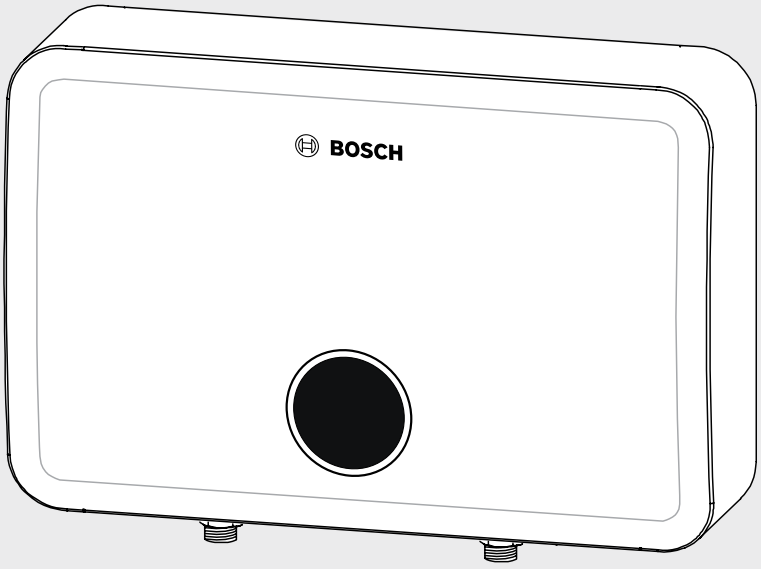
BOSCH

Installation Manual

Electric Tankless Water Heaters

TRONIC 6100 C

TR6100C-18 | TR6100C-27



⚠ 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. This heater has more than one power supply connection point. Never attempt to install, clean, inspect or repair, disassemble, or service the heater without first shutting off all power to the unit by means of the circuit breaker on the main electrical panel.
6. Power supply wires must be rated to 194 F (90C). Refer to technical specifications section 6 table 4 for proper wire size.
7. The heater must be connected to a 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 non-grounded conductors must be provided that is within sight of the appliance. (Ref NEC 422.31.).
8. The plumbing installation must be completed before the electrical installation.
9. The plumbing installation requires non-ferreous metal pipes or reinforced stainless steel water heater connectors that can withstand pressure up to 150 psi.
10. To ensure proper operation, the water supply flow rate must be at least 0.5 gpm.
11. Do not install the heater where it may be subjected to direct sunlight, rain, splashing water, or freezing temperatures.
12. Before connecting the unit to a public power network, consult the local power supply authority to ensure the power network meets the stated requirements.
13. 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.
14. 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,ordinances and the latest version of the National Electrical Code, NFPA No. 70.

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: INDOOR INSTALLATION ONLY

- DO NOT INSTALL OUTDOORS.This water heater is certified for indoor installation only and 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: FIRE

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

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.**

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.

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:

- 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.

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.

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.

Water Temperature Adjustment

The water heater thermostat has been pre-set at the factory at a temperature equal to 125°F (52°C). Follow local codes and if the water heater is going to have a set temperature above 120°F, install an ASSE 1017 rated mixing valve to avoid severe burns or death from scalding temperatures.

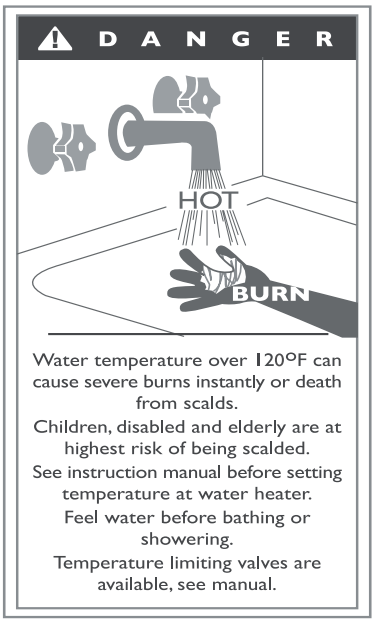
After adjusting the water temperature at the thermostat, allow the water heater enough time to heat the water to temperature. The recommended temperature setting is 120°F.

WARNING: SCALD HAZARD

- Scald injury is heightened by increased water temperatures. Hot water can produce 3rd degree burns in less than 5 seconds at 140°F and in approximately 30 seconds at 130°F.
- If the Water Heater thermostat is set too high there is Serious Potential for SCALDING.
- Children, the disabled and the elderly are at highest risk of being scalded.

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



2 Prepare the Water Heater

2.1 Inspect Shipment

Inspect shipment for possible damage. The manufacturer's responsibility ceases upon delivery of goods to the shipper in good condition. Any claims for damage, shortage in shipments, or no delivery must be filed immediately against carrier by consignee.

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.

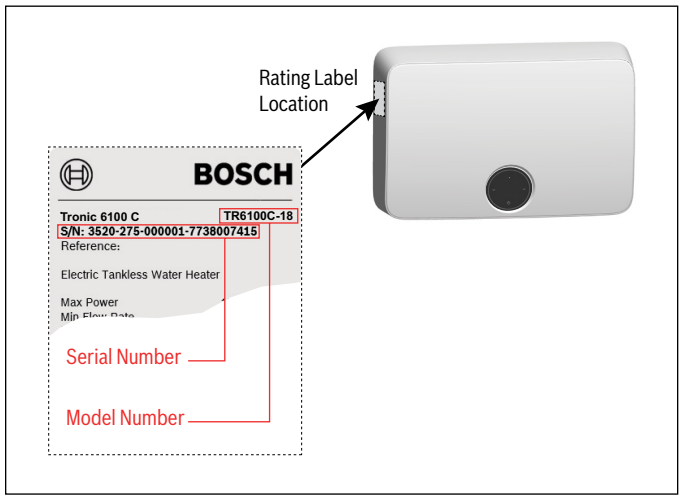


Figure 1

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 removable panel is acceptable to provide front clearance.

This water heater is 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.

WARNING: FIRE, EXPLOSION

- Please keep any flammable materials at least 24" (61cm) away from the water heater and hot outlet pipe.

NOTICE: PRODUCT DAMAGE

- 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: 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.

NOTICE: PROPERTY DAMAGE

- All water heaters eventually leak. Locate the water heater where any leakage from the relief valve, related piping, tank, 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 (Mechanical Room) Operating Conditions

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

WARNING: IMPROPER OR DANGEROUS OPERATION

- DO NOT attempt to install this water heater in any other orientation than in a upright, vertical position and on a level surface (see Fig. 5). 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

- Incorrect 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 information.

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 are 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 Centralized Location

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

To save on heating costs and improve energy efficiency keep the distance between the water heater and fixtures to a minimum to reduce heat loss from excess piping and keep friction loss at a minimum. Ensure all water heater piping is properly insulated to minimize heat loss.

In the State of California, the water heater must be braced, anchored, or strapped to avoid moving during an earthquake. Contact local utilities for code requirements in your area. Visit http://www.dsa.dgs.ca.gov or call 1-916-445-8100 and request instructions.

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.

2.4.3 Replacing an Existing Water Heater

If the water heater is to replace an existing water heater, check for and correct any existing system problems such as:

- System leaks
- Location that could cause the system and water heater to freeze and leak

3 Water Quality Requirements

CAUTION: PROPERTY DAMAGE, PRODUCT DAMAGE

- Chemical composition 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 contaminates, 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 CO2	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.

4 Water Heater Components

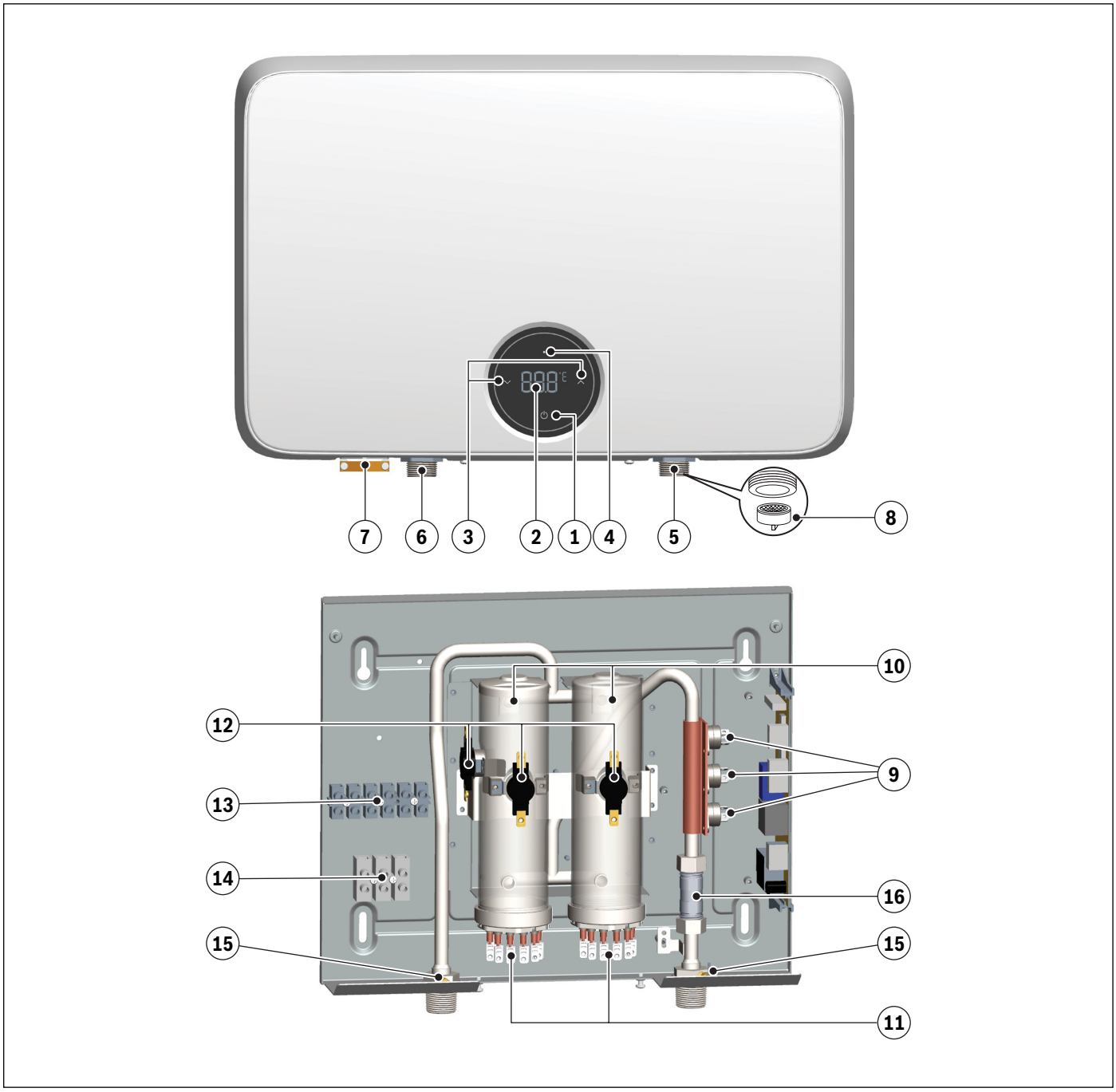


Figure 2 Water Heater Components

1 Power Button
2 Digital Temperature Display
3 Temperature Setting Buttons
4 LED Indicator
5 Cold Water Intlet
6 Hot Water Outlet
7 Electrical Knockout/Strain Relief
8 Inlet Water Filter
9 Triac
10 Heating Canister
11 Heating Element
12 High Limit Switch
13 Terminal Block
14 Ground Connection
15 Thermistor
16 Flow Switch

