

# Freeze Protection for Tankless Water Heaters

## Installation Instructions

Kit Name	Freeze Protection Kit
Kit Part Number	104000285
Compatible Rinnai Tankless Water Heater Models	<p><b>Models Without Internal Recirculation Pump:</b> RU199i/e, RU180i/e, RU160i/e, RU130i/e, CU199i/e, CU160i/e, RE199i/e, RE180i/e, RE160i/e, RE140i/e, RX199i, RX180i, RX160i, RX130i, CX199i, CX160i</p> <p><b>Models With Internal Recirculation Pump:</b> RUR199i/e, RUR160i/e, REP199i/e, REP160i/e, RXP199i, RXP160i, CXP199i, CXP160i, RSC199i/e, RSC160i/e</p>

**WARNING** Failure to correctly assemble the components according to these instructions may result in electric shock, injury, or death.

### CAUTION

To protect yourself from harm, follow the steps below before proceeding:

- Turn off the electrical power supply by unplugging the power cord or by turning off the electricity at the circuit breaker. (The temperature controller does not control the electrical power.)
- Turn off the gas at the manual gas valve, usually located immediately below the water heater.
- Turn off the incoming water supply. This can be done at the isolation valve immediately below the water heater or by turning off the water supply to the building.

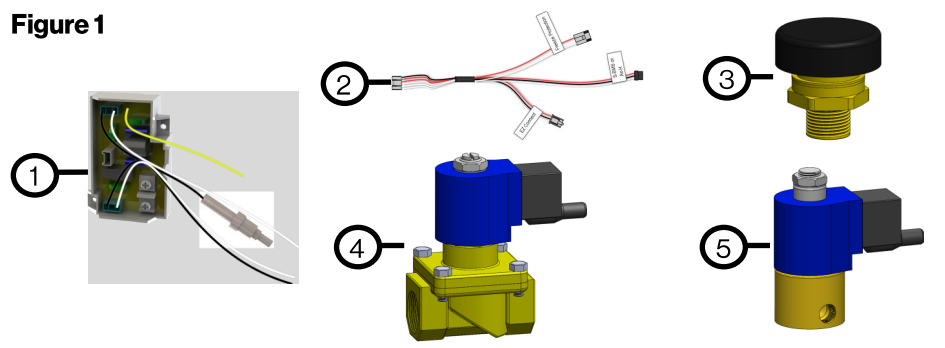
## Items Inside Product Box

Before you begin, please make sure all parts are located inside the product box.

Table 1.

Item #	Item	Qty
1	Surge Protector	1
2	Accessory Cable	1
3	Vacuum Breaker	1
4	3/4 in. NC Solenoid	1
5	1/4 in. NO Solenoid	2

Figure 1



# Rinnai

## TOOLS/MATERIALS REQUIRED (FIELD-SUPPLIED)

- 3/4 in. Tee and Nipple
- Phillips Head Screwdriver
- Pliers or Channel Locks
- Teflon Tape or Pipe Sealant

## Instructions

### ▶ IMPORTANT

- When performing the steps in this document, you must follow the wiring guidelines established by the National Electrical Code (NEC).
- When electrical power to the water heater fails, the 3/4 in. solenoid valve closes (stopping the flow of water into the water heater) and the two 1/4 in. solenoid valves open (allowing the water heater and associated piping to drain).









1. Turn off and disconnect 120 V power supply.
2. Turn off water supply.
3. Turn off gas supply.
4. Install the 3/4 in. and 1/4 in. solenoid valves (supplied) to the water lines as shown in the diagrams in "Appendix A: Piping Installation Steps."
5. Install the freeze protection circuit board and make connections according to the instructions in section "Appendix B: Circuit Board Installation Steps."

## Appendix A: Piping Installation Steps

Appendix A is divided into the following two sections. Refer to the section applicable to your tankless water heater.

- **Piping Installation for Models *Without* Internal Recirculation Pump**
- **Piping Installation for Models *With* Internal Recirculation Pump**

The key below refers to the diagrams in this section.

