certain the water heater is filled with water and a temperature and pressure relief valve is installed in the relief valve opening.

⚠ WARNING

Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned “OFF.”

Failure to do so could result in death, serious injury, or property damage.

⚠ DANGER

Full power is present whenever the cabinet door is opened, even with the pilot switch turned off.

⚠ CAUTION

Fill tank with water before operating or supplying power in order to prevent property damage.

- Do not use this appliance if any part has been under water. Immediately call a trained and qualified professional to inspect the appliance and to replace any part of the system which has been under water.
- DO NOT use an extension cord or an adapter plug with this appliance.
- DO NOT turn on water heater unless it is filled with water.
- DO NOT turn on water heater if cold water supply shut-off valve is closed.
- Hydrogen gas can be produced in a hot water system served by this water heater that has not been used for a long period of time.

⚠ CAUTION

Hydrogen gas is extremely flammable. To reduce risk of injury, hot water fixtures must be opened for several minutes before using any electrical appliance connected to the hot water supply. Do not smoke or present an open flame near the faucet at the time of opening.

- Any alteration to the appliance or its controls can be dangerous and will void the warranty.
- If you install this water heater in an area that is known to have hard water or that causes scale build-up the water must be treated and/ or the heat exchanger flushed regularly. Rinnai provides a “Scale Control System” that offers superior lime scale prevention and corrosion control by feeding a blend of control compounds into the water supply. Damage and repair due to corrosive compounds in the air is not covered by warranty.
- Always check the water temperature before entering a shower or bath.

5.2 Filling the Water Heater

1. The electrical disconnect switch should be off, or the building electrical supply should be turned off.
2. Close the water heater drain valve.
3. Open a nearby hot water fixture to allow for the water pressure to purge air from the system.
4. Open the cold water inlet shut-off valve to allow water to fill the water heater and plumbing.
5. Close the hot water fixture from step 3 once water is flowing freely without any air purging.
6. The heater is now full of water.

5.3 Setting the Temperature

Make sure the tank is filled with water before placing the water heater in operation. To comply with safety regulations and reduce the risk of injury, the thermostat of the water heater has been set to a factory setting of 120˚F. This is the preferred starting point for setting the control for general purpose hot water. To meet commercial water needs, the thermostat is adjustable to 170˚F.

⚠ DANGER

Water temperatures over 125°F (52°C) can cause severe burns or scalding resulting in death.

Hot water can cause first degree burns with exposure for as little as:

- 3 seconds at 140°F (60°C)
- 20 seconds at 130°F (54°C)
- 8 minutes at 120°F (49°C)

Children, disabled, or elderly are at highest risk of being scalded.

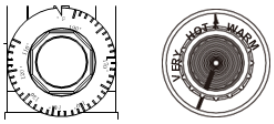
Feel water before bathing or showering.

➡ IMPORTANT

Check local codes for the maximum water temperature setting allowed when used in nursing homes, schools, day care centers, and all other public applications.

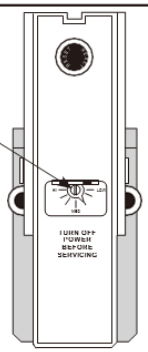
⚠ DANGER The power to the heater must be disconnected before adjusting the temperature setting of the thermostat.

To adjust the water temperature on Surface Mounted Thermostat models, insert a small straight screwdriver into slotted screw of indicator and move indicator to desired setting.



E-10 Model Only

Immersion Thermostat



Surface Mounted Thermostat

To adjust the water temperature on Immersion Thermostat models, turn thermostat dial to align desired mark with index line above thermostat. See “Operation” section of this manual for details.

CAUTION!! Hotter water increases the risk of SCALDING!

Figure 9

- There is one thermostat that controls all heating elements. It is located behind the removable pad of glass fiber insulation in the control compartment.
- Adjust thermostat dial pointer with a small screwdriver to the desired water temperature setting (Figure 9). THERMOSTAT PROTECTIVE COVER SHOULD NOT BE REMOVED. The thermostat is adjustable from a “LOW” to “HI” setting. An approximate water temperature of 150°F (66°C) is accomplished when the temperature dial pointer is in the “MED” position. Each mark above and below the “MED” position indicates an approximate 10°F (6°C) change in water temperature. Replace insulation, close access door and turn power ”ON”, and the water heater is operational.
- NOTE: A thermometer installed at or near the outlet of the water heater and/or storage tank will result in the most accurate outlet water temperature settings.
- HIGH TEMPERATURE LIMIT CONTROL — The water heater is equipped with a manual reset high temperature limiting control(s). If for any reason the water temperature becomes excessively high, The High Temperature Limit Control breaks the power to the heating elements. Once this control opens, it must be manually reset.

