

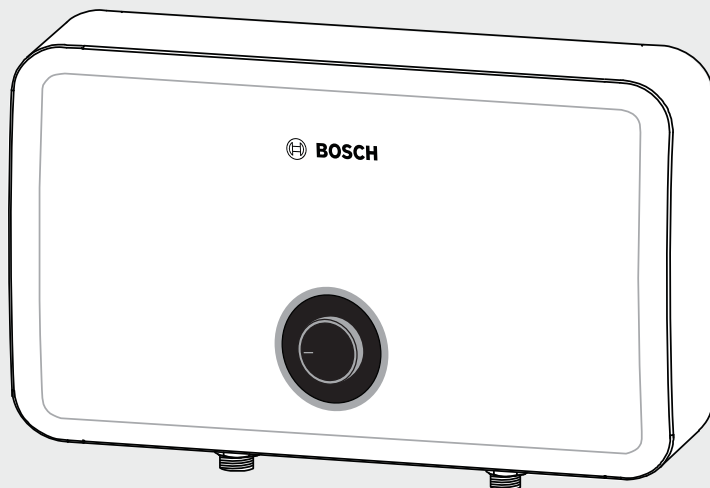


BOSCH

Installation Manual

Electric Tankless Water Heaters **TRONIC 4000 C**

TR4000C-3 | TR4000C-6 | TR4000C-8 | TR4000C-10 | TR4000C-13



⚠ WARNING:

This manual must only be used by a qualified installer / service technician. Read all instructions in this manual before installing. Perform steps in the given order. Failure to do so could result in substantial property damage, severe personal injury, or death.

⚠ WARNING:

Improper installation, adjustment, alteration, service or maintenance can cause injury, death, or property damage.

NOTICE:

The manufacturer reserves the right to make product changes or updates without notice and will not be held liable for typographical errors in literature.

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1 Key to Symbols and Safety Instructions

1.1 Key to Symbols

Warnings



Warnings in this document are identified by a warning triangle printed against a grey background. Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:

- ▶ **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- ▶ **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- ▶ **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.
- ▶ **NOTICE** is used to address practices not related to personal injury.

Important information



This symbol indicates important information where there is no risk to people or property.

1.2 Safety

Please read before proceeding



Installation should be made in accordance with the regulations of the Authority Having Jurisdiction, local code authorities, and utility companies which pertain to this type of water heating equipment. Authority Having Jurisdiction (AHJ) – The AHJ may be a federal, state, local government, or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department or health department, building official or electrical inspector, or others having statutory authority. In some circumstances, the property owner or his/ her agent assumes the role, and at government installations, the commanding officer or departmental official may be the AHJ.



WARNING: IMPORTANT SAFETY INSTRUCTIONS

- ▶ When using electrical appliances, basic safety precautions to reduce the risk of fire, electric shock, or injury to persons should be followed, including:
 1. READ ALL INSTRUCTIONS BEFORE USING THIS WATER HEATER.
 2. This water heater must be grounded.
 3. Install or locate this water heater only in accordance with the provided installation instructions.
 4. Do not use this water heater for anything other than its intended purpose (as described in this manual). Doing so could result in property damage and WILL VOID product warranty.
 5. For power supply connection, use the correct AWG wires or larger, suitable for at least suitable for at least 194°F (90°C).
 6. The heater must be connected to dedicated circuit breakers. When the heater is not within sight of the electrical circuit breakers, a circuit breaker lockout or additional local means of disconnection for all nongrounded conductors must be provided that is within sight of the appliance. (Ref NEC 422.31.).
 7. The plumbing installation must be completed before the electrical installation.
 8. The plumbing installation requires metal pipes or reinforced hoses that can withstand pressure up to 116 psi.
 9. To ensure proper operation, the water supply flow rate must be at least 0.55 gpm.
 10. Do not install the heater where it may be subjected to direct sunlight, rain, splashing water, or freezing temperatures.
 11. Before connecting the unit to a public power network, consult the local power supply authority to ensure the power network meets the stated requirements.
 12. Do not operate this water heater if it has damaged wiring, if it is not working properly, or if it has been damaged or dropped.
 13. This water heater should be serviced only by qualified service personnel. Contact the water heater installer or a qualified service agency for examination, repair, or adjustment.


WARNING: IMPROPER OR DANGEROUS OPERATION

- ▶ Installations Must Comply With: Local, state, provincial, and national codes, laws, regulations, and ordinances. The latest version of the National Electrical Code, NFPA No. 70.


WARNING: HAZARDOUS VOLTAGE

- ▶ When Servicing the Water Heating System be sure to disconnect electrical power before performing service. Failure to do so could result in electrical shock, property damage, serious personal injury, or death.


WARNING: IMPROPER OR DANGEROUS OPERATION

- ▶ If the water heater is exposed to the following, do not operate. Immediately call a qualified service technician.
 - Fire
 - Damage
 - Water
 - Freezing temperatures
- ▶ Failure to follow this information could result in property damage, severe personal injury, or death.


WARNING:

- ▶ This product can expose you to chemicals including Lead and Lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.


WARNING: INDOOR INSTALLATION ONLY

- ▶ DO NOT INSTALL OUTDOORS. This water heater is certified for indoor applications only.
- ▶ This water heater is not intended for use as a pool heater.
- ▶ Failure to follow these instructions could result in FIRE, PROPERTY DAMAGE, and/or PERSONAL INJURY OR DEATH.


WARNING: PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH

- ▶ NEVER use any toxic chemical, including automotive, standard glycol antifreeze, or ethylene glycol made for hydronic (non-potable) systems. These chemicals can attack gaskets and seals in water systems, are poisonous if consumed, and can cause personal injury or death.


WARNING: FIRE, CARBON MONOXIDE

- ▶ Install all system components and piping in such a manner that does not reduce the performance of any fire suppression devices or system.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ Do not use petroleum-based cleaning or sealing compounds in a water heating system. Gaskets and seals in the system may be damaged. This can result in substantial property damage.


WARNING: IMPROPER OR DANGEROUS OPERATION

- ▶ DO NOT USE THIS WATER HEATER IF ANY PART HAS BEEN SUBMERGED IN WATER. Immediately call a qualified service technician. The water heater MUST BE replaced if it has been submerged. Attempting to operate a water heater that has been submerged could create numerous harmful conditions, such as a potential gas leakage causing a fire and/or explosion, or the release of mold, bacteria, or other harmful particulates into the air. Operating a previously submerged water heater could result in property damage, severe personal injury, or death. **Water heater damage due to flood or submersion is considered an Act of God, and IS NOT covered under product warranty.**

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ If the water heater has been stored in a very cold location (BELOW 32°F) before installation, handle with care until the components come to room temperature. Failure to do so could result in damage to the water heater.


WARNING: IMPROPER OR DANGEROUS OPERATION

- ▶ The manufacturer cannot be responsible for damages caused by improper installation or by failure to follow the instructions in this manual.

NOTICE: SAFE DRINKING WATER ACT

- ▶ The surfaces of these products contacted by potable (consumable) water contain less than 0.25% lead by weight as required by the Safe Drinking Water Act, Section 1417.

Scalding

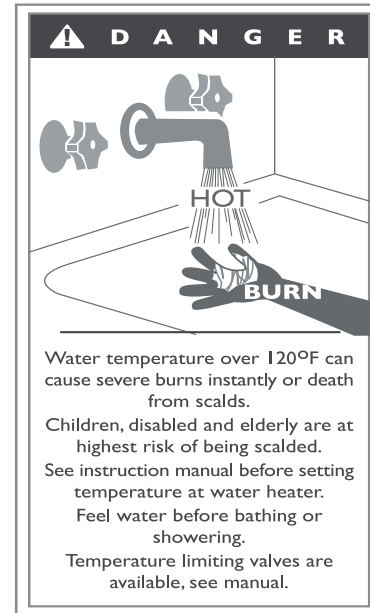
This water heater can deliver scalding water. Be careful whenever using hot water to avoid scalding injury. Certain appliances such as dishwashers and automatic clothes washers may require increased water temperatures. By setting the power selector on this heater to obtain the increased water temperature required by these appliances you may create the potential for scald injury.

Table 1 details the relationship of water temperature and time with regard to scald injury and may be used as a guide in determining the safest water temperature for your applications.

Temperature	Time to Produce Serious Burn
120 °F (48 °C)	More than 5 minutes
125 °F (51 °C)	1.5 to 2 minutes
130 °F (54 °C)	Approx. 30 seconds
135 °F (57 °C)	Approx. 10 seconds
140 °F (60 °C)	Less than 5 seconds
145 °F (62 °C)	Less than 3 seconds
150 °F (65 °C)	Approx. 1.5 seconds
155 °F (68 °C)	Approx. 1 second

Table 1

The recommended hot water outlet temperature is 118°F. If the water heater is going to have a set temperature above 120°F, it is recommended to use an ASSE 1017 rated mixing valve to avoid severe burns or death from scalding temperatures.



WARNING: SCALD HAZARD

- ▶ Scald injury is heightened by increased water temperatures. Hot water can produce 3rd degree burns in 6 seconds at 140°F and in 30 seconds at 130°F.
- ▶ If the Water Heater thermostat is set too high there is Serious Potential for SCALDING.
- ▶ Households with small children, disabled, or elderly persons may require a 120°F or lower temperature setting.
- ▶ An ASSE 1017 or ASSE 1070 temperature limiting or mixing valve is recommended in installations servicing disabled or elderly persons, or children. Mixing valves do not eliminate the risk of scalding. To avoid scalding:
 - Set the water heater set point temperature as low as possible.
 - Feel water before bathing or showering.