KEY	
	3/4" Ball Valve
	3/4" Union
	Check Valve
	Pressure Relief Valve
	Pressure Regulator
	Circulating Pump
	Boiler Drain Valve
	Solenoid Valve

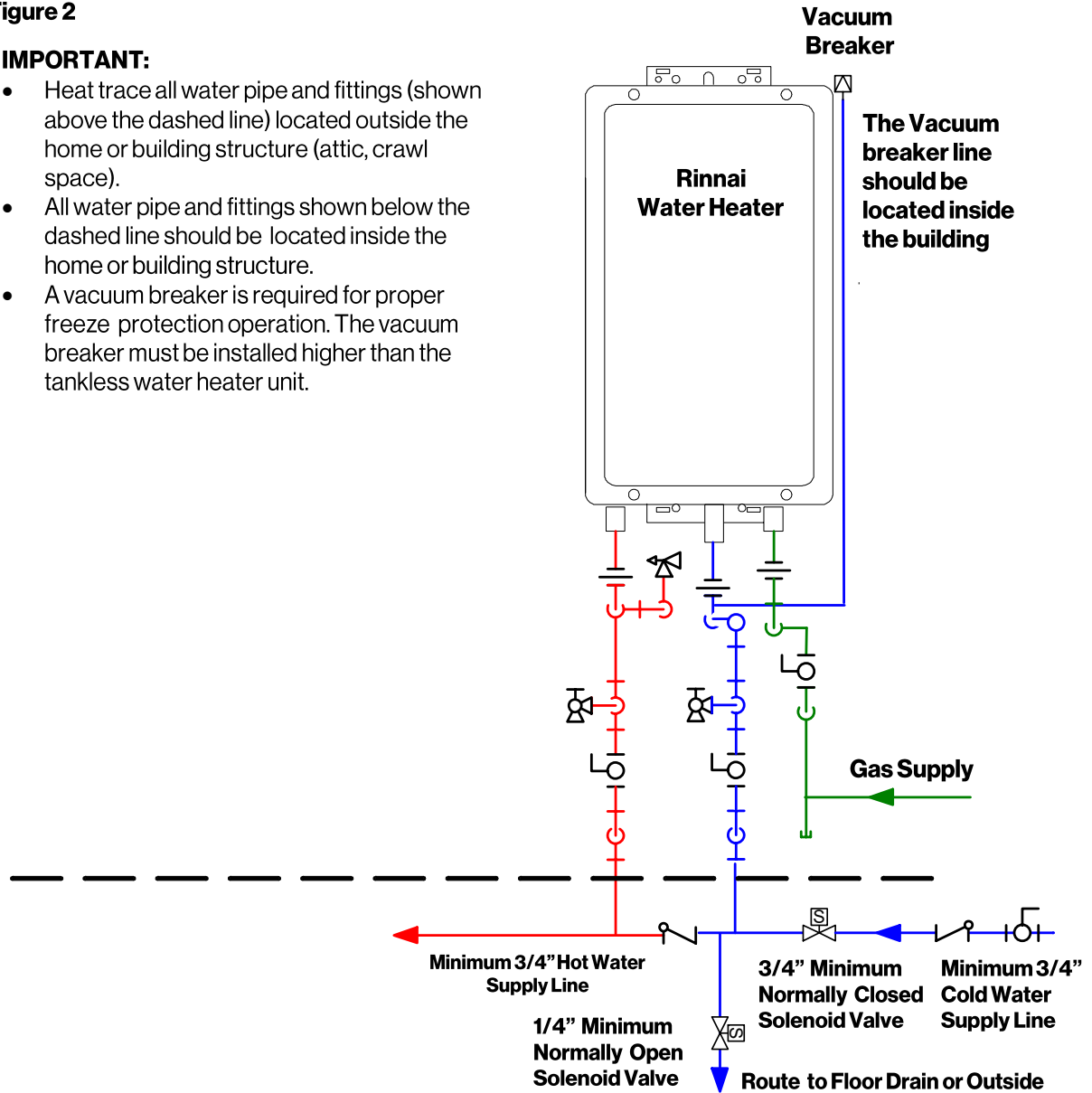
## Piping Installation for Models *Without* Internal Recirculation Pump