5 Dimensions

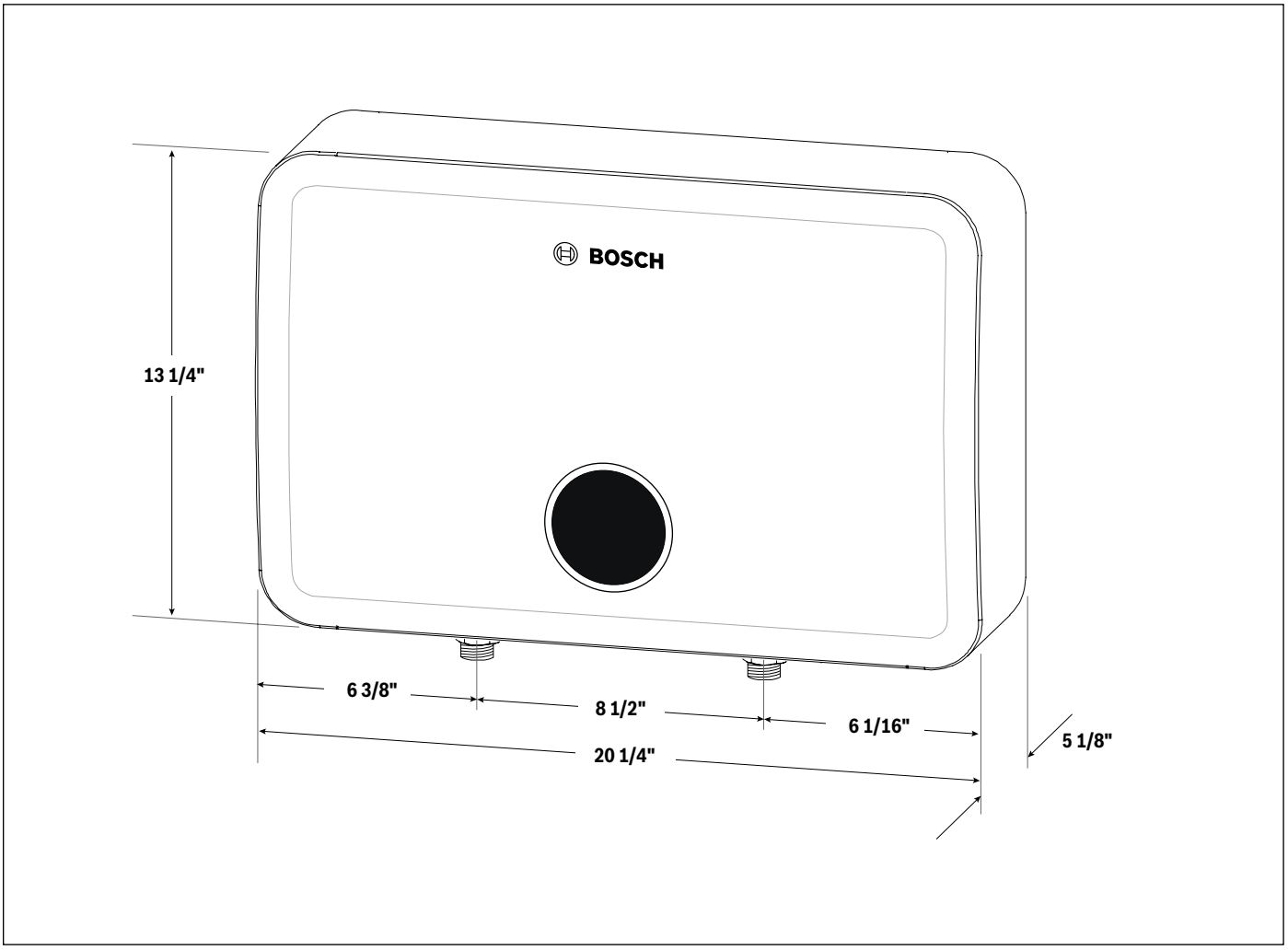


Figure 3 Dimensions

6 Technical Specifications

Description		TR6100C-18	TR6100C-27
Wattage (kW)*	240V	18	27
	208V	13.5	20
Max Amperage	240V	75	112.5
	208V	65	96
Required Breaker(s)	208V/240V	3 x 30A Double Pole	3 x 40A Double Pole
Required Wire Size	208V/240V	3 x 10 AWG w/Ground	3 x 8 AWG w/Ground
Minimum Water Flow to Activate		0.5 gpm	
Working Pressure		7 - 150 psi (0.5 - 10 bar)	
Tested Pressure		290 psi (20 bar)	
Water Connections		3/4" NPT	
Heating Canisters with Internal Elements		2	
Weight		12.2 lb (5.5 kg)	
Temperature Range		86 - 125°F (30 - 52°C)	

Table 4

** Performance will reduce if voltage reduces*

Temperature Rise Δt	Flow Rate (GPM)	
	TR6100C-18	TR6100C-27
35°F	3.51	5.26
45°F	2.73	4.09
77°F	1.59	2.39

Table 5

7 Installation

7.1 Wall Mounting the Water Heater

1. Remove the 2 screws used for shipping on the backside of the unit and recycle. They are no longer needed.

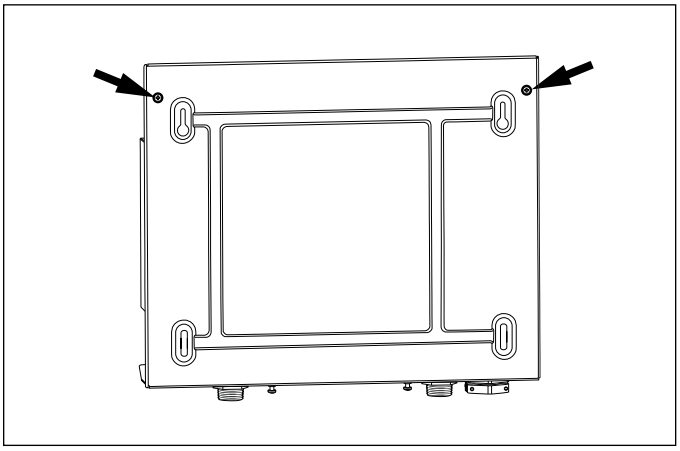


Figure 4

2. Remove 2 screws located on the bottom of the cover and save for reinstallation.

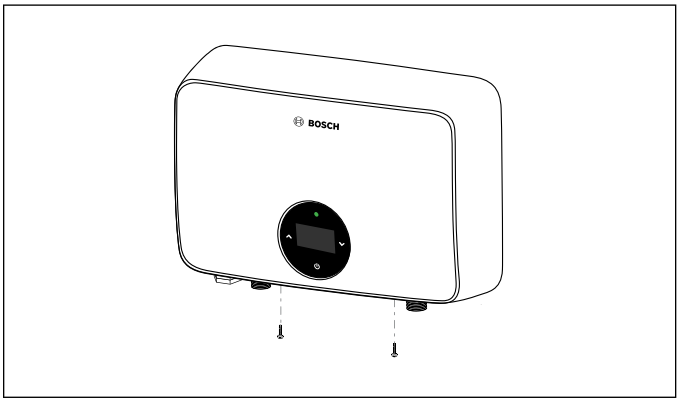


Figure 5

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.

3. 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.

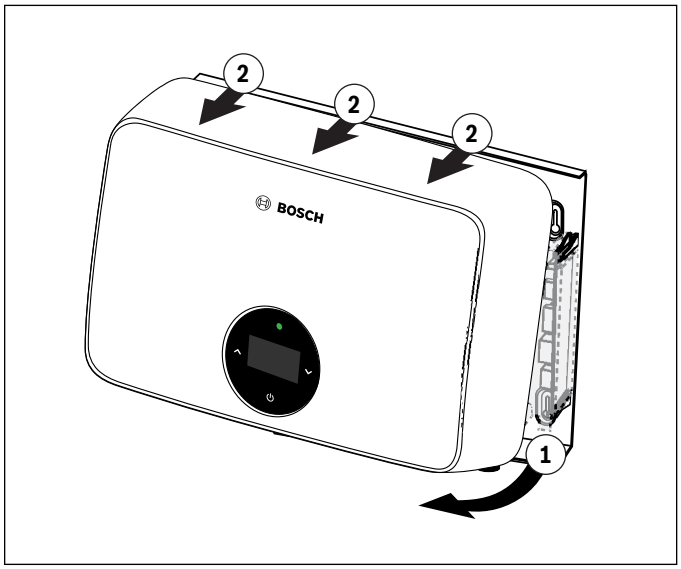


Figure 6

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

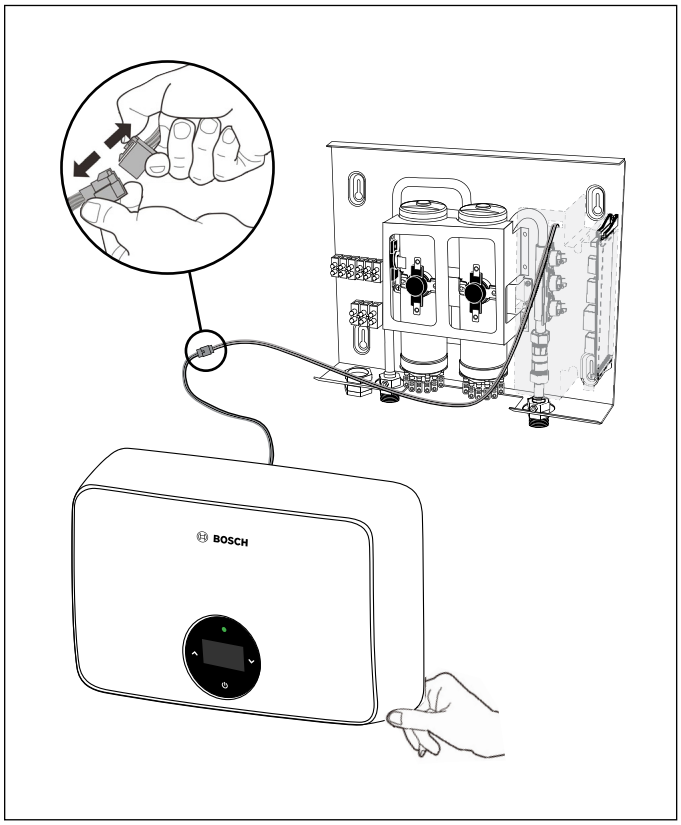


Figure 7

5. Remove cover completely.

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. The appliance must be mounted upright, with water inlets and outlets at the bottom. See Figure 8.