If thermostatic valves are required, use devices specifically designed for such purpose. Install these devices in accordance with instructions provided by the manufacturer. Failure to install a temperature limiting or mixing valve and follow these instructions could result in property damage, severe personal injury, or death due to scalds.

2 Prepare the Water Heater

2.1 Inspection

Inspect the water heater once removed from packaging. Do not install if there are signs of physical damage.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ **COLD WEATHER HANDLING** - If the water heater has been stored in a very cold location (BELOW 32°F) before installation, handle with care until the components come to room temperature. Failure to do so could result in damage to the water heater.

2.2 Water Heater Rating Label Location

When inquiring about service or troubleshooting, reference the model and serial numbers from the water heater rating label. The serial number can also be found inside of the unit.

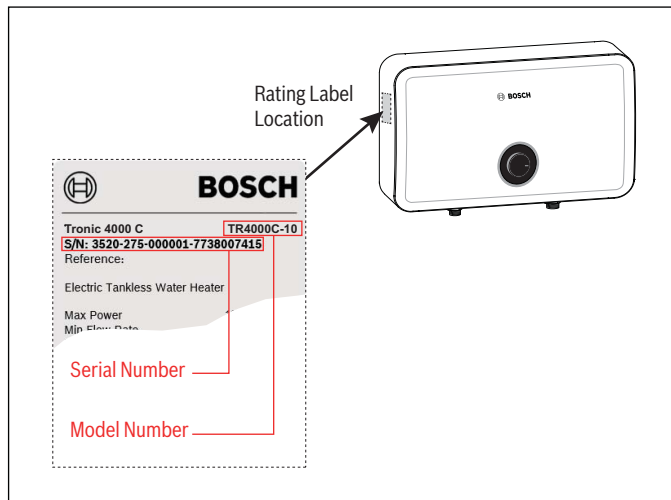


Figure 1

2.3 Clearances

Heater must have room for service. Please observe the following minimum recommended service clearances.

	minimum recommended service clearance
Front	6"
Sides	6"
Top	12"
Bottom	12"

Table 2

A combustibile door or removable panel is acceptable for front clearance.

This water heater has been approved for closet installation.



If you do not provide the minimum recommended service clearances it might not be possible to service the water heater without removing it from the space to service.



WARNING: FIRE, EXPLOSION

- ▶ Please keep any flammable materials at least 24" (610mm) away from the water heater and hot outlet pipe.



WARNING: FIRE

- ▶ High heat sources (sources generating heat 100°F / 37°C or greater, such as stove pipes, space heaters, etc.) may damage plastic components of the water heater. Such damages ARE NOT covered by warranty. It is recommended to keep a minimum clearance of 8" from high heat sources. Observe heat source manufacturer instructions, as well as local, state, provincial, and national codes, laws, regulations and ordinances when installing this water heater and related components near high heat sources.

2.4 Locating the Water Heater



WARNING: FREEZE DAMAGE - INDOOR INSTALLATION ONLY

- ▶ **DO NOT INSTALL OUTDOORS.** This water heater is certified for indoor installation only. Outdoor installations ARE NOT covered by warranty. Failure to install the water heater indoors could result in property damage, severe personal injury, or death.
- ▶ Consider piping and installation when determining heater location.

NOTICE: PROPERTY DAMAGE

- ▶ All water heaters may eventually leak. Locate the water heater where any leakage from the relief valve, related piping, or connections will not result in damage to surrounding areas or lower floors of the building. Any water heater should be installed in such a manner that if it should leak the resulting flow of water will not cause damage to the area in which it is installed. National Plumbing codes require a drain pan for any water heater installation. Failure to install one is the sole responsibility of owner and/or installer. Reference UPC 2000 (Uniform Plumbing Code) Section 510 - Protection from Damage or IPC 200 (International Plumbing code) Section 504 - Safety Devices. Leakage damages ARE NOT covered by warranty. In addition, water leak detection devices and automatic water shutoff valves are readily available at plumbing supply houses. IT IS HIGHLY RECOMMENDED BY THE MANUFACTURER TO INSTALL WATER LEAK DETECTION DEVICES AND AUTOMATIC SHUTOFF VALVES IN ANY WATER HEATER INSTALLATION WHERE A LEAKAGE OF WATER COULD RESULT IN PROPERTY DAMAGES.

2.4.1 Installation Area Operating Conditions

- ▶ This water heater must be installed upright in the vertical position and on a level wall surface as described in this manual.



WARNING: IMPROPER OR DANGEROUS OPERATION

- ▶ DO NOT attempt to install this water heater in any other orientation. Doing so will result in improper water heater operation and property damage, and could result in serious personal injury or death.

- ▶ Ensure ambient temperatures are higher than 32°F / 0°C and lower than 104°F / 40°C.



Attic ambient temperatures may frequently exceed 104°F.



WARNING: IMPROPER OR DANGEROUS OPERATION

- ▶ Extreme ambient conditions can lead to damage to the heating system and put safe operation at risk. Ensure that the installation location adheres to the information included in this manual. Failure to do so could result in property damage, serious personal injury, or death.

- ▶ Avoid continuously high levels of humidity, moisture, or dust, or an area that may be splashed with water or other liquids. DO NOT install under water pipes or air conditioning lines that might leak or condense onto the water heater.



When installing in a minimum clearance location, it may not be possible to read or view some product labeling. It is recommended to make note of the water heater model and serial number.



WARNING: SCALD HAZARD

- ▶ Keep water heater and hot outlet piping securely out of the reach of children to prevent tampering with the controls or contact with an extremely hot pipe.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ The service life of the water heater's exposed metallic surfaces, such as the junction box, is directly influenced by proximity to damp and salty marine environments. In such areas higher concentration levels of chlorides from sea spray coupled with relative humidity can lead to degradation of water heater components and cause premature water heater failure. Such failures ARE NOT covered by warranty.

2.4.2 Freeze Protection



Failure of the water heater due to freeze related damage IS NOT covered by product warranty.

If the ambient temperature falls below 32°F (0°C), protect the heater from potential damage by shutting off power to the unit by means of the dedicated circuit breaker on the main electrical panel. Open a faucet slightly to cause water to flow continuously through the device at a very low rate, without heating. Restore power to the unit when temperature conditions allow.

If the water freezes inside the unit, it can cause damage that is not covered by warranty. If you suspect water has frozen within the unit, do not turn it on until you are certain the frozen water has melted and there are no leaks in the unit. It is recommended to contact a qualified electrician or customer service in this situation.



WARNING: PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH

- ▶ NEVER use any toxic chemical, including automotive, standard glycol antifreeze, or ethylene glycol made for hydronic (non-potable) systems. These chemicals can attack gaskets and seals in water systems, are poisonous if consumed, and can cause personal injury or death.

2.4.3 Choosing a Location

Choose a location for the water heater based on its intended usage. If it is to be used as a whole house water heater, locate it as centralized to the piping and electrical system as possible. Also, locate the water heater and domestic water piping where it will not be exposed to freezing temperatures. All piping should be insulated to minimize heat loss.

If the water heater is to be used for a single point of use (i.e. bathroom sink), locate the unit as close to the hot water fixture as possible to minimize heat loss and hot water wait times.

Additionally, place the water heater so that the drain, controls, and inlets/outlets are easily accessible.



In some states including the State of California, the water heater must be braced, anchored, or strapped to avoid moving during an earthquake. Contact local utilities or agency having jurisdiction for code requirements in your area.



WARNING: FIRE, EXPLOSION

- ▶ This water heater must not be located near flammable liquids such as gasoline, butane, liquefied propane, adhesives, solvents, paint thinners, etc., as the controls of this water heater could ignite these vapors and cause an explosion resulting in property damage, severe personal injury, or death.

3 Water Quality Requirements


CAUTION: PROPERTY DAMAGE, PRODUCT DAMAGE

- Chemical imbalance of the water supply may affect efficiency and cause severe damage to the appliance and associated equipment. Water quality must be professionally analyzed to determine whether it is necessary to treat the water. Various solutions are available to adjust water quality. Adverse water quality will affect the reliability of the system. In addition, operating temperatures above 135°F will accelerate the build-up of lime scale and possibly shorten appliance service life. Failure of an appliance due to lime scale build-up, low pH, or other chemical imbalance IS NOT covered by the warranty.

The water must be potable, free of corrosive chemicals, sand, dirt, and other contaminants, and meet the manufacturer's requirements. It is up to the installer to ensure the water does not contain corrosive chemicals or elements that can damage the heat exchanger. Potable water is defined as drinkable water supplied from utility or well water in compliance with EPA secondary maximum contaminant levels (40 CFR Part 143.3). If the water contains contaminants higher than outlined by the EPA and the manufacturer, water treatment is recommended and additional, more frequent maintenance may be required. If you suspect that your water is contaminated in any way, discontinue use of the appliance and contact an authorized technician or licensed professional.