<b>Compatible Rinnai Tankless Water Heater Models:</b>	RE199i/e, RE180i/e, RE160i/e, RE140i/e, RX199i, RX180i, RX160i, RX130i, CX199i, CX160i
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**Figure 2**

**IMPORTANT:**

- Heat trace all water pipe and fittings (shown above the dashed line) located outside the home or building structure (attic, crawl space).
- All water pipe and fittings shown below the dashed line should be located inside the home or building structure.
- A vacuum breaker is required for proper freeze protection operation. The vacuum breaker must be installed higher than the tankless water heater unit.



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

## Piping Installation for Models *Without* Internal Recirculation Pump

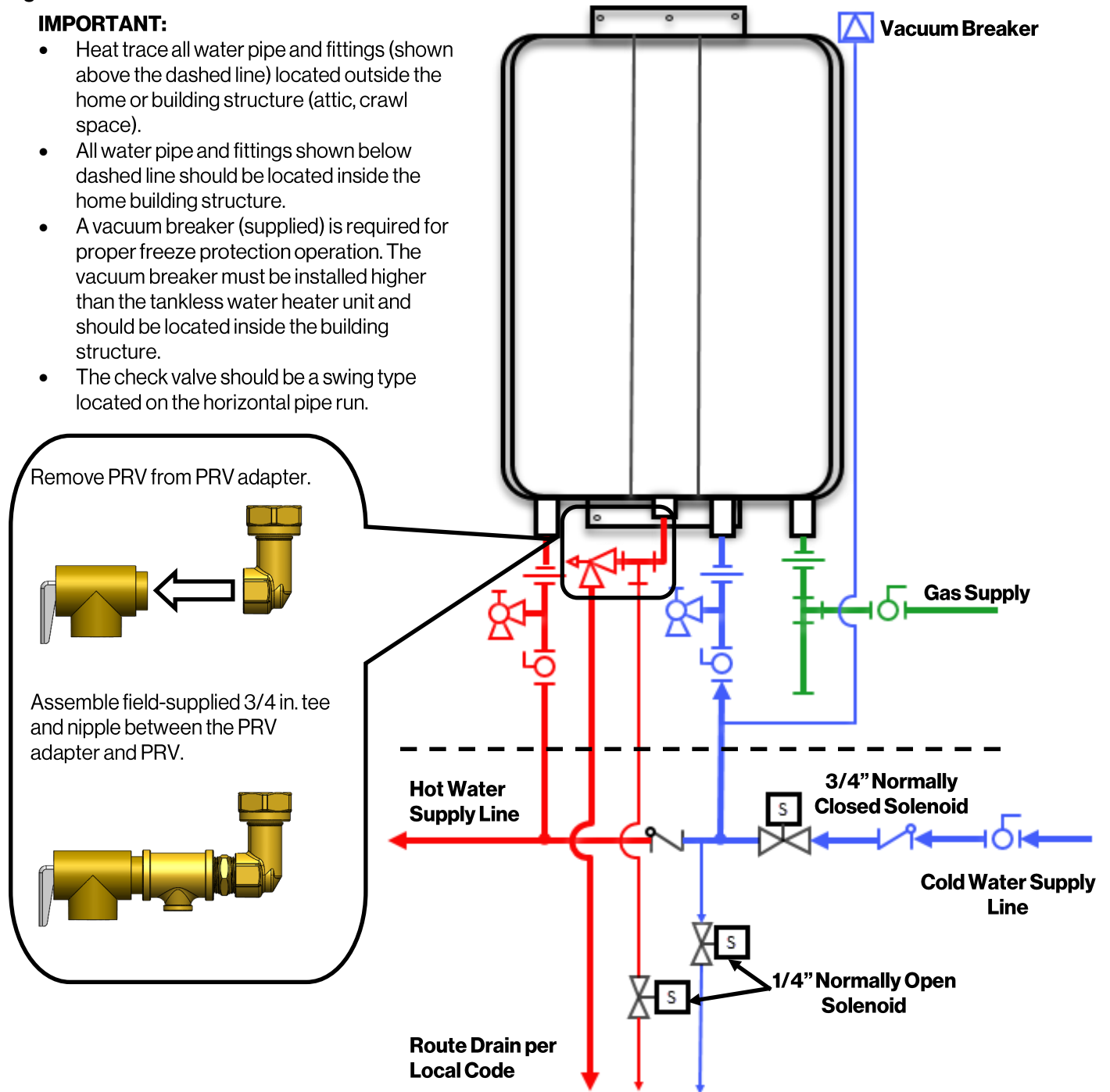
**Compatible Rinnai Tankless Water Heater Models:**