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.

Figure 8

8. Position the unit on the mounting surface. Ensure the unit is plumb.
9. Mount the unit to the wall with four (4) screws of at least one (1) inch (25.4mm) in length at the marked points. See Figure 9.

Mounting screws not included with the product.

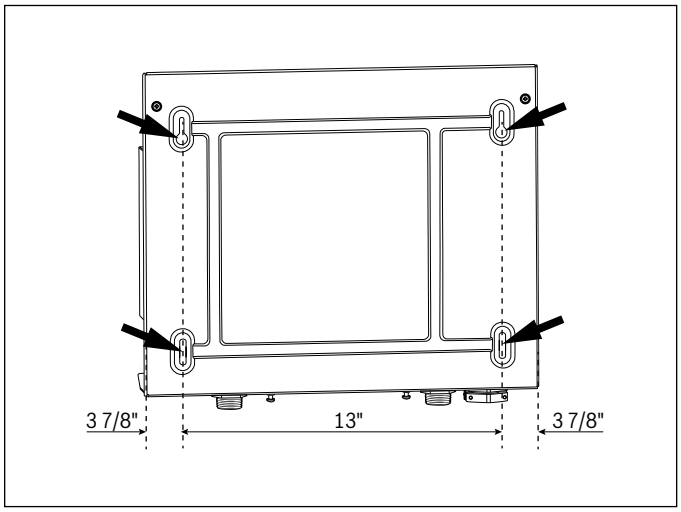


Figure 9

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.

10. 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 federal, local, and state plumbing codes and practices. Failure to properly install the water heater WILL VOID the warranty. It is also best practice to use thread tape on all mechanical plumbing connections.

- Minimum pipe size should match water heater connection.
- 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.
- Do not use plastic or PEX type piping within 3 feet on either side of heater.
- **All water pipes within three (3) feet of the unit's water inlet and outlet must be rated for high temperature applications of 185°F (85°C) minimum.**

Do not apply thread tape on the first two threads. Keep clear to prevent materials entering the water path.

1. Install unions on the hot and cold water connections to easily disconnect the water heater for servicing. See Figure 10.

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 (right 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 solder any piping to the unit's connection points.
- 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. Use two wrenches when tightening water piping at heater. Use one wrench to prevent the heater inlet or outlet line from turning. Take care not to over tighten. Damages due to improper installation practices ARE NOT covered by warranty.

The maximum operating water pressure of this water heater is 150 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.

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.

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.

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).

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.

7.3 Installation Example

This drawing is meant to demonstrate system piping only.

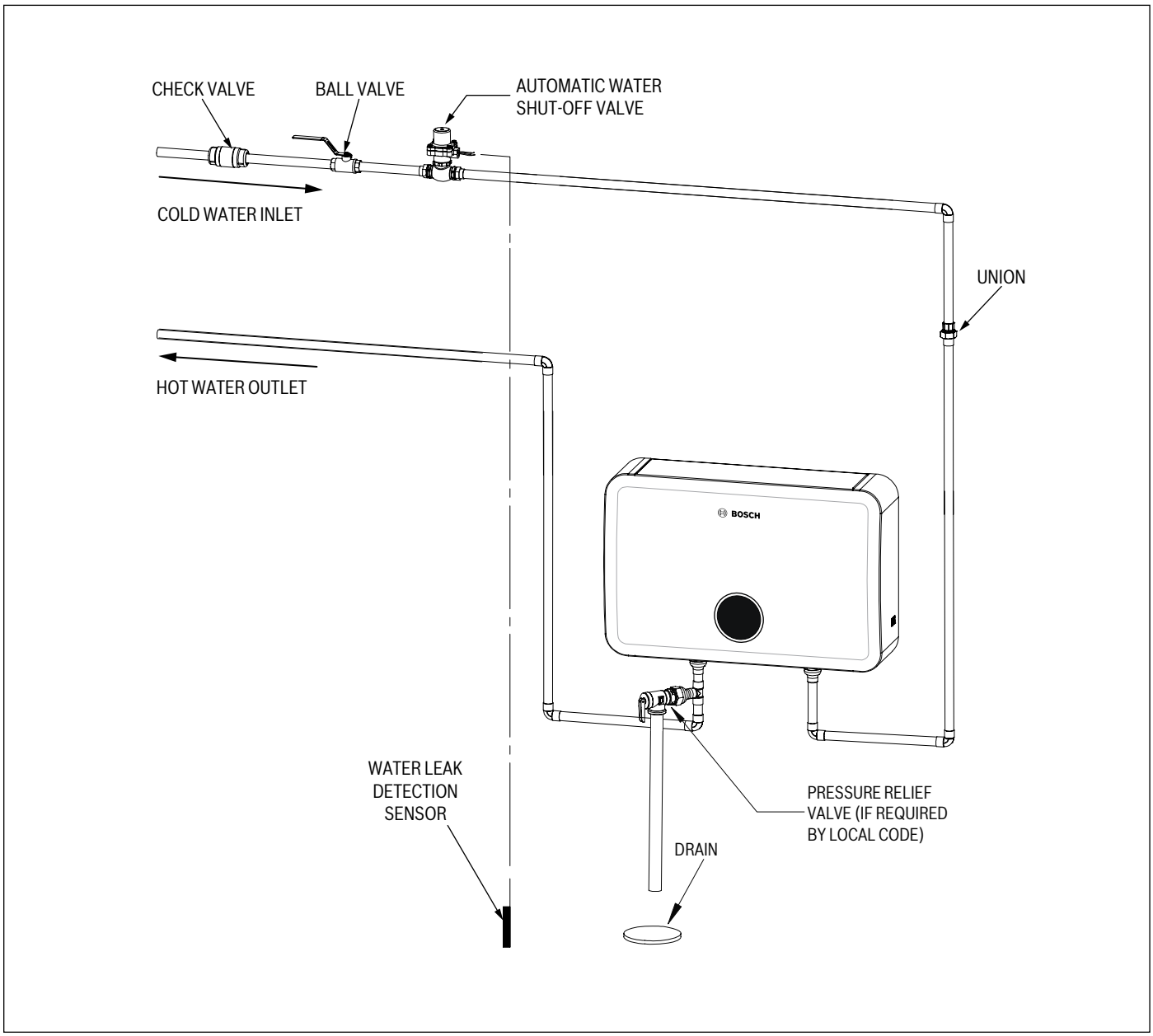


Figure 10

7.5 Scalding

WARNING: SCALD HAZARD

- 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.

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 thermostat on this heater to obtain the increased water temperature required by these appliances you may create the potential for scald injury.

To protect against injury, install a mixing valve in the water system. This valve will reduce point of use discharge temperatures by mixing cold and hot water in branch supply lines. Such valves are available from your local plumbing supplier.

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.

7.6 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.

If you detect a water leak from the water heater at this point, turn off the water supply at the main shut-off valve and contact Customer Service (Phone: 1-866-642-3198).

NOTICE: PRODUCT DAMAGE, PROPERTY DAMAGE

- When filling the water heater, open a hot water tap to release air in the water heater and piping. The heating canisters 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.

7.7 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 and 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 installed in accordance with all applicable local, state, provincial, and national electrical codes.

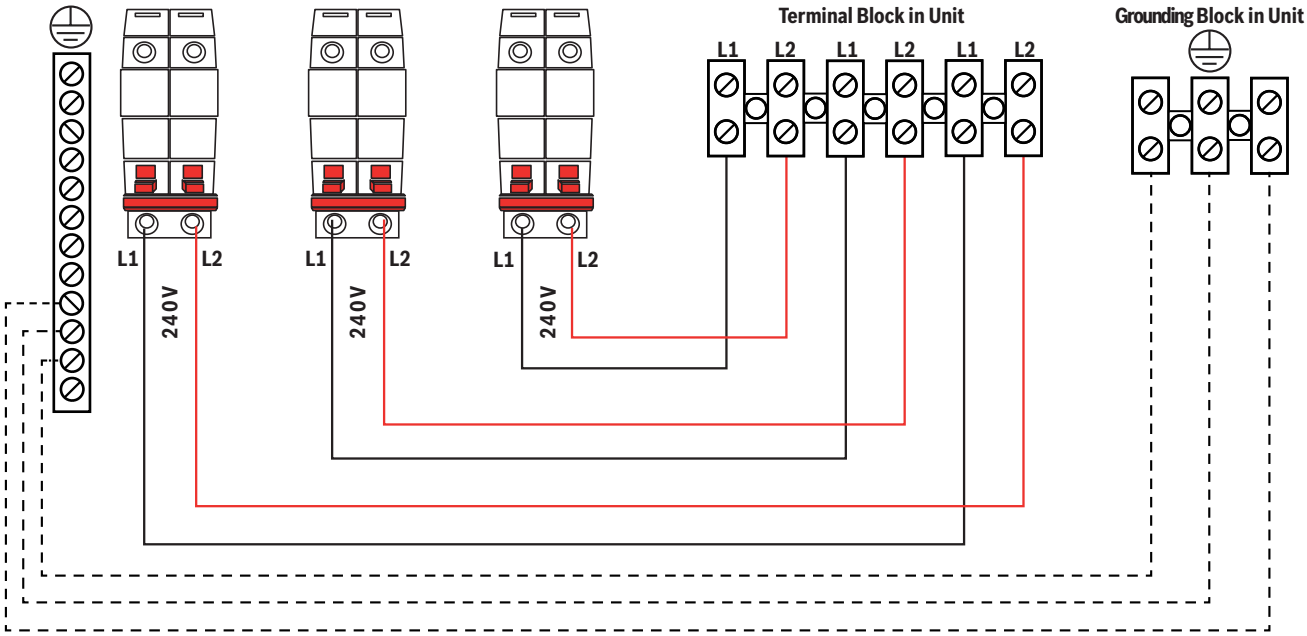
The heater must be connected to dedicated circuit breakers.