Contaminant	Maximum Allowable Level
pH	6.5 - 8.5
Total Dissolved Solids (TDS)	Less than 500 mg/L
Free CO ₂	Less than 500 mg/L
Total Hardness	Less than 200 mg/L
Aluminum	Less than 0.2 mg/L
Chloride	Less than 250 mg/L
Copper	Less than 1.0 mg/L
Iron	Less than 0.3 mg/L
Manganese	Less than 0.05 mg/L
Zinc	Less than 5 mg/L

Table 3 Water Quality Requirements

NOTICE: PRODUCT DAMAGE

- Failure of electric elements due to lime scale build-up on the heating surface, low pH, or other imbalance IS NOT covered by the warranty.



Hard water, water containing mineral concentration of over 250 mg/liter, may cause a scale build up that can damage the product. In case of hard water it is recommended to use an anti-scale treatment. Damage caused by scale is not covered by the warranty.



To promote appliance service life, it is strongly recommended to follow the maintenance procedures in this manual.

4 Water Heater Components

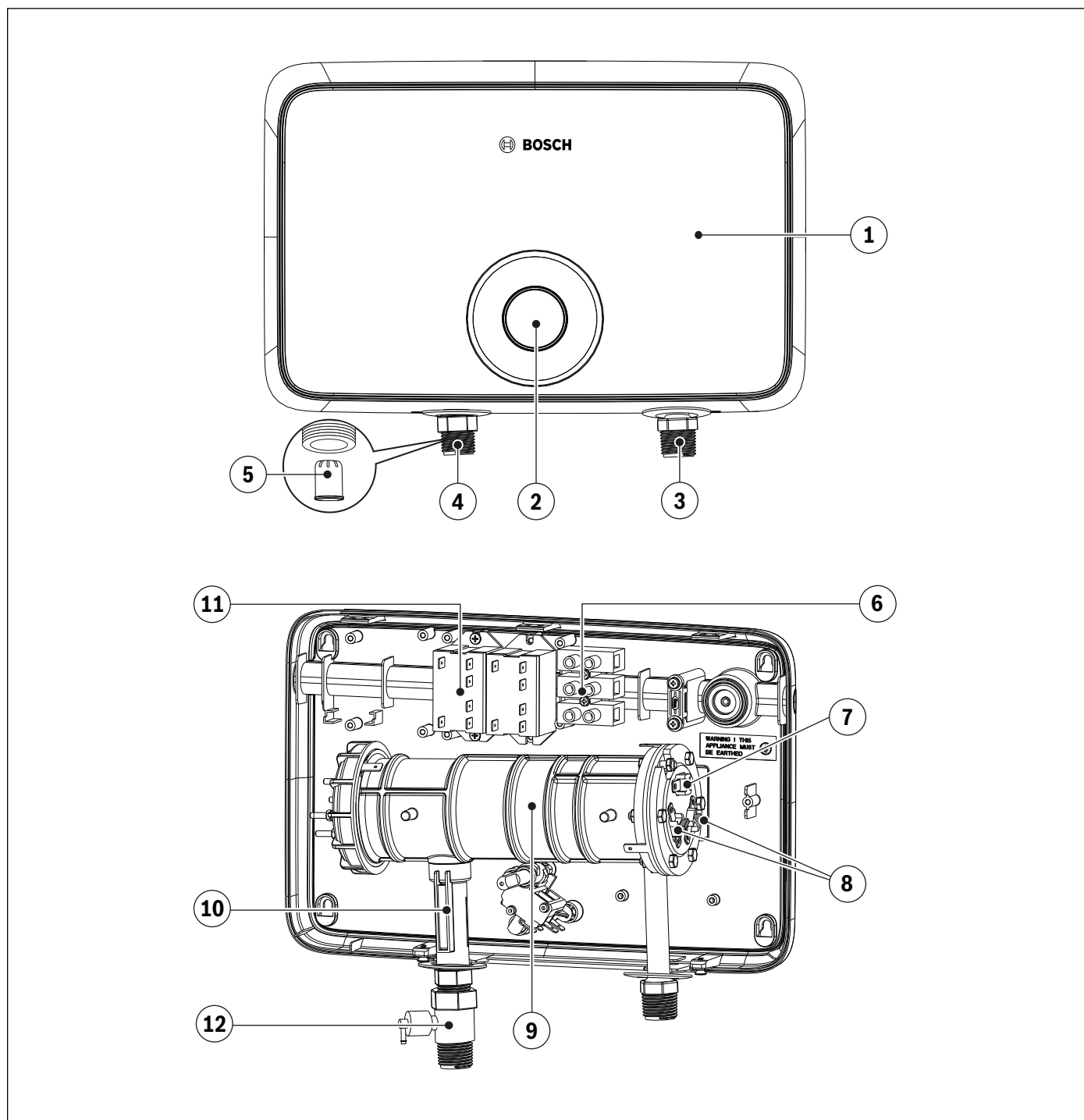


Figure 2 Water Heater Components

- | | |
|--------------------|--|
| 1 Front Cover | 7 Thermal Cutout (Auto Reset) - 10kW and 13kW only |
| 2 Power Selector | 8 Thermal Cutout (Manual Reset) |
| 3 Hot Water Outlet | 9 Canister/Heating Element |
| 4 Cold Water Inlet | 10 Flow Sensor |
| 5 Inlet Filter | 11 Relay |
| 6 Terminal Block | 12 Check Valve |

5 Dimensions

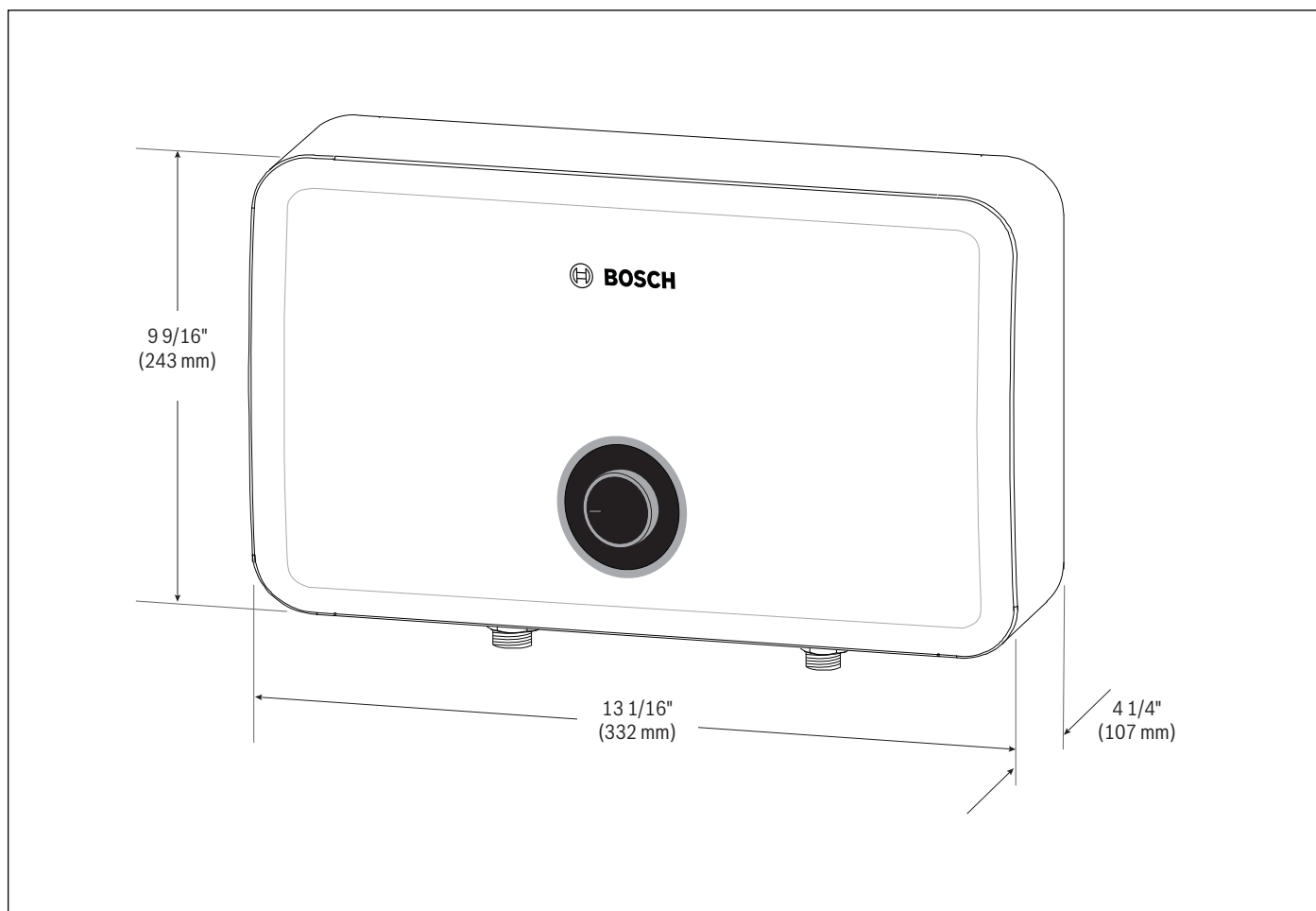


Figure 3 Dimensions

6 Technical Specifications

Description		TR4000C-3	TR4000C-6	TR4000C-8	TR4000C-10	TR4000C-13
Wattage*	110V	3.1kW	—	—	—	—
	120V	3.5kW	—	—	—	—
	208V	—	4.9kW	6.4kW	7.9kW	9.8kW
	240V	—	6.5kW	8.5kW	10.5kW	13.0kW
Voltage		110/120	240	240	240	240
Phase		1				
Circuit Breaker Size		1 x 30 Single Pole	1 x 30 Double Pole	1 x 40 Double Pole	1 x 50 Double Pole	1 x 60 Double Pole
Required Wire Size		10 AWG	10 AWG	8 AWG	6 AWG	6 AWG
Minimum Water Flow to Activate		0.55 gpm				
Working Pressure		7 - 115 psi (0.5 - 8 bar)				
Tested Pressure		230 psi (16 bar)				
Water Connections		1/2" NPT				
Elements		1				
Weight		3.4 lb (1.54 kg)				

Table 4

* Wattage based on maximum voltage supply.
Output will reduce if voltage reduces.