⚠ CAUTION The cause of a high limit temperature condition must be investigated by a qualified service personnel and corrective action taken before placing the water heater in service again.

5.4 Resetting High Temperature Control

⚠ WARNING The power must be disconnected to the water heater before attempting to reset the limit control.

- Allow the water in the tank to cool before attempting to reset the high temperature limit control.
- Press the red “RESET” button located above the thermostat. The thermostat protective cover SHOULD NOT be removed.

5.5 Troubleshooting

⚠ WARNING Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned “OFF.” Failure to do so could result in death, serious injury, or property damage.

Not Enough or No Hot Water
• Be certain the electrical disconnect switch serving the water heater is in the on position. • Check the fuses in the electrical disconnect switch and on the heater. • If the water was too hot, and now it is cold, the high limit switch may have been activated. See the temperature section of this manual for how to reset the high limit controls. • There may have been too large of a demand for the tank recovery to keep up. • Cooler incoming water temperature will lengthen the time required to heat water to the desired temperature. • Look for a hot water leak. • Scale or sediment build up may be affecting the function of the water heater.
Abnormal Sounds
• Sediment or lime scale build up on the elements causes sizzling and hissing noises when the heater is in operation. The tank and element should be cleaned. See the maintenance portion of the installation and operation manual. • Contactors or switches may make clicking noises during normal operation which is normal. Transformers may also produce a normal humming noise.
Water Leak
• Ensure the water heater drain valve is closed completely. • If the T&P valve is leaking there could be excessive water temperature, excessive water pressure, or a faulty relief valve. • Excessive water pressure is the most common cause of a T&P valve leak. Check the expansion tank to ensure that it is pressurized and working properly.

6. Maintenance

6.1 Maintenance

This water heater must be inspected annually by a trained and qualified professional. Repairs and maintenance shall be performed by a trained and qualified professional. The trained and qualified professional must verify proper operation after servicing.

⚠ WARNING

To protect yourself from harm, before performing maintenance:

- Before removing any access panels or servicing the water heater, make sure the electrical supply to the water heater is turned “OFF”
- Turn off the incoming water supply. This can be done at the isolation valve on the cold water supply of the water heater or by turning off the water supply to the building.

The following maintenance items are required for the proper operation of your water heater.

ANODE ROD

Each water heater contains at least one anode rod, which will slowly deteriorate due to electrolysis. The anode rod is a sacrificial component which prolongs the life of the water heater by protecting the glass lined tank from corrosion. Higher setpoint temperatures and water softening methods can increase the rate of the anode rod deterioration. The anode rod should be inspected once every 3 years, and replaced when needed by following the below steps.

1. Turn off electric supply to the water heater.
2. Shut off the water supply and open a nearby hot water fixture in order to depressurize the tank.
3. Drain 5 gallons of water by using the drain valve on the bottom of the tank, then close the drain valve.
4. Remove the anode rod.
5. Inspect the anode rod. If a majority of the rods diameter is less than 3/8in diameter, or if the support wire is visible for a major length of the rod, then it will need to be replaced.
6. Use Teflon tape or pipe sealant on the threads and install a new anode rod.
7. Turn on the cold water supply and open a nearby hot water fixture in order to purge air from the water system. Check for any leaks around the newly installed anode rod.
8. Turn on the power supply to the water heater.

LIME/SCALE BUILD-UP

Scale build-up is caused by hard water and can be accelerated if the water heater is set at a high temperature. Refer to section “6.2 Flushing the Water Heater” for more information. Refer to section “4.3.1 Water Quality Guidelines” to determine if your water needs to be treated or conditioned.

The water must be potable, free of corrosive chemicals, sand, dirt, or other contaminates. It is up to the installer to ensure the water does not contain corrosive chemicals or elements that can affect or damage the elements or water heater.

Water that contains chemicals exceeding acceptable levels, may damage the water heater. Replacement of the water heater or components due to water quality damage is not covered by the warranty.

Lime scale accumulation may cause noise to occur during operation. It is recommended that the heating elements be removed periodically for examination. If it is scaled, all of the elements should be removed and cleaned. If the tank bottom has an accumulation of sediment, it should be cleaned and flushed.