18 - 27kW models require 3 sets of wires and ground. See Wiring Diagrams for additional information.

1. Take each wire pair and connect them to one breaker (see Wiring Diagrams). Ensure that each breaker is connected to one black wire and one red or white wire. Ensure the power to the unit is shut off by means of the dedicated circuit breakers in the main electrical panel.
2. A suitable wire gauge which meets all applicable electrical codes for the size of the breakers should be used. The correct set of power cable wires should be run from the circuit breakers in the main electrical panel to the water heater. Connect the power cable to the terminal block within the water heater.
3. Each incoming circuit requires a separate ground connector.
4. DOUBLE CHECK the electrical connections to ensure their correctness as well as the tightness and secureness of wire connections. Its important to confirm that the correct breaker size and wire gauge has been used and that the unit has been connected to a ground in accordance with applicable codes.
   - Ensure that all connections are correctly made to ensure proper operation of the unit. It is critical that the unit be wired as shown. Mixing up one set of wires with another will result in the failure of the unit to operate correctly even though it turns on and otherwise appears to function properly.
5. The front cover of the unit should be replaced and reattached with two (2) screws.
6. Ensure that all the air has been purged from the water lines before turning on power to the unit. Kindly check STEP 3 in the plumbing installation section. Restore power to the unit by means of the dedicated circuit breakers in the main electrical panel.

7.8 Wiring Diagrams

7.8.1 Power Supply Wiring for 18 and 27kW



Unit requires 10 AWG for 18kW, 8 AWG for 27kW wire with ground - one for each 240 V circuit.

Figure 11

Voltage phasing is important. The voltage between each L1 should be less than 5V.

Internal PCB Dip Switches

NOTICE: PRODUCT DAMAGE

- Do not alter or change the position of dip switches to ensure correct operation.

7.8.2 Internal Wiring Diagram for 18kW

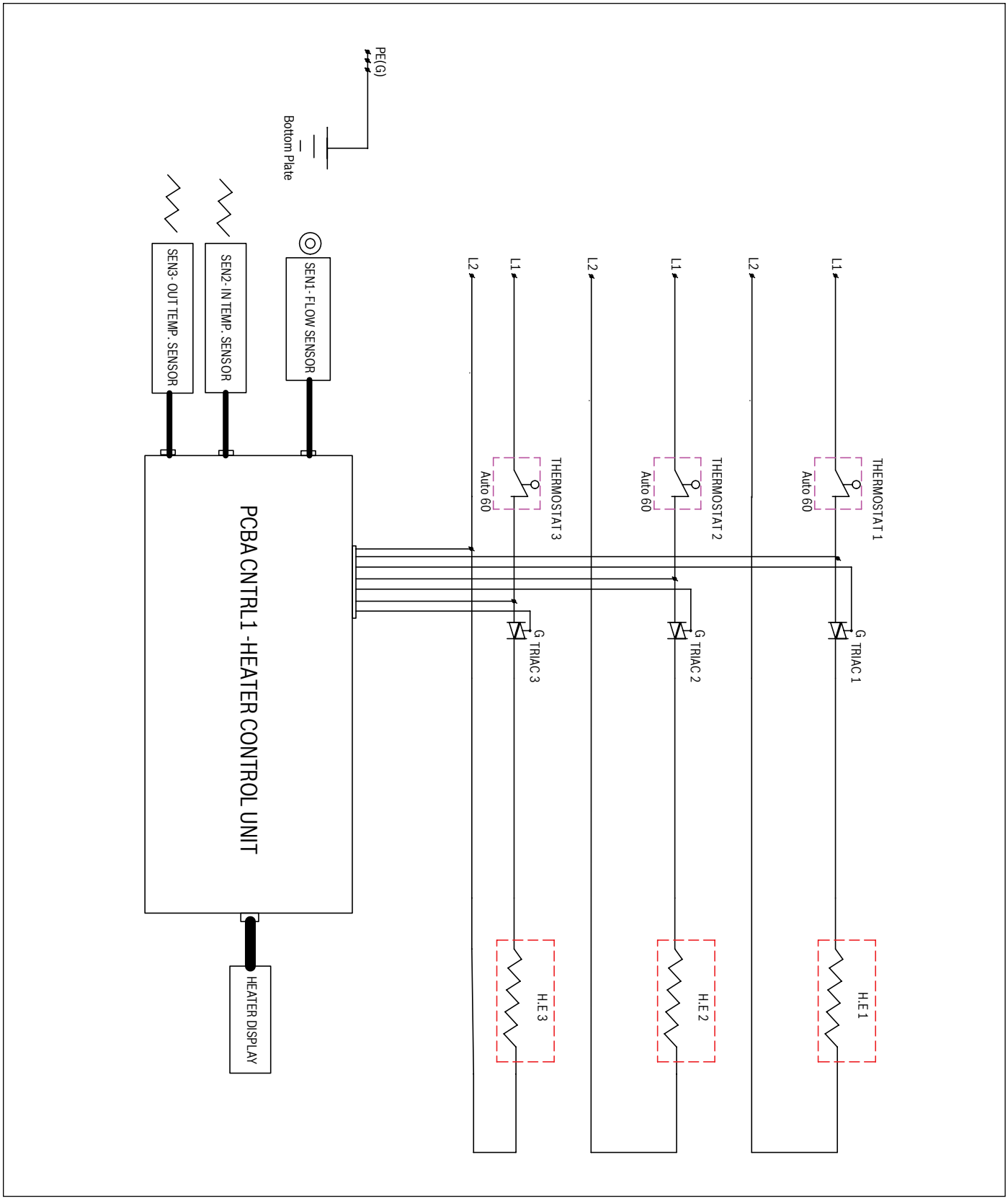


Figure 12

7.8.3 Internal Wiring Diagram for 27kW

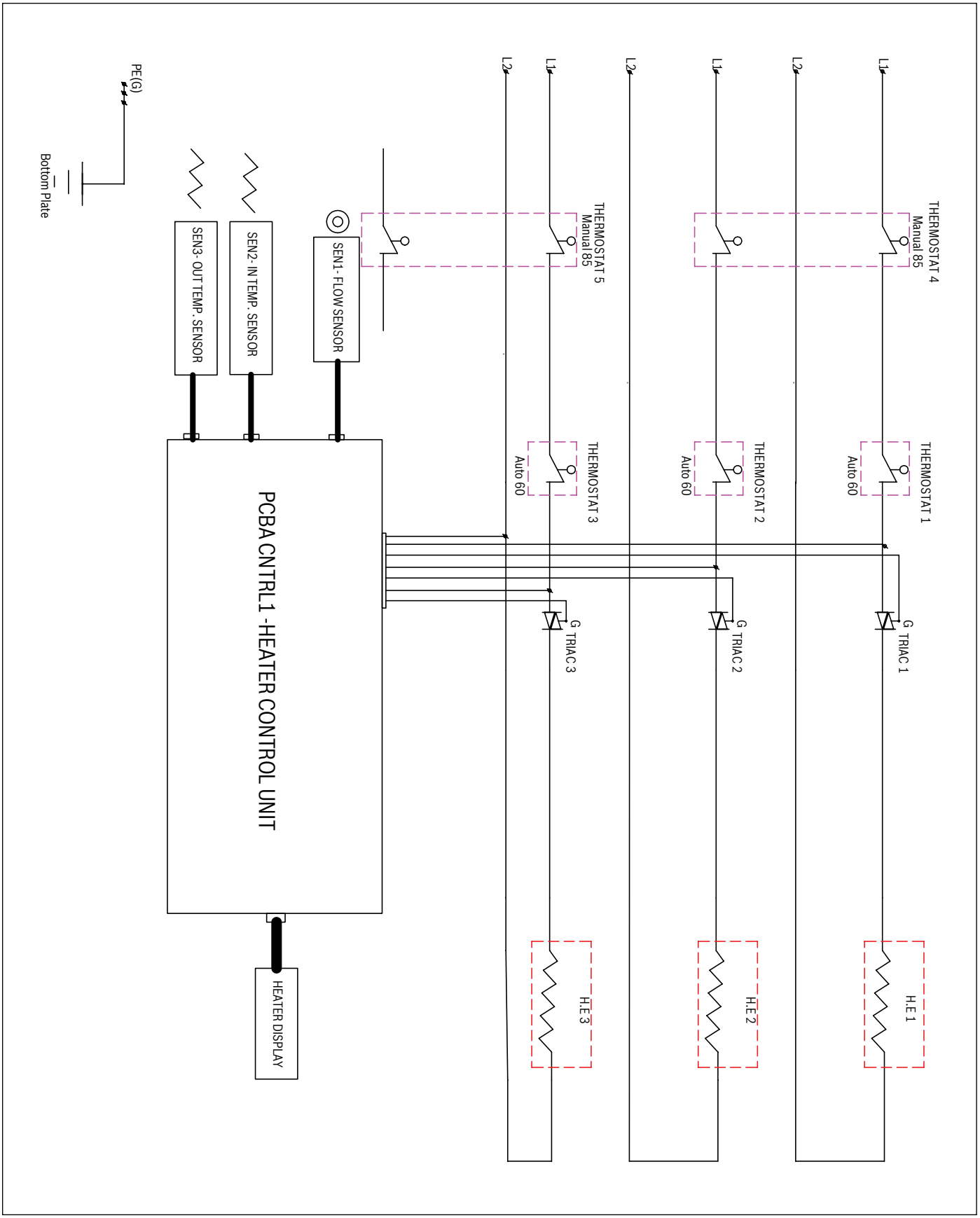


Figure 13

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 (If required by local, state, or provincial codes)	**Yes**	**No**
Temperature and 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 fusing or circuit breaker 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

This tankless electric water heater is designed to supply hot water instantaneously on demand. The unit contains heating elements capable of heating water quickly for as long as necessary.