Temperature Rise Δt	Flow Rate (GPM)				
	TR4000C-3	TR4000C-6	TR4000C-8	TR4000C-10	TR4000C-13
35°F	0.59	1.26	1.65	2.04	2.53
45°F	N/A	0.98	1.28	1.59	1.97
77°F	N/A	0.57	0.75	0.93	1.15

Table 5

7 Installation

7.1 Wall Mounting the Water Heater

Clearances

When mounting the water heater there is no required clearance to combustibles. However, it is recommended to maintain a minimum clearance of 6" from the bottom of the unit to the floor in order to allow room for servicing.

Mounting



WARNING: ELECTRIC SHOCK HAZARD

- Ensure circuit breakers are off before proceeding with installation.

1. Remove 2 screws located on the bottom of the cover and remove.

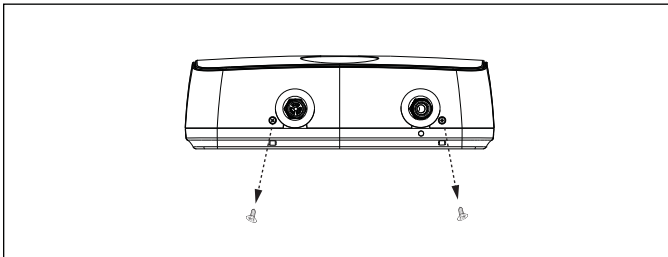


Figure 4

NOTICE: PRODUCT DAMAGE!

- **BEFORE PROCEEDING TO THE NEXT STEP**, it is important to know there is a wiring harness connected to the backside of the front cover. This must be disconnected to fully remove the cover. **DO NOT** pull cover out and away completely without disconnecting wiring first or damage may occur.

2. Pull bottom of cover forward and swing out (pos.1). Lift away from tabs on the top of the back cover (pos.2). Do not fully remove cover.

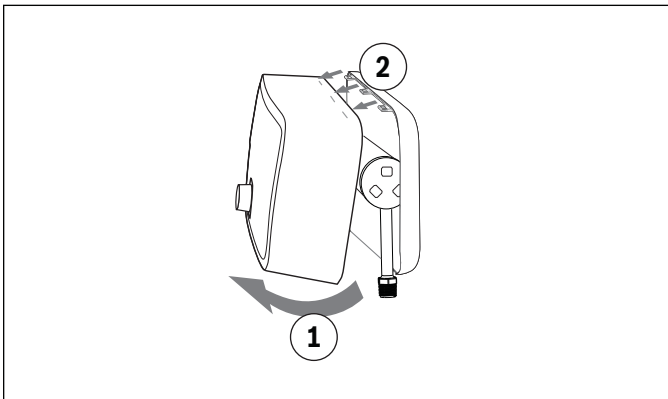


Figure 5

3. Disconnect wiring harness connected to the inside of the front cover.

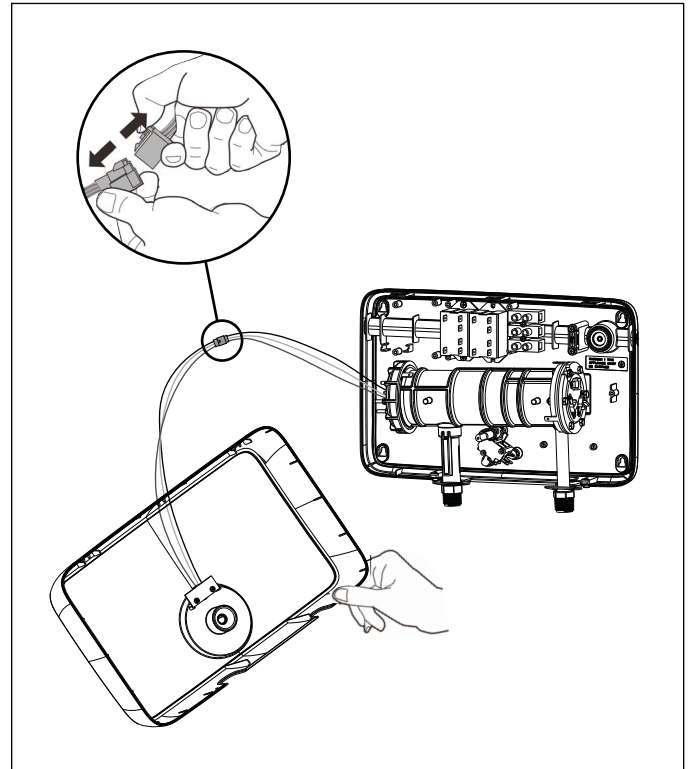


Figure 6

4. Remove cover completely.
5. Pass electrical supply wires through the round wire knockout in the back of the unit. (Figure 7).
6. Choose a suitable mounting surface that is solid and secure.



WARNING: ELECTRIC SHOCK HAZARD

- Do not install the unit above electrical boxes or junctions.

7. Position the unit on the mounting surface. Ensure the unit is level. Mount the unit to the wall with four (4) screws of at least one (1) inch in length (installer supplied) at the marked points. See Figure 5.

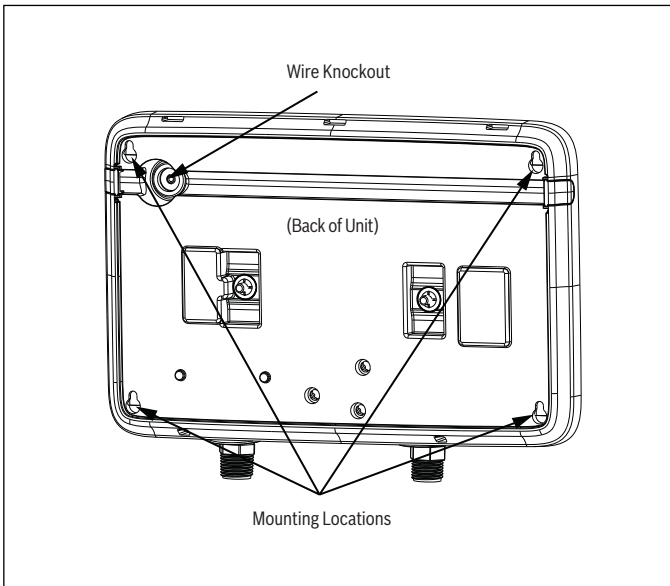


Figure 7

NOTICE: PROPERTY DAMAGE, PRODUCT DAMAGE

- Use screws suitable for the wall material and the weight of the water heater. Failure to do so could result in property damages and damage to the water heater. Such damages ARE NOT covered by the product warranty.



WARNING: IMPROPER OPERATION, PERSONAL INJURY, PRODUCT DAMAGE

- This water heater must be installed upright in the vertical position as described in this manual. DO NOT attempt to install this water heater in any other orientation. Doing so will result in improper water heater operation and property damage, and could result in serious personal injury or death.

**DO NOT INSTALL UNIT
UPSIDE DOWN, ON SIDE OR ON BACK**

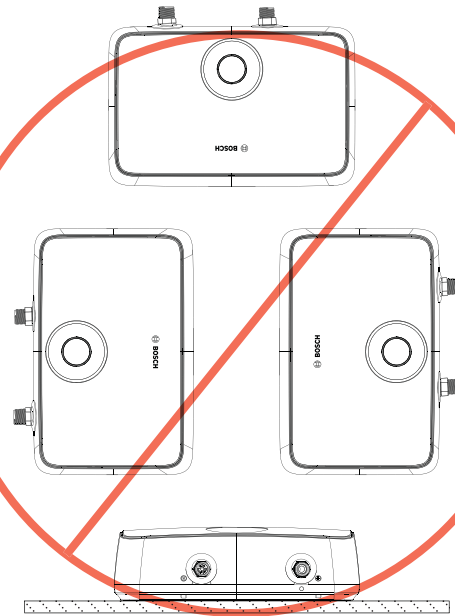


Figure 8

8. Pull gently on the water heater to ensure that it is properly mounted.

7.2 Plumbing

It is mandatory that all plumbing be done in accordance with national, local, and state plumbing codes and practices. Failure to properly install the water heater WILL VOID the warranty.



Use thread tape according to best practice on plumbing connections.

1. Install unions on the hot and cold water connections to easily disconnect the water heater for servicing. See Figure 8.



Before connecting pipes to the water heater, flush the lines to eliminate all residue and debris from the inlet and outlet lines.

2. Connect the water inlet line to the entry point of the heater (left side inlet), and connect the outlet line to the water outlet. Use a line that can withstand a minimum pressure of 150 psi. Using any other type of line will cause damage.