To remove lime scale, follow the below steps:

1. Turn off electrical disconnect switch or building power supply.
2. Drain the water heater following the draining instructions.
3. Open the front panel.
4. Disconnect the element wiring.
5. Unscrew each element and remove the elements and gaskets from the openings.
6. Place the limed ends of the heating elements into a delimer and allow scale to dissolve. Do not permit delimer or water to contact the electrical terminals.
7. Once the scale is removed, flush the cleaned elements with water.
8. Remove sediment and scale from the tank bottom through the element openings and drain valve opening.
9. Put new gaskets on each element and install into tank openings.
10. Attach element wires to connection points from which they were removed.
11. Fill the water heater and check for leaks.
12. Close the front panel.
13. Restore power.

TEMPERATURE & PRESSURE RELIEF VALVE

Operate the pressure relief valve manually once a year. In doing so, it will be necessary to take precautions with regard to the discharge of potentially scalding hot water under pressure. Ensure discharge has a safe place to flow. Contact with your body or other property may cause damage or harm.

⚠ WARNING

Testing the pressure relief valve should only be performed by a trained and qualified professional. Water discharged from the pressure relief valve could cause severe burns instantly or death from scalds.

6.2 Flushing the Water Heater

1. Turn off the electrical supply to the water heater at the breaker or at the disconnect switch.
2. Ensure the cold water supply valve is open.
3. Open a hot water fixture or fixtures to let the water run until it is no longer hot, then close the hot water fixtures.
4. Connect a hose to the drain valve at the bottom of the water heater, and terminate it outside or into an adequate drain. Make sure the hose is tightened and secured to the drain valve.
5. Open the drain valve to flush the storage tank and remove sediment.
6. Once the water runs clean, close the drain valve, and remove the drain hose.
7. Fill the water heater by opening a hot water fixture to purge the air from the system. Once the water is flowing without air, turn off the hot water fixture.
8. Turn on the electrical supply to the water heater.

6.3 Draining the Water Heater

⚠ CAUTION

The power to the water heater must be disconnected before draining the water heater.