RU199i/e, RU180i/e, RU160i/e, RU130i/e, CU199i/e, CU160i/e

**Figure 3**

**IMPORTANT:**

- Heat trace all water pipe and fittings (shown above the dashed line) located outside the home or building structure (attic, crawl space).
- All water pipe and fittings shown below dashed line should be located inside the home building structure.
- A vacuum breaker (supplied) is required for proper freeze protection operation. The vacuum breaker must be installed higher than the tankless water heater unit and should be located inside the building structure.
- The check valve should be a swing type located on the horizontal pipe run.



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## Piping Installation for Models *With* Internal Recirculation Pump

**Compatible Rinnai Tankless Water Heater Models:**

RUR199i/e, RUR160i/e, REP199i/e, REP160i/e, RXP199i, RXP160i, CXP199i, CXP160i, RSC199i/e, RSC160i/e

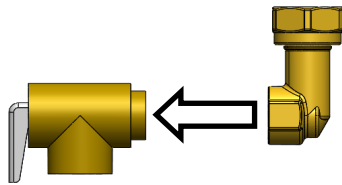
**Figure 4**

**IMPORTANT:**

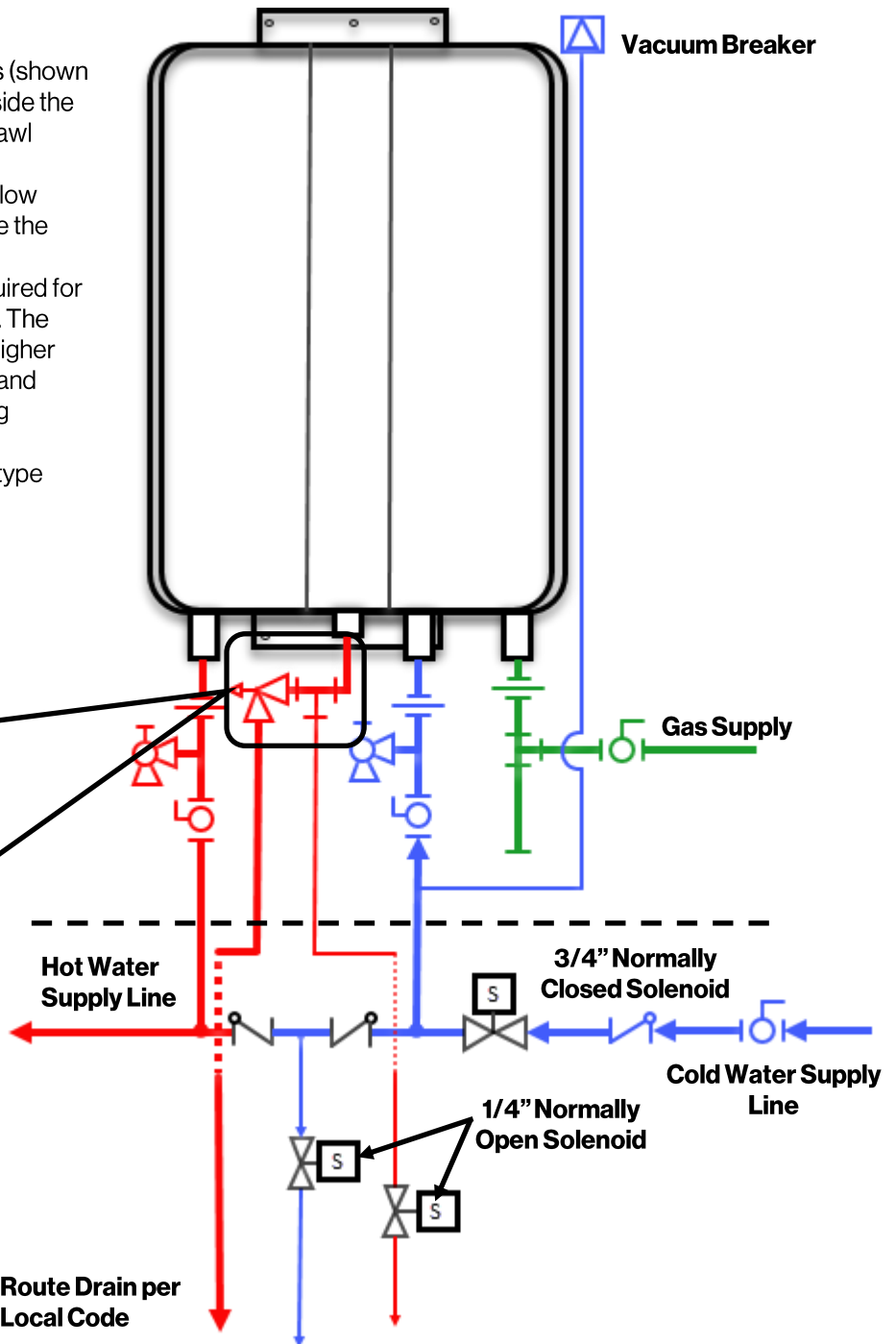
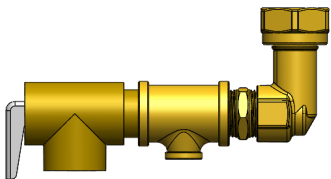
- Heat trace all water pipe and fittings (shown above the dashed line) located outside the home or building structure (attic, crawl space).
- All water pipe and fittings shown below dashed line should be located inside the home building structure.
- A vacuum breaker (supplied) is required for proper freeze protection operation. The vacuum breaker must be installed higher than the tankless water heater unit and should be located inside the building structure.
- The check valve should be a swing type located on the horizontal pipe run.

**NOTICE: FOR MODELS WITH SEPARATE PRV CONNECTIONS ONLY:**

Remove PRV from PRV adapter.



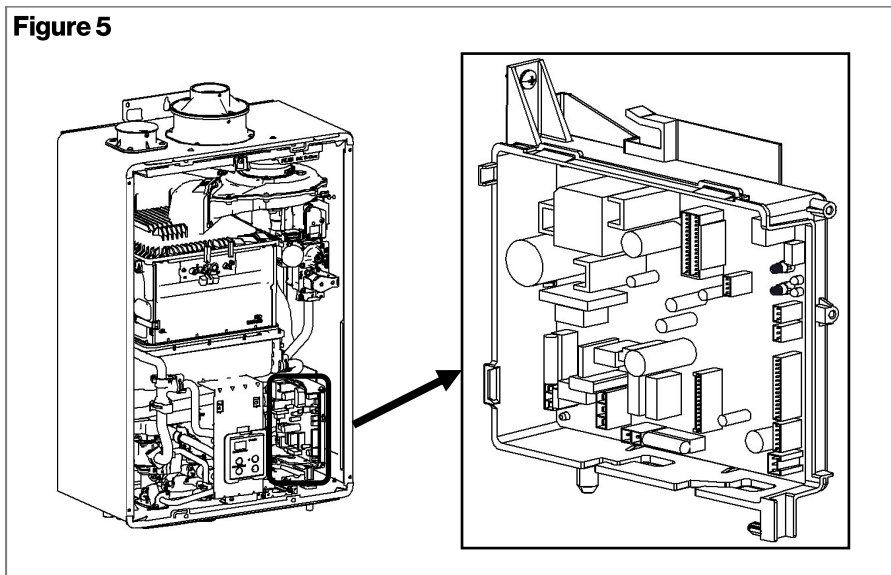
Assemble field-supplied 3/4 in. tee and nipple between the PRV adapter and PRV.