NOTICE: PRODUCT DAMAGE

- ▶ Do not apply heat to the Hot or Cold water heater connections. If sweat connections are used, sweat tubing to the adapter before fitting adapter to the water connections on the heater. Any heat applied to the water heater connections will permanently damage the water heater. Damages due to improper installation practices ARE NOT covered by warranty.

NOTICE: PRODUCT DAMAGE

- ▶ Failure of the water heater due to lime scale build-up on the heating surface, low pH, or other imbalance IS NOT covered by the warranty. See Section 3 Water Quality Requirements.



The maximum operating water pressure of this water heater is 115 psi / 10 bar. Residential plumbing systems with unstable pressure or pressure above 73 psi require the application of a pressure reducing valve, set to 58 - 73 psi.

- ▶ Minimum pipe size should match connection size.
- ▶ Drains and check valve between will assist in purging air from system.
- ▶ The installer is responsible for all equipment and components required by local codes. In Massachusetts, you must install a vacuum relief valve per 248 CMR. 4.

- ▶ A temperature and pressure (T&P) relief valve is not required for most installations, but may be required to meet local, state, or provincial codes. If codes require a T&P valve, install according to code and manufacturer instructions.
- ▶ Mixing valve applications are recommended to help prevent scalding.
- ▶ It is highly recommended by the manufacturer to install water leak detection devices and automatic shutoff valves in any water heater installation where a leakage of water could result in property damages See Figure 8.

7.2.1 Pressure Relief Valve

For protection against excessive pressures in this water heater, a pressure relief valve (PRV) may be installed. Refer to local codes to see if the installation of a PRV is required. Install the PRV (with a maximum set pressure of 150 psi) on the hot outlet line of the water heater, and orient it or provide tubing so that any discharge from the valve will exit at least 6" above the structural floor. The relief line cannot be in contact with any live electrical parts. The discharge opening must not be blocked or reduced in size under any circumstances.



The pre-installed check valve is not a pressure relief valve.

Commonwealth of Massachusetts

As a condition of installing this product in the Commonwealth of Massachusetts a pressure relief valve shall be installed on the hot water side, by a licensed plumber MGL 142 Section 19. (Approval number: P1-09-25).

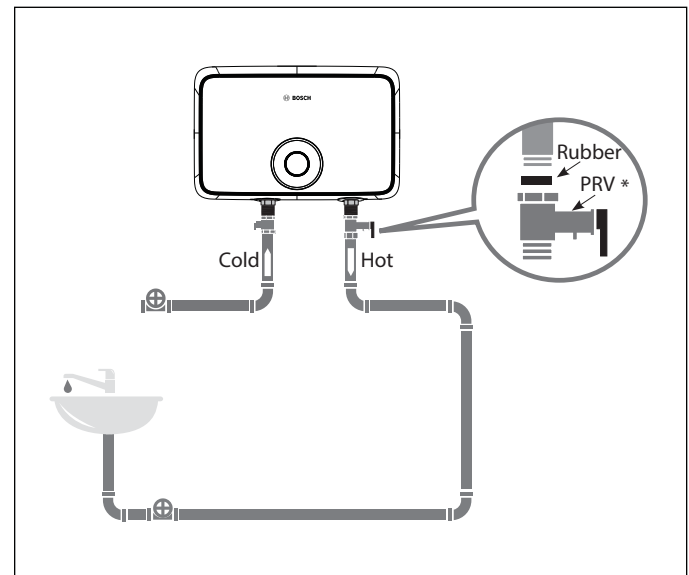


Figure 9



DANGER: PERSONAL INJURY, PROPERTY DAMAGE, PRODUCT DAMAGE

- ▶ Do not thread a cap or plug into a relief valve or relief valve line under any circumstances! Explosion and property damage, serious injury, or death may result.

National Plumbing Codes require a drain pan for any water heater installation. Failure to install one is the sole responsibility of owner and/or installer. Reference UPC 2000 (Uniform Plumbing Code) Section 510 - Protection from Damage or IPC 200 (International Plumbing code) Section 504 - Safety Devices.

7.2.2 Check Valve

The pre-installed check valve is a secondary safety device to prevent inlet pressure exceeding 123 PSI and back-flow of water in case of a water outage. Please do not remove or alter it to ensure safe operation. Installer must add drainage to the port according to National Plumbing Code.

7.2.3 Installation Example



This drawing is meant to demonstrate system piping only.

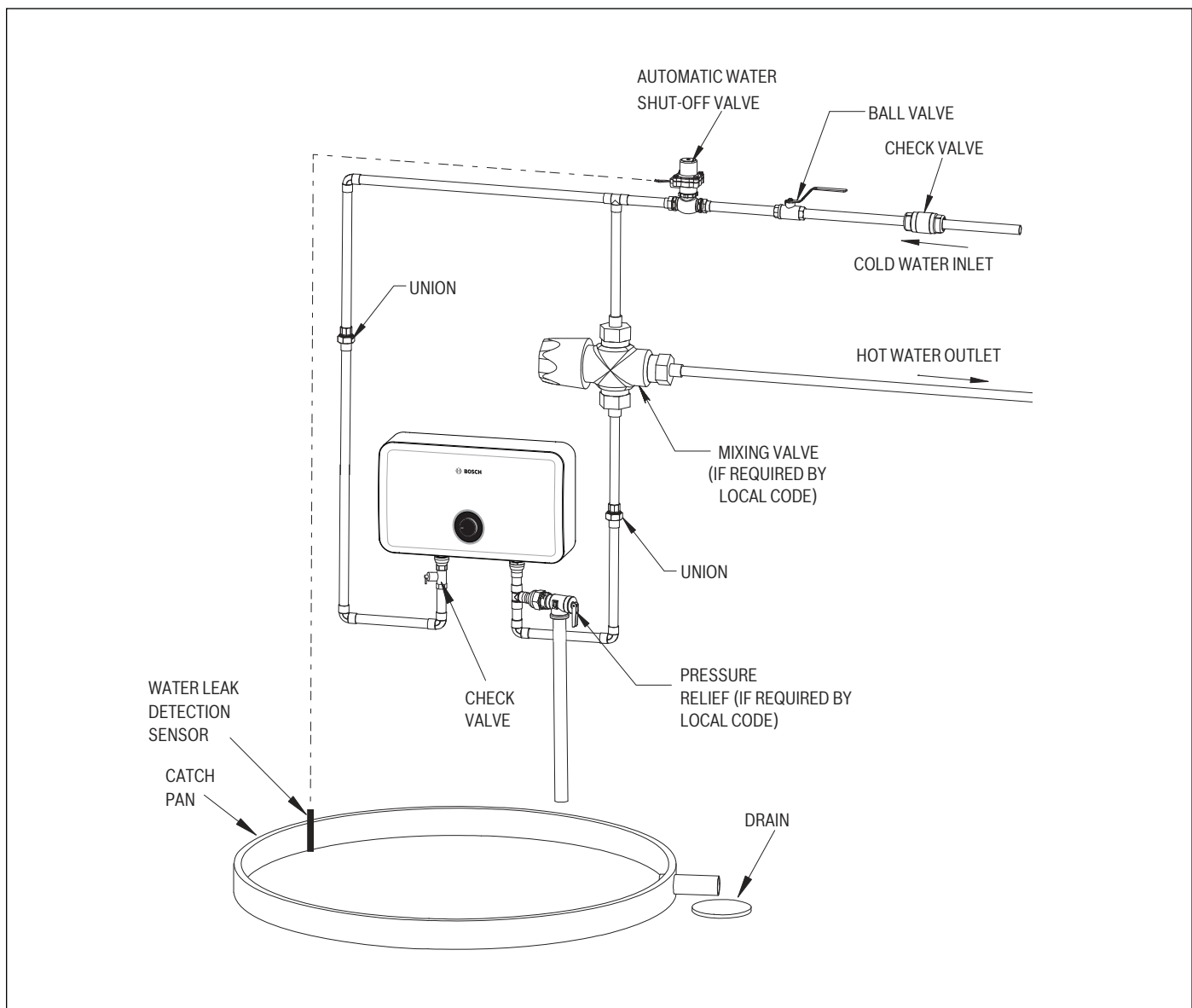


Figure 10

7.3 Filling the Heater

1. Make certain any drain valves in the system are completely closed.
2. Open the shut-off valve in the cold water supply line.
3. Open the hot water faucets to allow air to vent from the heater and piping.
4. Allow sufficient time for the heater to completely fill with water.
5. Check for and repair any leaks.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ When filling the water heater, open a hot water tap to release air in the heating canister and piping. The heating canister must be full of water before the heater is turned on. Failure to ensure the water heater is full before turning it on could result in damage to the water heater and other property damages. Such damages ARE NOT covered by water heater warranty.

7.4 Electrical Connection



DANGER: HAZARDOUS VOLTAGE

- ▶ Failure to disconnect the power from the water heater before attempting to install or repair it will result in property damage, severe personal injury, or death.



WARNING: PERSONAL INJURY, PROPERTY DAMAGE

- ▶ All wiring (wire gauge) as well as circuit protection (breakers) must comply with the National Electrical Code (NEC) in the USA or the Canadian Electrical Code (CEC) in Canada, and should be done by a qualified licensed electrician or the local electric utility.