Unlike a conventional tank storage water heater, this tankless water heater does not store hot water. A tankless system is more efficient because it does not waste energy continually heating water that is idly sitting and losing heat in a storage tank. As soon as a demand for hot water is detected the heating elements are activated.

Sensors continually monitor water flow rate and incoming and outgoing temperature and transmit data to the system controller, which determines the exact amount of power required by the heating elements to reach the set temperature.

Operating this tankless water heater is similar to using any traditional water heating system. However, it is very important to carefully read all of the setup procedures and operating instructions in this manual to ensure the maximum performance and energy savings from the water heater.

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 tank is dry. Failures due to "dry-firing" ARE NOT covered by warranty.

Display will only light up when unit is in operation or user changes set temperature.

Turning the Unit On

- Press the ⏻ button. The unit will power on.
- Press ⏻ again. The unit will turn off.

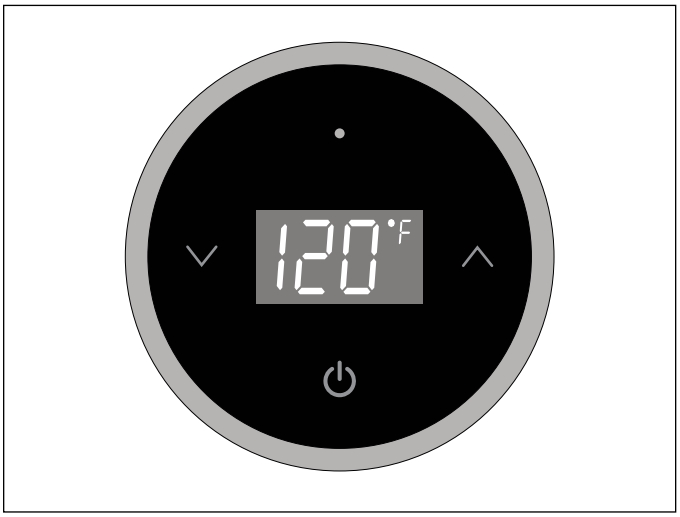


Figure 14

Switch Temperature Unit

To change between Celsius and Fahrenheit as a temperature display unit. Press and hold the ∧ and ∨ simultaneously for 3 seconds until the unit shows the change.

Setting the Outlet Water Temperature

- Press the ⏻ button to power on the unit.
- Press ∧ or ∨ to decrease or increase the temperature, respectively.
- Temperature can be set to any level from 86 - 125°F (30 - 52°C).

Setting Recommendations:

- A comfortable temperature for bathing and showering is between 105 and 110°F (41 and 43°C).
- The recommended temperature setting is 120°F (49°C), which will deliver hot water for all household needs at a maximum water flow rate.
- A higher temperature setting is not recommended, as it can cause serious scalding injuries to children and elderly persons.
- Higher temperatures also produce more scale buildup in water heating devices.

If unit is not achieving set point, reduce the flow rate. Refer to table 5.

10 Seasonal Operation

Vacation/Freezing Temperatures

Due to the configuration of the water heater, it is extremely difficult to get all of the water out of the heater.

Follow the procedure below to best minimize the chance of freeze damage:

1. Disconnect electric supply.
2. Disconnect cold and hot water pipes from fittings on bottom of heater. Allow water to drain out (have a catch basin ready).
3. Use compressed air to purge remaining water out of heating canisters.

Remember, these suggestions are only made to help minimize the potential for freeze damage and are not to be construed as the guaranteed method for dealing with freeze possibilities

The suggestions above are only made to help minimize the potential for freeze damage and **are not to be construed as the guaranteed method** for dealing with freeze possibilities.

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 should 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.

The water heater requires periodic maintenance. Proper preventative maintenance will significantly extend the life of the heater. To ensure maximum performance of the water heater and reduce the risk of a water leak:

- Periodic inspections and tests are always recommended for signs of damage or failure. Any damage, cracks, leakage, or weakness should be addressed and fixed immediately. Do not over-tighten any of the connections. Over-tightening could cause serious internal damage to the unit.
- Water heated at higher temperatures produces scale buildup much faster than at lower temperatures. Having manual shut-off/maintenance valves installed on the inlet and outlet of the water heater will allow access to the unit. It is recommended to flush the unit once a year under normal conditions or once every six months if the water supply has unusually hard water.

11.1 Removing the Cover

1. Remove 2 screws located on the bottom of the cover and save for reinstallation.

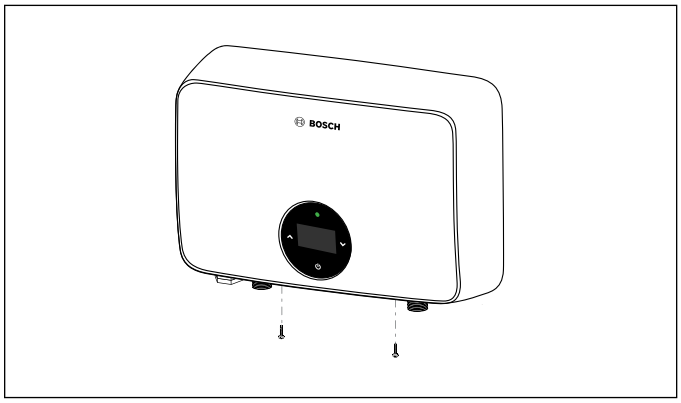


Figure 15

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.

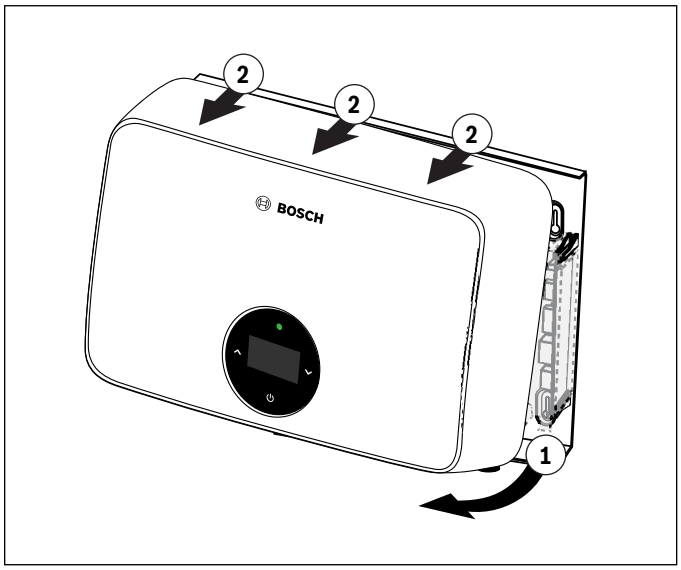


Figure 16

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

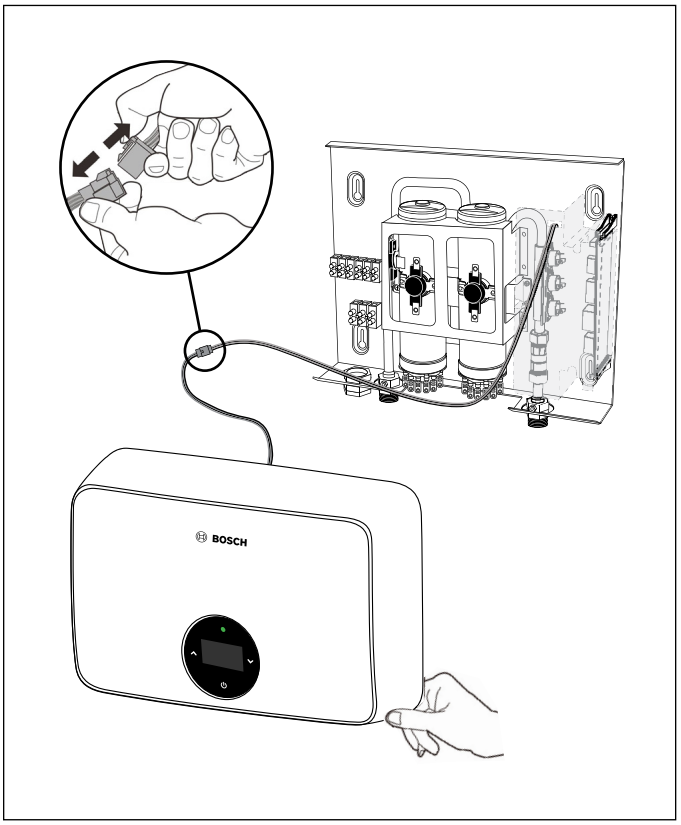


Figure 17

4. Remove cover completely.

11.2 Cleaning the Inlet Pre-Filter

1. Remove and clean the pre-filter on the inlet water side once every year and any time maintenance is performed on the heater.
2. Wash lightly to remove any debris.
3. Reinstall filter and purge air from the system prior to turning on power.

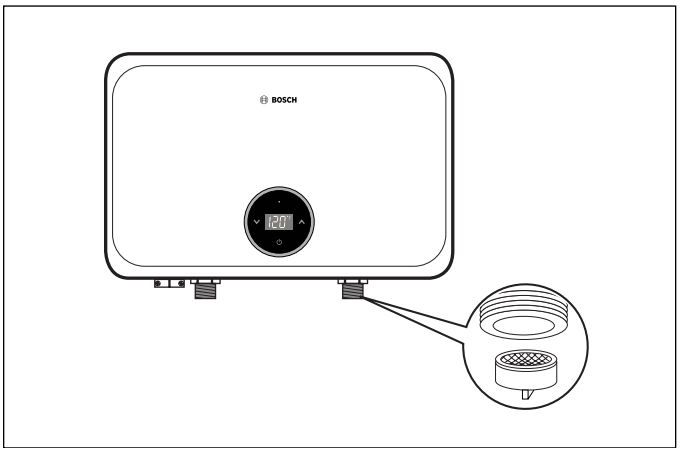


Figure 18

WARNING: ELECTRICAL HAZARD

- When any form of maintenance is carried out on the water heater or the home's plumbing system that may introduce air into the pipes, it is crucial to turn the power off to the water heater and purge the air out of the lines before restoring power to the unit. Follow "Filling the Water Heater", this manual. FAILURE TO DO SO COULD RESULT IN PERMANENT DAMAGE TO THE HEATING ELEMENT AND VOID YOUR WARRANTY.