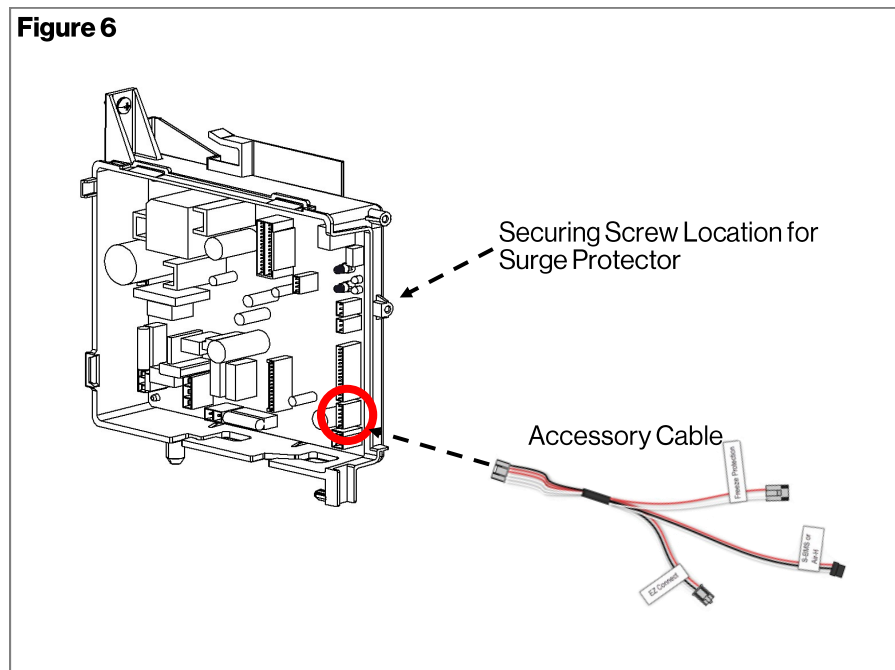
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## Appendix B: Circuit Board Installation Steps