WARNING: ELECTRIC SHOCK HAZARD

- ▶ Be sure to ground the water heater. Failure to do so could result in property damage, severe personal injury, or death.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ The water heater must be full of water before the power is turned on. The heating element will be damaged if energized for even a short time while heating canister is dry. Failures due to "dry-firing" ARE NOT covered by warranty.



This water heater must be hard wired to the correct breaker size with the appropriate wire gauge.

1. Make sure power to the unit is shut off by means of the dedicated circuit breakers on the main electrical panel.
2. Connect the appropriate AWG wire power cable for the model water heater to the terminal block.

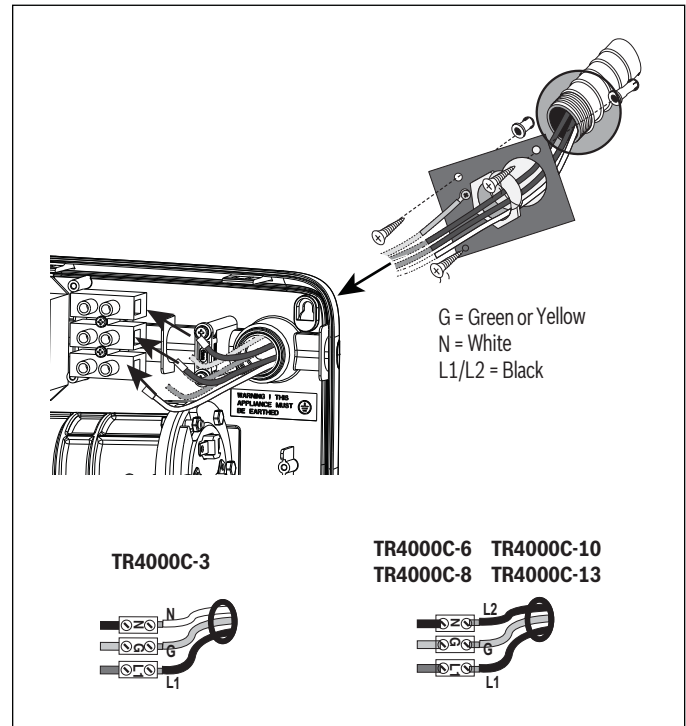


Figure 11

3. Make secure, appropriate wiring connections to the water heater per the National Electric Code.
4. The unit must be grounded.
5. Secure the water heater cover once wiring connections have been made.
6. When the water heater is not within sight of the electrical circuit breakers, a circuit breaker lockout or additional local means of disconnection for all non-grounded conductors must be provided that is within sight of the appliance (Ref. NEC 422.31).



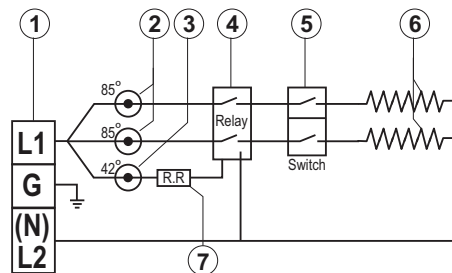
It is recommended that the water heater electrical connections be tested once a year by a qualified technician.

7. After wiring is complete, replace and secure the front cover of the water heater.

7.4.1 Wiring Diagrams

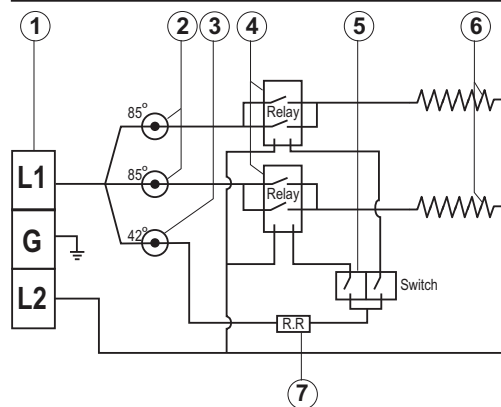
1. TR4000C-3 (120V) - Install Line 1 (L1), Ground (G), Neutral (N)

2. TR4000C-6 (240V) - Install Line 1 (L1), Ground (G), Line 2 (L2)



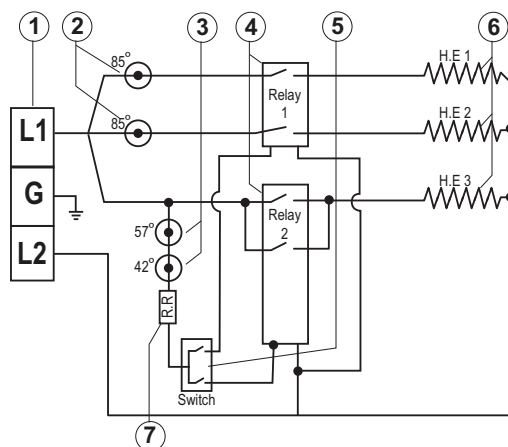
1. Terminal block
2. Thermal Cutout (Manual Reset)
3. Thermal Cutout (Auto Reset)
4. Relay
5. Switch
 - 0- Off
 - 1- Low
 - 2- Medium
 - 3- High
6. Heating element
7. Flow sensor

TR4000C-8 (240V)



1. Terminal block
2. Thermal Cutout (Manual Reset)
3. Thermal Cutout (Auto Reset)
4. Relay
5. Switch
 - 0- Off
 - 1- Low
 - 2- Medium
 - 3- High
6. Heating element
7. Flow sensor

TR4000C-10 (240V) , TR4000C-13 (240V)



1. Terminal block
2. Thermal Cutout (Manual Reset)
3. Thermal Cutout (Auto Reset)
4. Relay
5. Switch
 - 0- Off
 - 1- Low
 - 2- Medium
 - 3- High
6. Heating element
7. Flow sensor

Figure 12

8 Installation Checklist

Water Heater Location	Yes	No
Close to area of heated water demand?		
Indoors and protected from freezing temperatures?		
Area free of flammable vapors / combustibles?		
Provisions made to protect area from water damage?		
Sufficient room to service heater?		
Relief Valve	Yes	No
Pressure Relief Valve properly installed and discharge line run to open drain?		
Discharge line protected from freezing?		
Wiring	Yes	No
Power supply voltage agrees with water heater rating plate?		
Branch circuit wire and circuit breakers of proper size?		
Electrical connections tight and unit properly grounded?		
Water Supply	Yes	No
Water heater completely filled with water BEFORE operating the unit?		
Air purged from water heater and piping?		
Water connections tight and free of leaks?		

Table 6

9 Operation

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- ▶ The water heater must be full of water before the power is turned on. The heating element will be damaged if energized for even a short time while heating canister is dry. Failures due to “dry-firing” ARE NOT covered by warranty.

Wattage (kW)	Estimated Thermostat Power Setting (kW)		
	Low	Medium	High
3	1.1	2	3.1
6.5	3	3.5	6.5
8.5	3.8	4.7	8.5
10.5	5.25	5.25	10.5
13	4.5	8.5	13

Table 7 Model Operation Guide (by kW)

9.1 Water Temperature Adjustment

1. Supply power to the water heater by turning on the circuit breaker.
2. Turn the temperature dial from off to low.
3. Flow only hot water at the desired outlet. Allow the water heater several minutes to heat the water to temperature. The LED on the power selector shows the unit is heating.
4. Use a thermometer to measure the water temperature at the hot water outlet. Temperature can range from 90°F -170°F depending on flow and inlet temperature.
5. Turn the power selector knob to choose a power level setting (low, med, high) that provides the desired hot water temperature.
 - ▶ Turn the knob clockwise to increase temperature.
 - ▶ Turn the knob counterclockwise to decrease temperature.

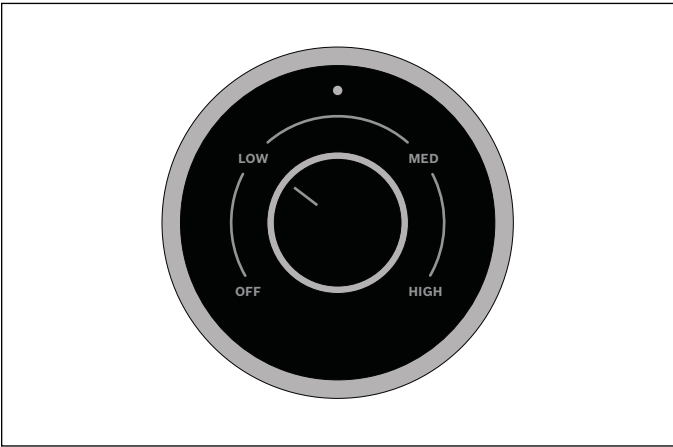


Figure 13

The recommended power setting is medium.



WARNING: SCALD HAZARD

- ▶ Households with small children, disabled, or elderly persons may require a lower temperature setting.



A lower setting is more economical and reduces the risk of scalding.

10 Seasonal Operation

Vacation/Freezing Temperatures

Drain the piping to the water heater (refer to Page 19) and leave the drain valve open if the water heater is left idle for 30 days or longer and/or is subjected to freezing temperatures while shut off.

11 Maintenance



WARNING: PERSONAL INJURY, PROPERTY DAMAGE

- Do not attempt to repair this water heater yourself. Call a qualified service technician for assistance. Always turn off the power supply to the heater prior to servicing or draining the heater. Failure to do so could result in property damage, severe personal injury, or death.



WARNING: ELECTRICAL HAZARD

- For all of these operations, the power must be turned off at the circuit breaker and the front cover removed.



For most of these maintenance operations, the water will have to be drained from the heater.