11.3 Draining the Heater

The water heater can be emptied by:

- Siphoning the water out through any lower service valve on the inlet side.
- Keep a hot water faucet open while siphoning the water out.

11.4 Removing a Heating Element

1. Shut off the power supply and drain the water heater.
2. Remove the front cover per the instructions in Section 11.1 **or damage may occur.**
3. Remove all 6 wires connected to the heating element.

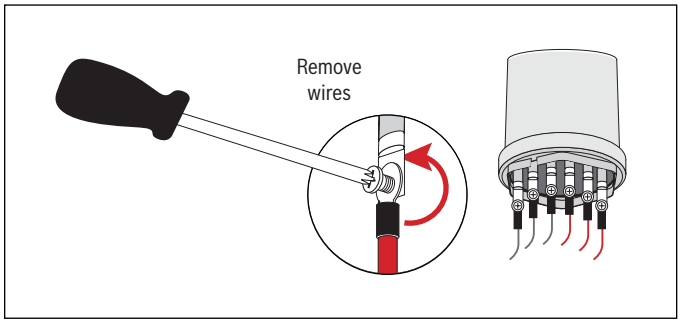


Figure 19

4. Use a suitable wrench to remove the element containing cap from the water heating canister. See Figure 20.

Residual water will be still be in the canister even after draining. Be prepared for water coming out of the bottom.

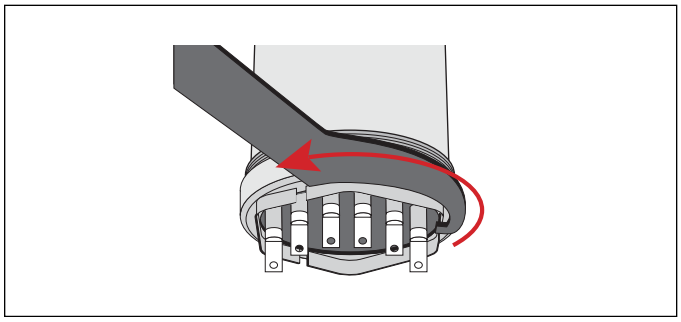


Figure 20

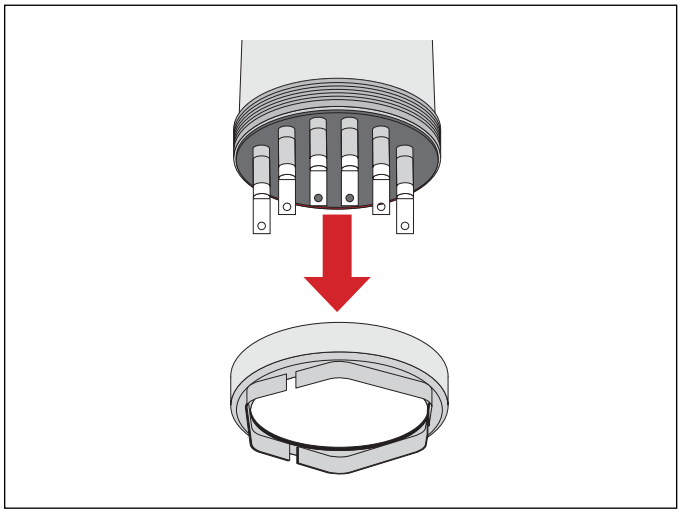


Figure 21

5. In order to remove the heating element, you must unlock it from the tab on the inside of the heating canister. Push the element bottom up slightly into the canister and then rotate to release it from the heating canister tab. See Figures 22 & 23.

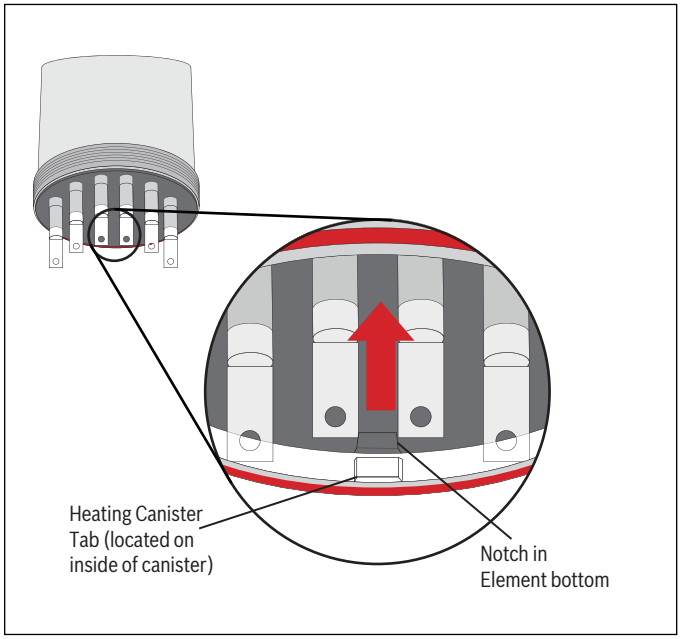


Figure 22

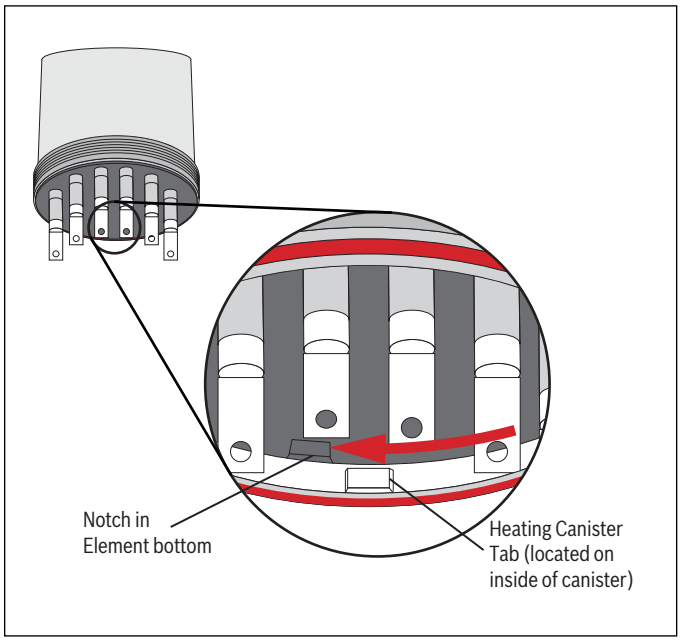


Figure 23

6. Pull down to emove the heating element.

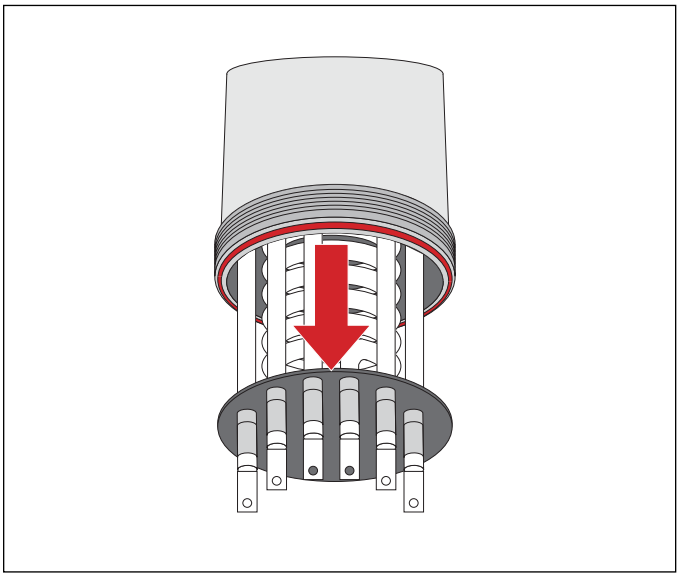


Figure 24

7. Install new element with red O-Ring, making sure the O-Ring and element are positioned correctly.

It is recommended to replace the O-ring to avoid leaking.

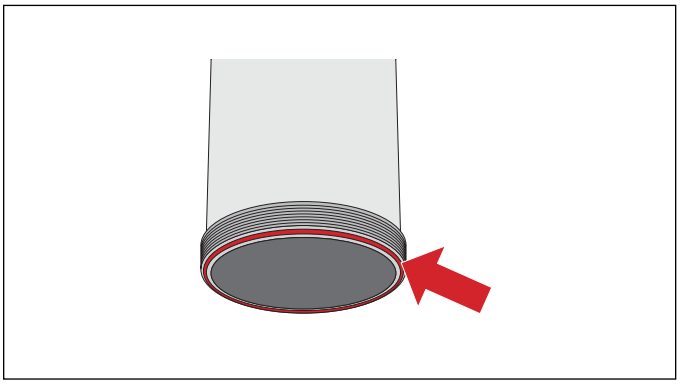


Figure 25

8. Insert new heating element into heating canister

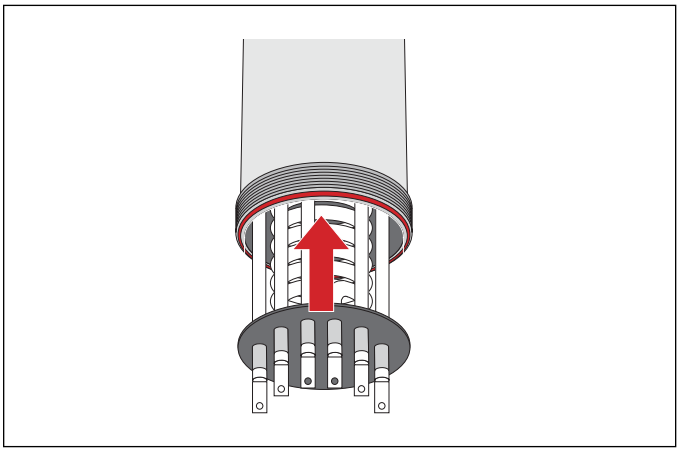


Figure 26

9. Align tab on the inside of the heating canister with notch in element bottom so they are slightly off center. Push the element bottom up slightly into the canister so it is above heating canister tab. Then rotate to align notch with the tab. Pull element down to seat notch in the heating canister tab.