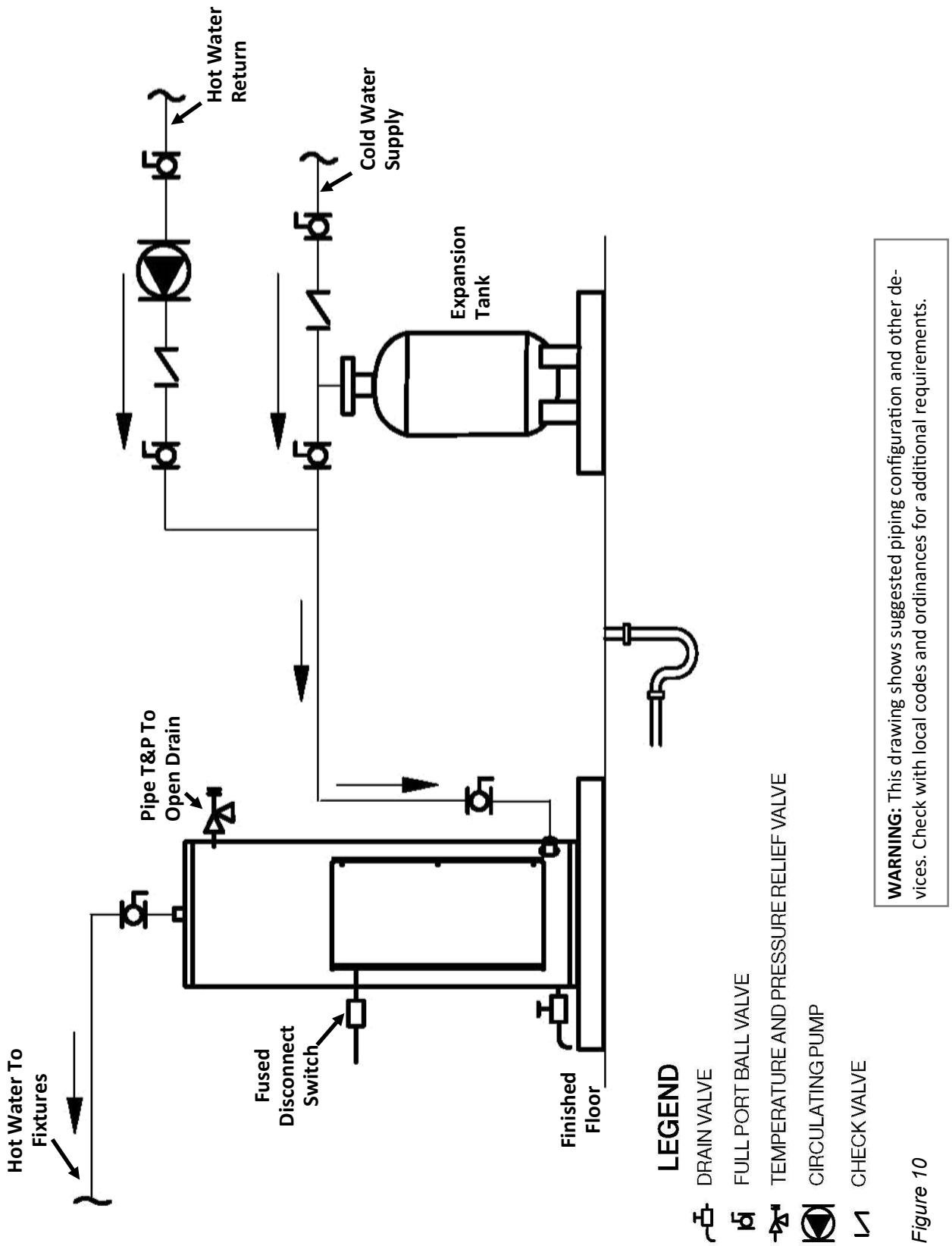
⚠ WARNING

Water discharged from draining the tank could cause severe burns instantly or death from scalds.

1. Turn off the electrical supply to the water heater at the breaker or at the disconnect switch.
2. Open and continue running a hot water fixture until the tank temperature drops to a safe temperature.
3. With the hot fixture open and electric supply off, close the cold water supply.
4. Attach a hose to the drain valve at the bottom of the heater.
5. Run the drain hose outside or to an adequate drain.
6. Open the drain valve and allow the water to drain until it is no longer flowing out of the tank.

7. Plumbing Diagrams

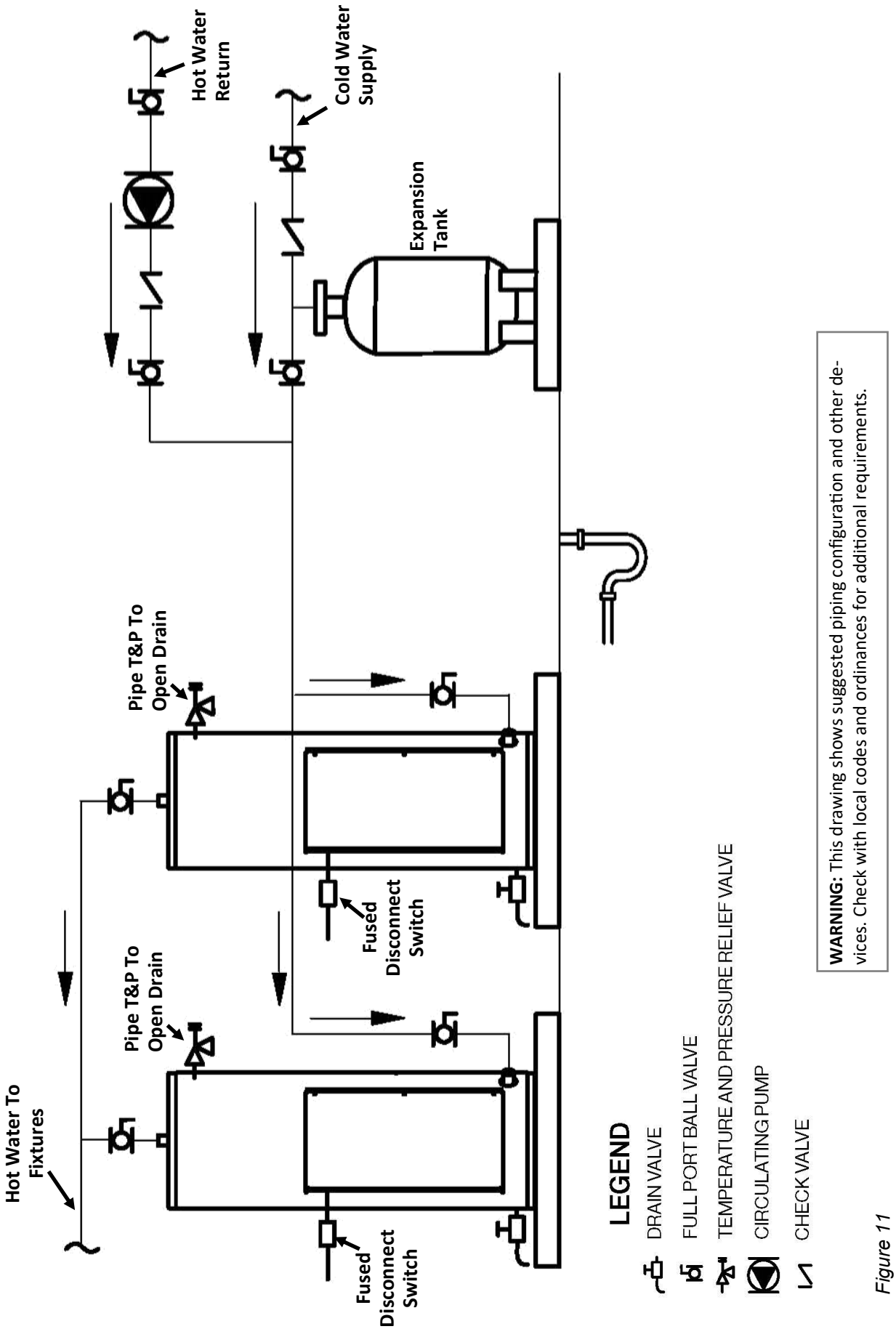
Commercial Electric Water Heater: 1 Unit