11.1 Removing the Cover

1. Remove 2 screws located on the bottom of the cover and remove.

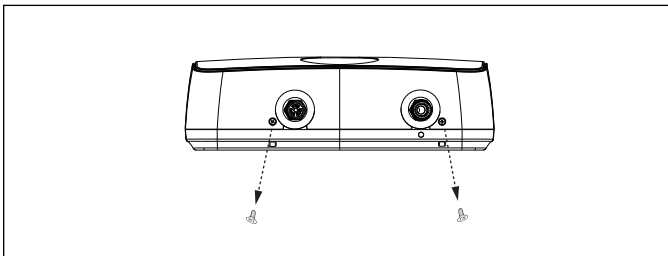


Figure 14

NOTICE: PRODUCT DAMAGE!

- **BEFORE PROCEEDING TO THE NEXT STEP**, it is important to know there is a wiring harness connected to the backside of the front cover. This must be disconnected to fully remove the cover. **DO NOT** pull cover out and away completely without disconnecting wiring first or damage may occur.

2. Pull bottom of cover forward and swing out (pos.1). Lift away from tabs on the top of the back cover (pos.2). Do not fully remove cover.

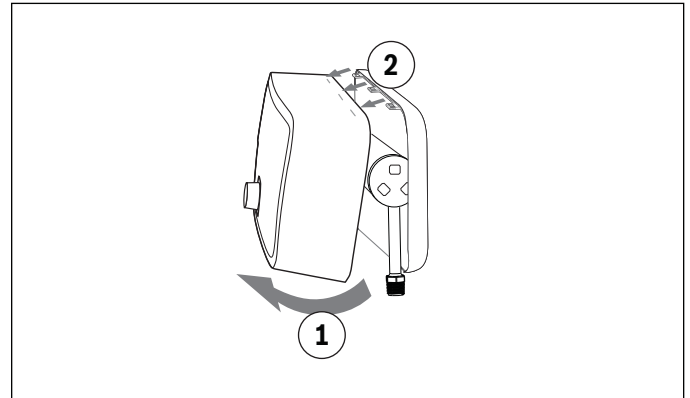


Figure 15

3. Disconnect wiring harness connected to the inside of the front cover.

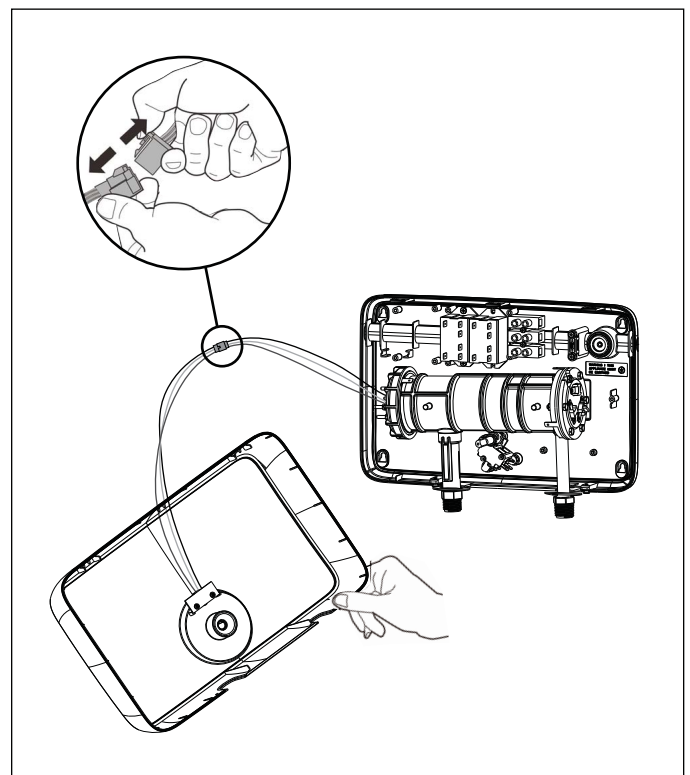


Figure 16

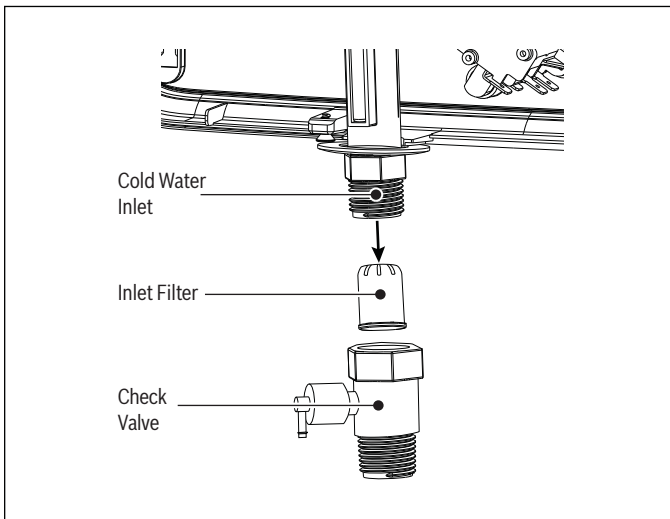
4. Remove cover completely.

11.2 Draining the Heater

1. If the heater has been installed with a drain valve, turn the water heater inlet off . Open a faucet. Then open the drain valve to drain the heater.

11.3 Checking the Inlet Filter

1. Drain the water heater following Section 11.2.
2. Remove the check valve attached to the cold water inlet.
3. Use pliers to pull the filter down and out of the cold water inlet pipe.



4. Flush filter with water until clear.
5. Reinsert filter in cold water inlet and attach check valve.
6. Reconnect plumbing, turn on power, and check for proper operation.

11.4 Removing a Heating Element

1. Drain water heater following Section 11.2 and remove the front cover.
2. Take a photo of element wiring for reinstallation. Disconnect the wires from the element. See Figure 13.

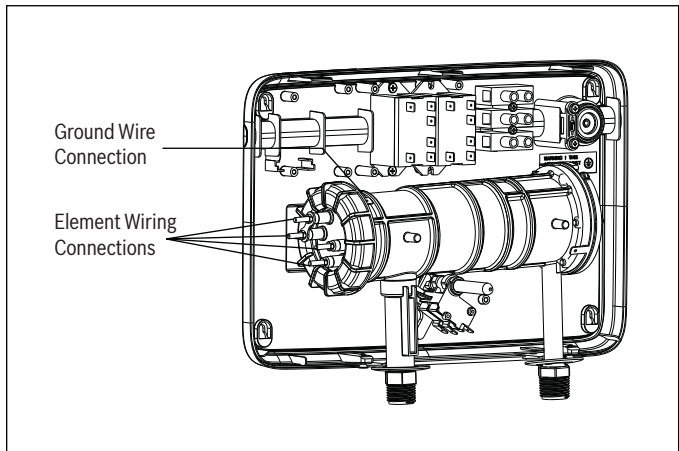


Figure 17

* Wiring not shown for clarity purposes

3. Use a pipe wrench to remove the element containing cap from the water heating assembly.

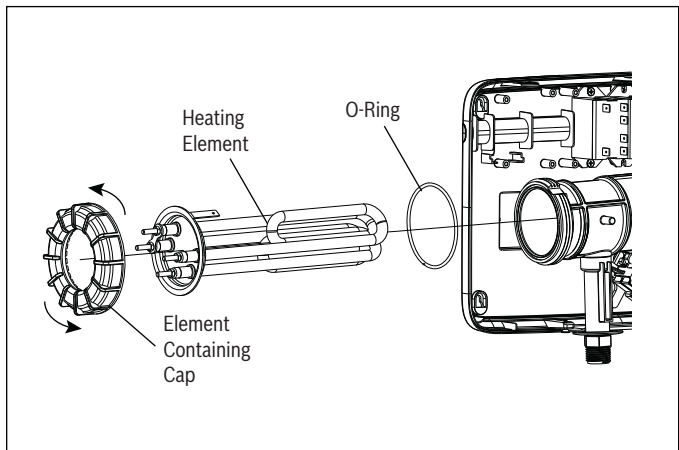


Figure 18

4. Carefully remove the heating element.
5. When reassembling, reverse the steps.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- Upon reinstallation, ensure O-ring is in good condition and properly installed before securing element containing cap.

11.5 Descaling the Heating Element

Scale deposits can affect the heating capability of the element. Heavy scale can even cause damage to the element.

NOTICE: PRODUCT DAMAGE

- Failure of electric elements due to lime scale build-up on the heating surface, low pH, or other imbalance IS NOT covered by the warranty. See Section 3.

The element can be descaled either chemically or manually.

To descale chemically:

1. Soak the element in white vinegar or other food grade descaling solution approved for use in potable water systems.
2. Once descaled, rinse well with a fresh water / baking soda solution.

To descale manually:

1. After the element has dried, use a soft brush (non-metallic to prevent damaging the element sheath) on the element.
2. Brush the dried minerals off.

Reinstall the element after descaling. Ensure the element o-ring is installed and that the element is rewired correctly.

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- The water heater must be full of water before the power is turned on. The heating element will be damaged if energized for even a short time while heating canister is dry. Failures due to "dry-firing" ARE NOT covered by warranty.

12 Troubleshooting

Before calling for service check the troubleshooting list of common issues. This can save time and cost. If you are unable to resolve a problem contact your installer or Customer Service for support.