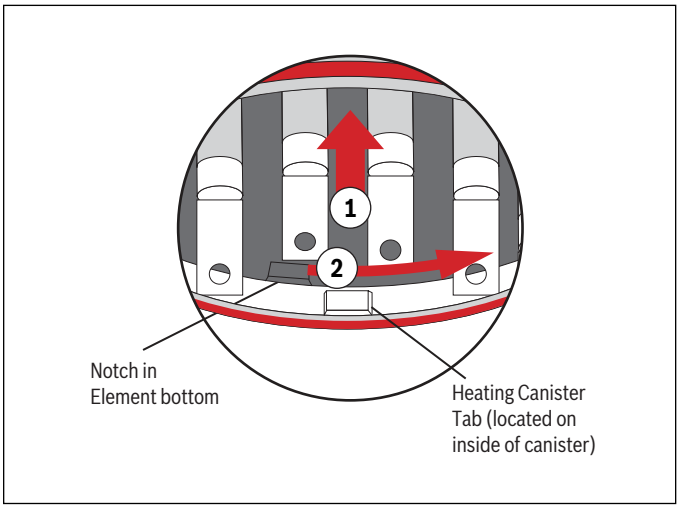


Figure 27

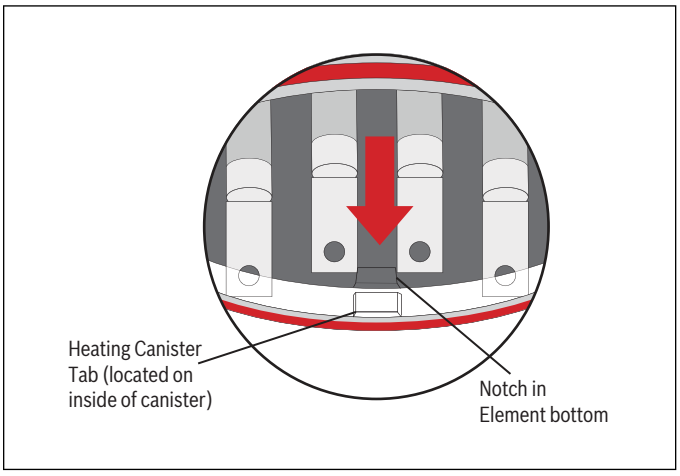


Figure 28

10. Reinstall element containing cap on the water heating canister to secure the element.

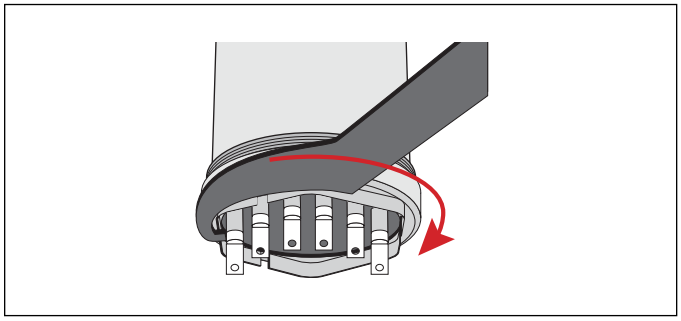


Figure 29

11. Reconnect all wires connected to the heating element.

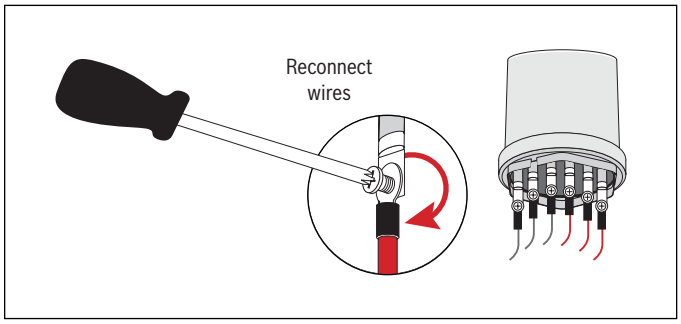


Figure 30

Heat shrink/electrical tape (field supplied) must be re-applied to the connectors to cover the screws to avoid product damage.

12. Refill the water heater with water before restoring power. Then replace cover and verify proper 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 while heating canister is dry. Failures due to “dry-firing” ARE NOT covered by warranty.

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 th stainless steel sheath) on the element.
2. Brush the dried minerals off.

Reinstall the element after descaling.

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 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 (Phone: 1-866-642-3198).

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.

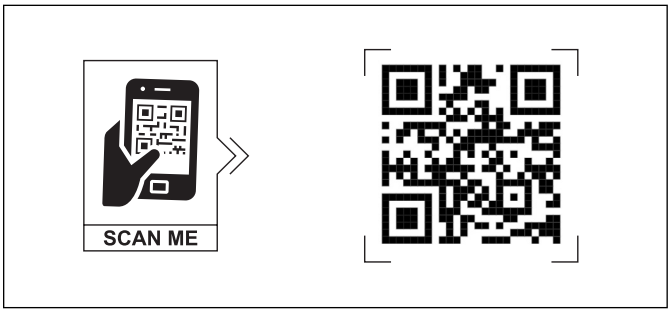


Figure 31

Problem	Possible Causes	Solution
No hot water	Power outage or faulty wiring	Check the power supply for incorrect phasing or insufficient voltage (page 18)
		Ensure the breakers at main electrical panel are ON. A breaker may be faulty or the unit may be wired incorrectly
		Ensure the shutoff valve on the unit's incoming water supply line is fully open
	The flow rate needed to activate the heating element (0.5 gpm) has not been reached	Increase the flow rate from the water supply source
		Clean the filter screen on the unit's water inlet
	The high limit has tripped	Refer to Section 12.1 High Limit Switch
	Unit is powered off	Refer to Section 9 to power on the unit
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 rate
	Voltage less than 240 volts	This water heater is designed to operate on 240 volts. A lower voltage will produce less heating power. It may be necessary to upgrade to a larger input heater Ensure the breakers at main electrical panel are ON. A breaker may be faulty or the unit may be wired incorrectly
	Crossed wires.	Ensure the breakers at main electrical panel are ON. A breaker may be faulty or the unit may be wired incorrectly
	Reduction in the seasonal inlet water temperature or temperature setting is too low	Increase the temperature setting on the unit or reduce the flow rate
	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
	Cold water is mixing in before the faucet	An anti-scald feature may be installed on the faucet that is mixing cold water creating a plumbing crossover. These types of features can usually be adjusted to reduce the amount of cold water mixed
	Thermal loss due to long pipe run	As hot water runs through the system to the faucet some heat will be lost, especially if it has a long distance to travel or the pipes are cold. This is normal and can be compensated for by increasing the temperature setting and insulating the pipes
	Failed heating element	Test the heating element according to Section 12.3
	Electrical malfunction	Contact a qualified electrician or your local authorized distributor for service

Table 7

Troubleshooting continued

Problem	Possible Causes	Solution
Water Temperature Varies from Hot to Cold During Use	Water pressure has dropped below minimum level	Increase the flow rate from the water supply source
	Water flow is not stable or it is varying	Ensure stable water flow, check for plumbing issues/crossovers
Water Too Hot	Not enough water flowing through the heater	Increase the flow rate at the water outlet. Check inlet filter
	Increase in the seasonal inlet water temperature or temperature setting is too high	Switch to a lower temperature setting or increase flow
Water Stops Flowing	Blockage in water pipes/hoses or inlet water filter	Ensure the main water shutoff valve is fully open and there are no obstructions in the water supply line or inlet water filter
	No water supply	

Table 8

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 heating canister and piping.

12.1 High Limit Switches

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.

Occasionally, the high temperature limit switches may trip, resulting in power being shut down as a safety precaution. This can happen if the water temperature exceeds 135℉/57℃. For the water heater to be put back into operation, the tripped high limit switch will need to be reset.

The reset method will depend on which type of switch as tripped;

1. If the high limit switch has a button in the center of it; This is a manual high limit switch. To reset, please first ensure that all circuit breakers that supply the water heater are turned OFF (**NEVER attempt to reset a manual limit switch with the power supplies still on!**). You can then press the reset button. If you hear a click, then this high limit switch 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.

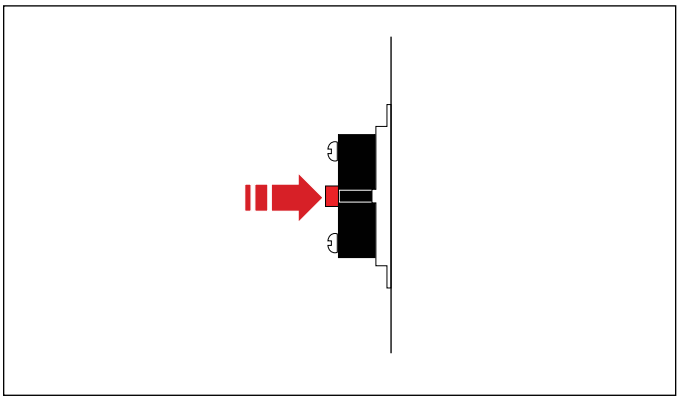


Figure 32

2. If the high limit switch has NO button on it; This is an automatic-reset high limit switch. Once the overheat condition has ended, this type of high limit switch should reset itself. Open the hot water faucet and allow about one minute for limit switch to reset. If the limit switch has not reset itself, it may be necessary to test the switch for failure. To test an automatic high limit switch, 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 limit switch. If you have continuity, the switch has reset and power will flow across it. If you have no continuity across the limit switch and it is cool to the touch, it may have failed and will require replacement

CAUTION: PRODUCT DAMAGE, PROPERTY DAMAGE

- Repeated tripping of the High Limit Switch (TCO) indicts a problem. Call a technician if the high limit needs to be reset frequently.
- Measure resistance across contacts after resetting and note value.

12.2 Checking Thermostat Operation

To check thermostat operation:

1. Press the ⏻ button to activate the heater. The display will show the outlet temperature.
2. With the water running through the unit, press ∧ to increase or ∨ to decrease the outlet temperature. The recommended temperature setting is 120℉ (49℃).

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

3. After adjusting the water temperature, allow the heater enough time to heat the water to temperature. Then use a thermometer to measure the water temperature at a hot water outlet in the structure.