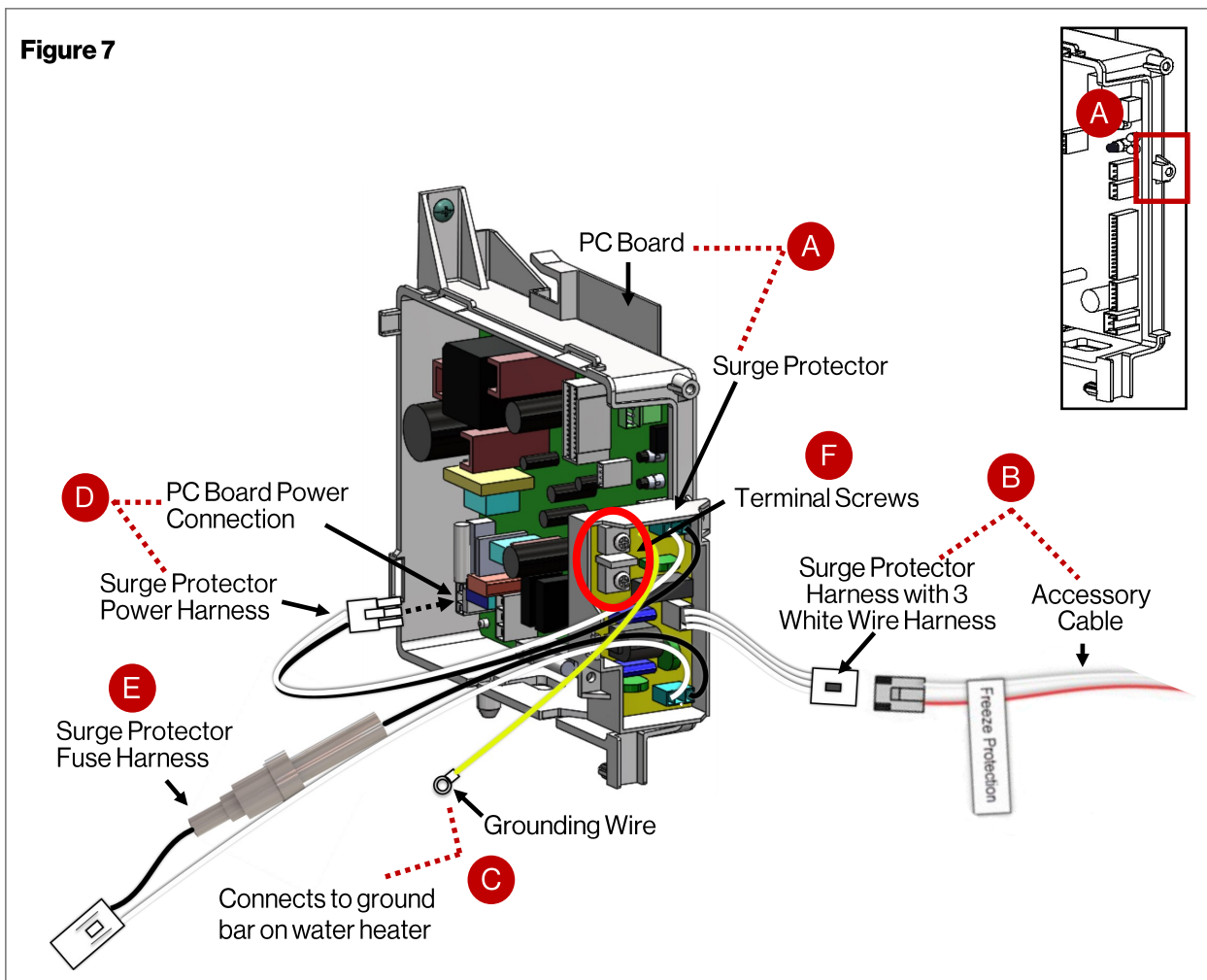
1. Power OFF the water heater by unplugging the power cord or turning off the circuit breaker. The controller on the water heater does not control the electrical power.
2. Remove the front panel of the water heater by removing the four screws that secure the panel in place. Refer to the Tankless Water Heater Installation and Operation Manual for detailed steps.
3. Locate the PC board in the bottom, right corner of the water heater (Figure 5).



4. Connect the accessory cable (supplied) to the accessory port at the bottom of the PC board (Figure 6).



5. Install the surge protector (supplied) into the upper screw hole the PC Board (“A” in Figure 7).
6. Insert Accessory Cable end labeled “Freeze Protection” into surge protector harness with three white wires (“B” in Figure 7).
7. Secure the grounding wire (“C” in Figure 7) to the ground bar on the tankless water heater.
8. Disconnect BK/WT power harness from PC Board and connect it to Surge Protector Fuse Harness (“D” and “E” in Figure 7).
9. Connect the power connection from the PC Board to surge protector fuse harness (“E” in Figure 7).
10. Connect the solenoid wires to the terminal screws in the surge protector (“F” in Figure 7).



11. Re-install the water heater front panel.
12. Power on the water heater.

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