WARNING: ELECTRICAL HAZARD

- Failure to disconnect the power from the water heater before attempting to install or repair it will result in property damage, severe personal injury, or death.

Alternatively, please visit our Service & Support webpage to find FAQs, videos, service bulletins, and more; www.boschheatingcooling.com/service or use your cellphone to scan the code below.



Problem	Possible Causes	Solution
Water Not Hot Enough	Too much water flowing through the heater	Reduce the flow rate at the faucet or slightly close the shutoff valve on the unit's incoming water supply line to reduce flow
	Temperature setting is too low	Increase the temperature setting on the unit, see Section 9
	Water pressure less than 7 psi (0.5 bar)	Make sure the shutoff valve is fully open and the water supply line is not blocked
	Heating element failure	Test element continuity, see Section 12.2.
	Electrical malfunction	Contact a qualified electrician or your installer for service
Water Too Hot	Not enough water flowing through the heater	Increase the flow rate at the water outlet. If flow does not increase, clean and inspect the water heater inlet filter and faucet aerators/showerheads
	Temperature setting is too high	Switch to a lower temperature setting, see Section 9
	Pre-heated water supply	Ensure the heater is connected to a cold water supply
Heater Shuts Off During Use	Power outage or faulty wiring	Check the power supply and circuit breaker. If problem persists, contact a qualified electrician
Water Stops Flowing	Blockage in water pipes or hoses	Ensure the main water shutoff valve is fully open and there are no obstructions in the water supply line
	Blockage in cold water inlet	Remove check valve and inlet filter on the cold water inlet and ensure there are no obstructions. See section 11.3
	No water supply	Ensure the main water shutoff valve is fully open and there are no obstructions in the water supply line
Water Temperature Varies from Hot to Cold During Use	Water pressure has dropped below minimum level or flow is not stable.	Increase the flow rate from the water supply source. Check for plumbing crossover or other water supply issues.
No Hot Water	Power outage or faulty wiring	Check the power supply and circuit breaker
	The flow rate needed to activate the heating element (0.55 gpm) has not been reached.	Ensure shutoff valve to the water heater is fully open. Increase the flow rate from the water supply source Clean the filter screen on the unit's cold water inlet. See section 11.3
	High Limit Has Been Tripped	Check that the high limit reset buttons are pushed in. Follow steps to reset the switch in this manual, section 12.1.
Leaks	Check for leaks at fittings	Check water fittings. Remove front cover and inspect heating element gasket
	If tank is leaking	Turn off water supply at the shutoff valve. Shut off power to the water heater, and review warranty to see if heater is still within warranty period

Table 8



If further assistance is needed, our technical support team is available Monday to Friday via:
Email: www.boschheatingcooling.com/contact
Phone: 1-866-642-3198



WARNING: SCALD HAZARD

- The risk of scald injury increases as you increase water temperature. A lower setting is more economical and reduces the risk of scalding. Use a water tempering or mixing valve and extreme caution when using hot water to avoid scald injury. Consult codes for conformance. Failure to follow the instructions in this warning statement could result in serious personal injury or death from scalds.

NOTICE: PRODUCT DAMAGE

- If draining of the water heater is necessary, open the T&P valve or a hot water tap to prevent vacuum buildup in the tank and piping.

12.1 Thermal Cutout

Occasionally, the thermal cutouts may trip, resulting in power being shut down as a safety precaution. This can happen if the water temperature exceeds a certain temperature.

If a thermal cutout continues to trip, the power setting might be too high or the flow too low. Adjust the power selector and/or the flow.

For the water heater to be put back into operation, the tripped thermal cutout will need to be reset. The reset method will depend on which type of switch as tripped:

1. Shut off the circuit breaker and remove the front cover.



WARNING: ELECTRICAL HAZARD

- Failure to disconnect the power from the water heater before attempting to install or repair it will result in property damage, severe personal injury, or death.

2. If the thermal cutout has a button in the center of it; This is a manual thermal cutout.

To reset, press the reset button. If you hear a click, then this thermal cutout was tripped and you have now reset it. Turn the circuit breakers back on and run a hot water faucet to test that the water heater activates.

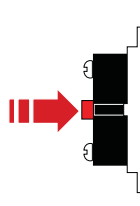


Figure 19

3. If the thermal cutout has NO button on it; this is a thermal cutout with an automatic-reset function. Once the overheat condition has ended, this type of thermal cutout will reset itself. Open the hot water faucet and allow about one minute for the cutout to reset. If the thermal cutout has not reset itself, it may be necessary to test it for failure.
4. To test a thermal cutout for failure, please do the following:
 - a. First, ensure that all circuit breakers that supply the water heater are turned OFF.
 - b. Use a multimeter to test for continuity across the cooled thermal cutout. If you have continuity, the switch has reset and power will flow across it. If you have no continuity across the thermal cutout and it is cool to the touch, it may have failed and will require replacement.

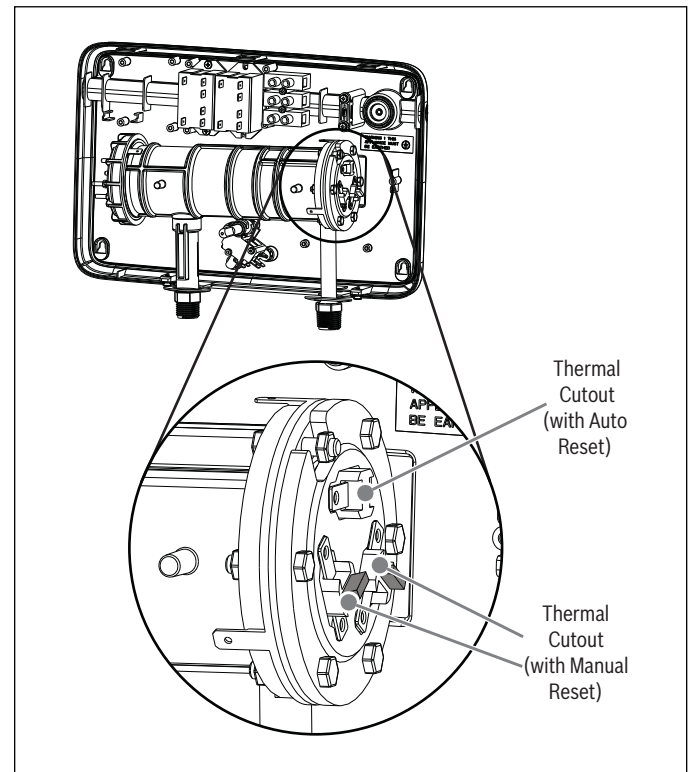


Figure 20 Reset Locations



CAUTION: PRODUCT DAMAGE, PROPERTY DAMAGE

- Call a technician if the high limit needs to be reset frequently.

12.2 Testing the Heating Elements



WARNING: ELECTRICAL HAZARD

- Before performing the following, the power must be turned off at the circuit breaker and the front cover removed.

1. Using a multi-meter, test elements for continuity at the locations below.

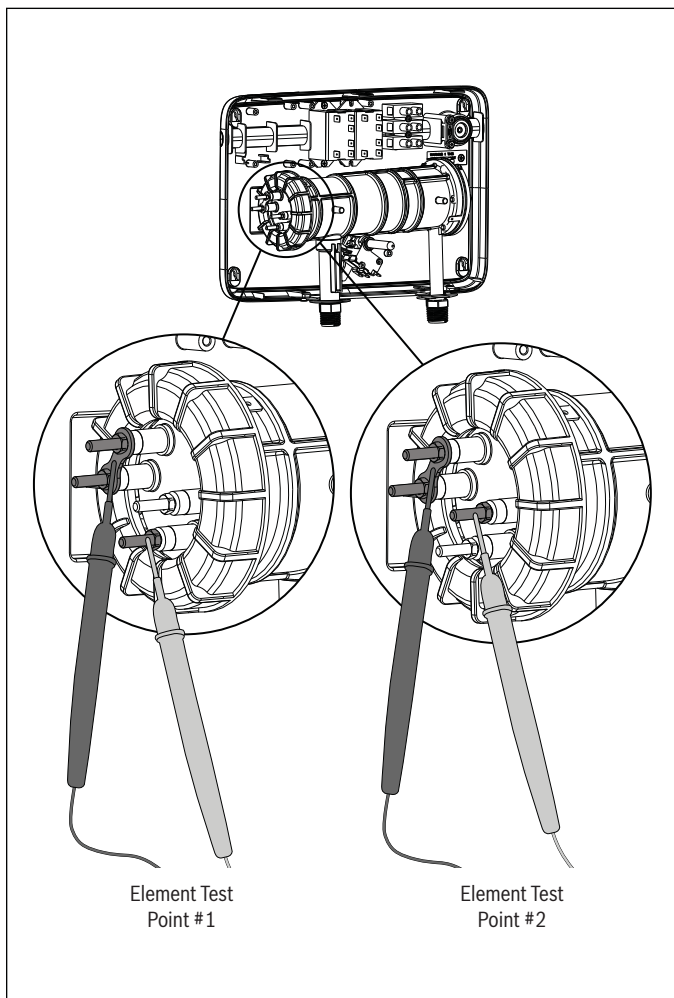


Figure 21

2. If either of the elements show no continuity, they have likely failed and either the unit or element should be replaced.

NOTES:

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www.bosch-thermotechnology.us**

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engineering and technological advances.**