12.3 Testing the Heating Element

To Test Heating Element:

1. Verify that circuit breakers are off and there is no voltage at the unit.
2. Disconnect wires from the heating element. It is recommended to mark or take a picture of wire positions for reinstallation.
3. Using a 200 ohm range on a digital multi-meter, measure resistance (ohms) across the wire connections on the base of each heating element canister. Ensure multi-meter probes are under insulation sheathing and making good contact. Test points are as follows:
   - A+ to A-
   - B+ to B-
   - C+ to C-

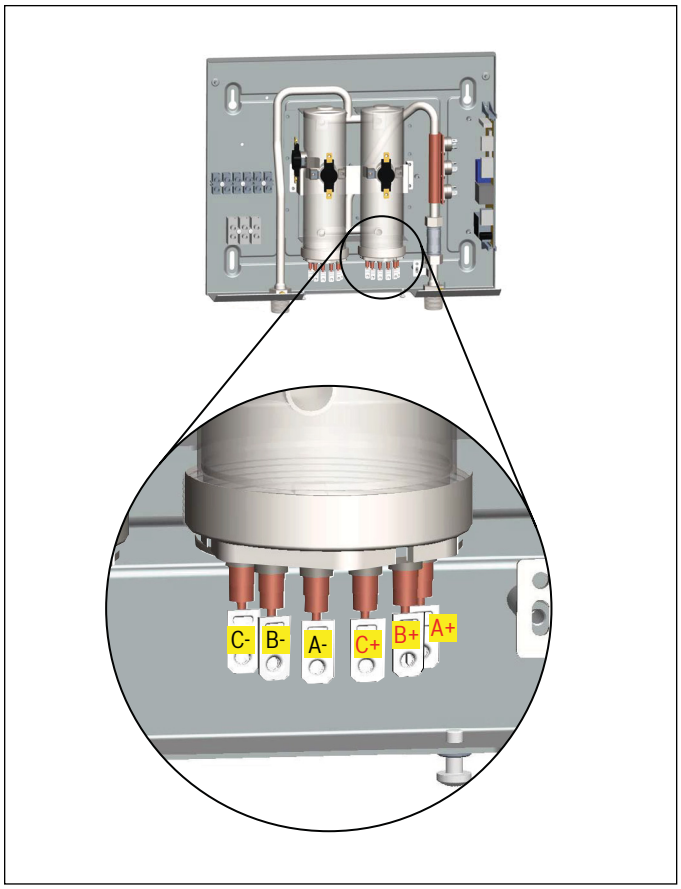


Figure 33

Heating Element Test Points	TR6100C-18	TR6100C-27
A+ to A-	19.2 ± 1.0 ohms	12.8 ± 0.7 ohms
B+ to B-	19.2 ± 1.0 ohms	12.8 ± 0.7 ohms
C+ to C-	19.2 ± 1.0 ohms	12.8 ± 0.7 ohms

Table 9

4. If an element tests bad, it must be replaced following the procedure in Section 11.4.

12.4 Testing / Changing a Triac

A failed triac might cause overheating or irregular heating or no heating at all. If all other troubleshooting steps mentioned above do not reveal the problem, follow below instructions to test the triacs.

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.

1. Shut off the power supply to the water heater.
2. Remove the front cover per the instructions in Section 11.1 **or damage may occur.**
3. Remove the three screws holding the internal protective cover.

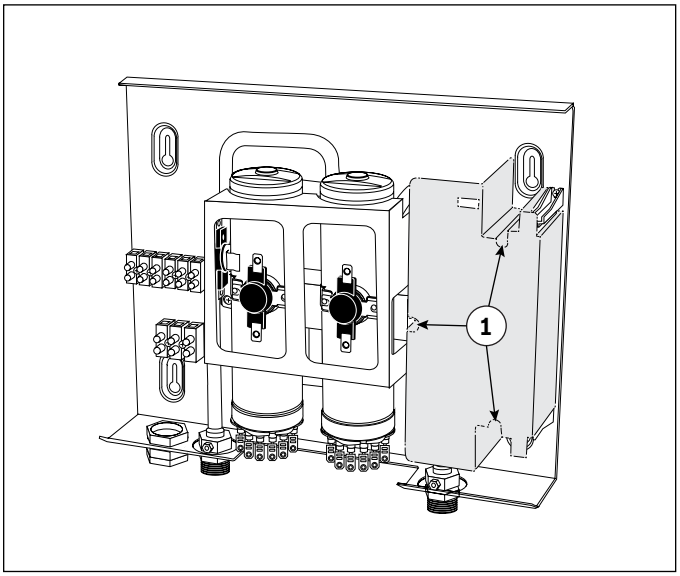


Figure 34

4. Locate the triacs

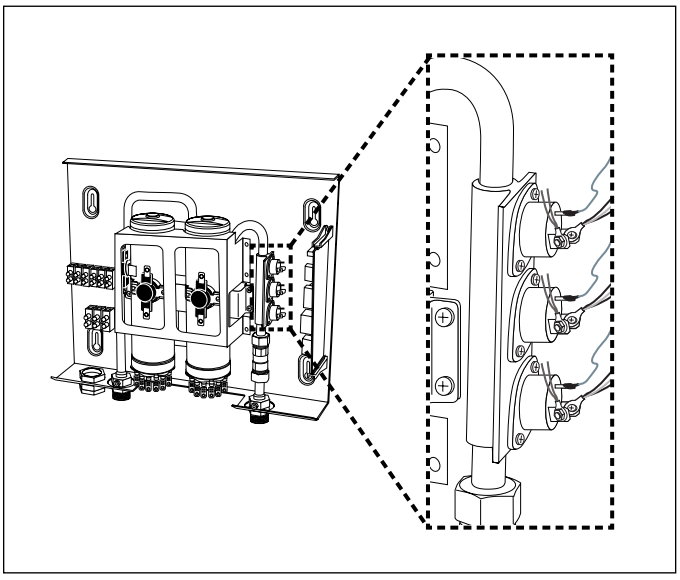


Figure 35

To Test Triac:

1. Measure resistance (Ω) across terminals as shown below

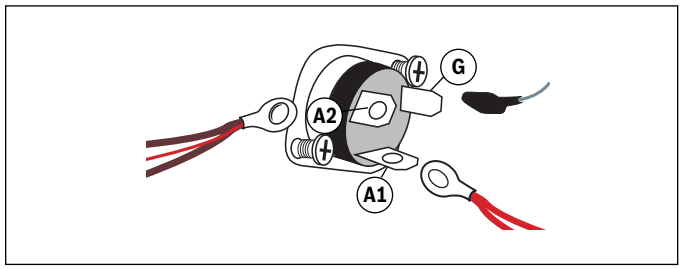


Figure 36

Test Points	Proper Reading
A1 to A2	Open Circuit
G to A1	Continuity

Table 10

To Change Triac:

1. Ensure the power supply is turned off.
2. Take a phote of triac wiring for reinstallation. Disconnect the three (3) wire connectors on the triac. Remove the wires.

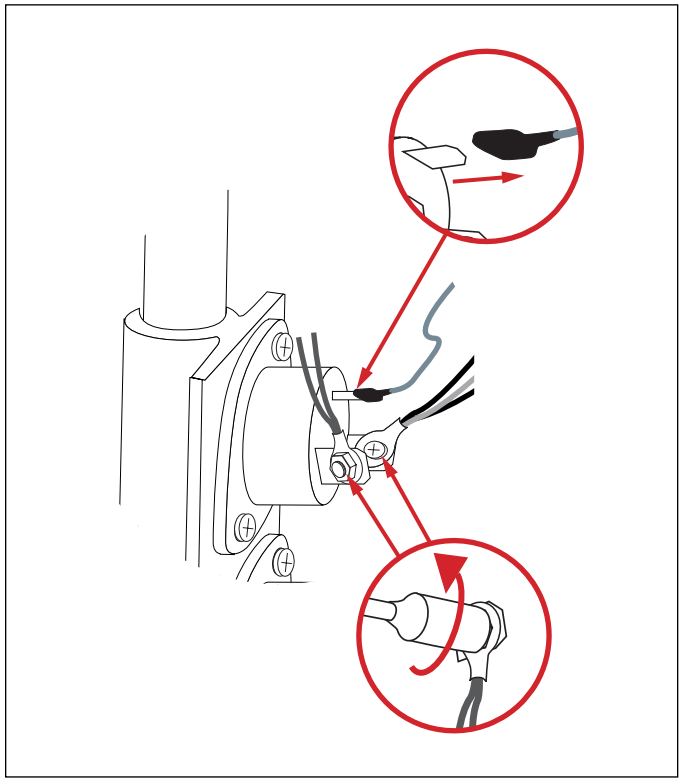
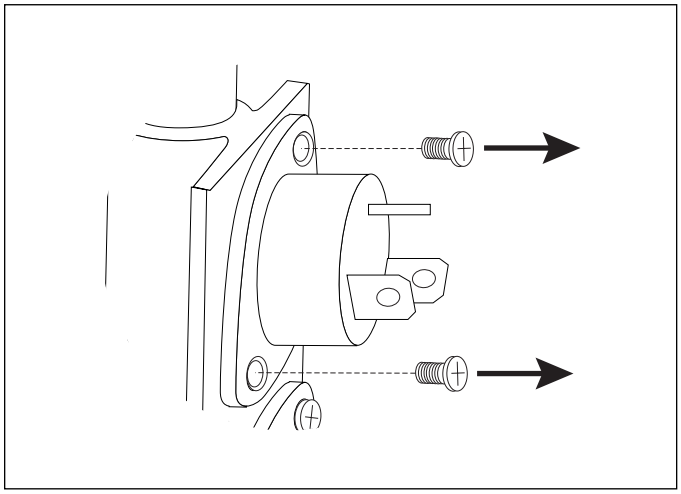


Figure 37

3. Remove the two (2) screws holding the triac to the inlet pipe. Remove the triac.



4. Install the new triac to the inlet pipe using the two (2) screws.
5. Re-attach the wiring to the triac
6. Re-attach internal protective cover and front cover.
7. Return heater to service.

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

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.

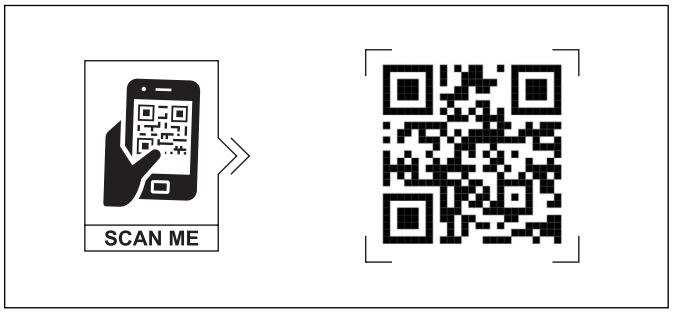


Figure 38

NOTES:

NOTES:

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www.bosch-homecomfort.us

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