WARNING: This drawing shows suggested piping configuration and other devices. Check with local codes and ordinances for additional requirements.

Figure 10

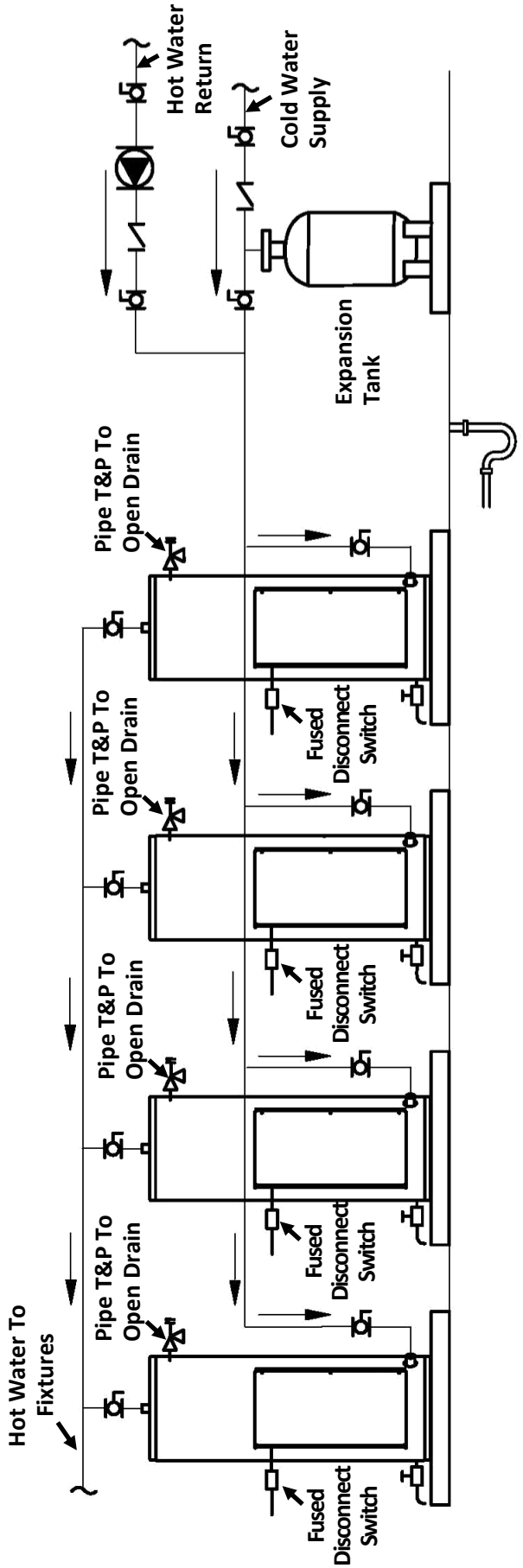
Commercial Electric Water Heater: 2 Units



WARNING: This drawing shows suggested piping configuration and other devices. Check with local codes and ordinances for additional requirements.

Figure 11

Commercial Electric Water Heater: 4 Units



WARNING: This drawing shows suggested piping configuration and other devices. Check with local codes and ordinances for additional requirements.

Figure 12

8. Warranty

Rinnai Commercial Electric Water Heater Models: RCET5012, RCET5018, RCET8012, RCET8018

What is Covered?

The Rinnai Standard Limited Warranty covers any defects in materials or workmanship when the product is installed and operated according to Rinnai written installation instructions, subject to the terms within this Limited Warranty document. This Limited Warranty applies only to products that are installed correctly in the United States and Canada. Improper installation may void this Limited Warranty. It is recommended that a trained and qualified professional who has attended a Rinnai installation training class complete your installation. This Limited Warranty coverage, as set out in the table below, extends to the original purchaser and subsequent owners, but only while the product remains at the site of the original installation, and terminates if the product is moved or reinstalled at a new location.

Item	Period of Coverage (From Date of Purchase)
Electric Water Heater Tank	3 Years
All Other Parts and Components	1 Year
Reasonable Labor	1 Year

What Will Rinnai Do?

Rinnai will repair or replace the covered product or any part or component that is defective in materials or workmanship as set forth in the above table. Rinnai will pay reasonable labor charges associated with the repair or replacement of any such part or component during the term of the labor warranty period. All repair parts must be genuine Rinnai parts. All repairs or replacements must be performed by a qualified professional who is properly trained to do the type of repair.

Replacement of the product may only be authorized by Rinnai at its sole discretion. Rinnai does not authorize any person or company to assume for it any obligation or liability in connection with the replacement of the product. If Rinnai determines that repair of a product is not possible, Rinnai may replace the product with a comparable product at Rinnai's sole discretion. The warranty claim for product parts and labor may be denied if a component or product returned to Rinnai is found to be free of defects in material or workmanship; damaged by improper installation, use or operation; or damaged during return shipping.

How To Obtain Service

For the name of a trained and qualified professional, please contact your place of purchase, visit the Rinnai website (www.rinnai.us or www.rinnai.ca), call Rinnai at 1-800-621-9419 or write to Rinnai at 103 International Drive, Peachtree City, Georgia 30269.

To obtain warranty you are required to show proof of purchase with a dated sales receipt, or by registering within 30 days of purchasing the product. To register your Rinnai Electric Water Heater, please visit www.rinnai.us or www.rinnai.ca. For those without internet access, please call 1-800-621- 9419. Receipt of registration by Rinnai will constitute proof-of-purchase for this product. Registration of product installed in new home construction may be verified with a copy of the closing papers provided by the initial home buyer. However, registration is not necessary in order to validate this Limited Warranty.

What Is Not Covered?

This Limited Warranty does not cover any failures or operating difficulties due to the following:

- Accident, abuse, or misuse
- Alteration of the product or any component part
- Misapplication of this product
- Improper installation (such as but not limited to):
  - Product being installed in a corrosive environment
  - Incorrect water pressure
  - Absence of a drain pan under the appliance
- Improper maintenance (such as but not limited to scale build-up or freeze damage)
- Incorrect sizing
- Any other cause not due to defects in materials or workmanship
- Problems or damage due to fires, flooding, electrical surges, freezing or any acts of God
- Any damage caused by poor water quality
- Operating the water heater with anything other than potable water at all times
- Force majeure

There is no warranty coverage on product installed in a closed loop application, commonly associated with space heating only applications.

This Limited Warranty does not apply to any product whose serial number or manufacture date has been defaced.

This Limited Warranty does not cover any product used in an application that uses chemically treated water such as a pool or spa heater.

Limitation on Warranties

No one is authorized to make any other warranties on behalf of Rinnai America Corporation. Except as expressly provided herein, there are no other warranties, expressed or implied, including, but not limited to warranties of merchantability or fitness for a particular purpose, which extend beyond the description of the warranty herein.

Any implied warranties of merchantability and fitness arising under state law are limited in duration to the period of coverage provided by this Limited Warranty, unless the period provided by state law is less. Some states do not allow limitations on how long an implied Limited Warranty lasts, so the above limitation may not apply to you.

Rinnai shall not be liable for indirect, incidental, special, consequential or other similar damages that may arise, including lost profits, damage to person or property, loss of use, inconvenience, or liability arising from improper installation, service or use. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Rinnai America Corporation

103 International Drive
Peachtree City, GA 30269
Tel. 1-800-621-9419
Web. www.rinnai.us
www.rinnai.ca

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