

Tankless electric whole house water heaters

## TRONIC 6000C

Models: WH17 / WH27



**BOSCH**

[en] Installation Manual and Operating Instructions




## Table of contents

<b>1</b>	<b>Explanation of symbols and safety instructions</b>	<b>3</b>
1.1	Key to symbols	3
1.2	Important safety instructions	4
<b>2</b>	<b>General information</b>	<b>6</b>
2.1	Technical identification code	6
2.2	Model name and number identification	6
2.3	Package contents	6
2.4	Components Diagram	7
2.5	Dimensions	8
2.6	Wiring diagram	9
2.7	Function	10
2.8	Technical specifications	11
<b>3</b>	<b>Regulations</b>	<b>11</b>
<b>4</b>	<b>Installation</b>	<b>12</b>
4.1	Important information	12
4.2	Selection of place of installation	12
4.2.1	Freeze prevention	12
4.2.2	Recommended minimum clearances for servicing	13
4.3	Mounting the water heater	13
4.4	Water connections	13
4.4.1	Water quality	14
4.5	Electrical connections	14
4.6	Starting up	17
4.6.1	Checking for leaks and purging air	17
4.6.2	Adjusting the temperature dial	17
4.6.3	Adjusting the flow	17
<b>5</b>	<b>Operation instructions</b>	<b>18</b>
5.1	Before using the water heater	18
<b>6</b>	<b>Maintenance</b>	<b>19</b>
<b>7</b>	<b>Troubleshooting</b>	<b>21</b>
<b>8</b>	<b>Spare Parts</b>	<b>25</b>

# 1 Explanation of 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.

### Additional symbols

Symbol	Explanation
►	Step in an action sequence
→	Cross-reference to another part of the document
•	List entry
–	List entry (second level)

Table 1

## 1.2 Important safety instructions

When using this electrical equipment, basic safety precautions should always be followed, including the following:

### ► READ AND FOLLOW ALL INSTRUCTIONS.

- This appliance must be grounded.
- Disconnect this product from the electrical supply before cleaning, servicing or removing the cover.
- To reduce the risk of injury, close supervision is necessary when the product is used near children or elderly persons.
- Warning: Mount the unit onto a flat section of wall, well away from any potential splashes of water or spray and away from areas where direct moist or wet contact could occur.
- Warning: Indoor installation only, where it will NOT be exposed to freezing.
- Warning: Do not install a check valve or any other type of back flow preventer within ten feet of the cold water inlet.
- The electrical installation must conform to current National Electrical Codes.
- Warning: Do not switch the heater on if you suspect that it may be frozen. Wait until you are sure that it has completely thawed out.
- The Tronic 6000C is designed to heat potable cold water for domestic

purposes. The heater is not designed to accept inlet water temperatures above 86° F. The water heater is not designed for preheated water or recirculation applications. Contact Bosch Thermotechnology Corp. before specifying or installing the appliance in any other application.

## IMPORTANT SAFETY INSTRUCTIONS

### ► ADDITIONAL CANADIAN SAFETY INSTRUCTIONS:

- As per the Canadian Electrical Code, C22.1-02 Section 26-744, an auxiliary terminal block must be fitted to the unit before connecting to the electrical supply (Kit Part N° “AE Canada Kit”).  
(→ See Fig. 9 and Fig. 10).
- A green terminal (or a wire connector marked “G,” “GR,” “GROUND” or “GROUNDING”) is provided within the control. To reduce the risk of electrical shock, connect this terminal or connector to the grounding terminal of the electrical service of supply panel with a continuous copper wire in accordance with the Canadian Electrical Code, Part I.
- This product shall be protected by a Class A ground fault circuit interrupter.

## **SAVE THESE INSTRUCTIONS**

- Keep this manual in a safe place once the unit has been installed as it may be needed for future reference.

### **Safety of electrical appliances for domestic use and similar purposes**

Product installation and use must be in accordance with EN 60335-1 in order to prevent hazards from occurring when using electrical appliances.

2 General information

2.1 Technical identification code

EI	17	E/M	W	I	H	B
EI	27	E/M	W	I	H	B

Table 2

- [EI] Electronic Instantaneous
- [17/27] Maximum output (kW)
- [E/M] Electronic / mechanical temperature control
- [W] Wall hung
- [I] Indoor
- [H] Horizontal installation
- [B] Water connections

2.2 Model name and number identification

Model Name	Model Number
WH17	EI 17 E/M W I H B
WH27	EI 27 E/M W I H B

Table 3

2.3 Package contents

- Tankless electric water heater.
- 4 screws.
- Installation Manual.
- Warranty Registration Card.
- Warranty Statement.

## 2.4 Components Diagram

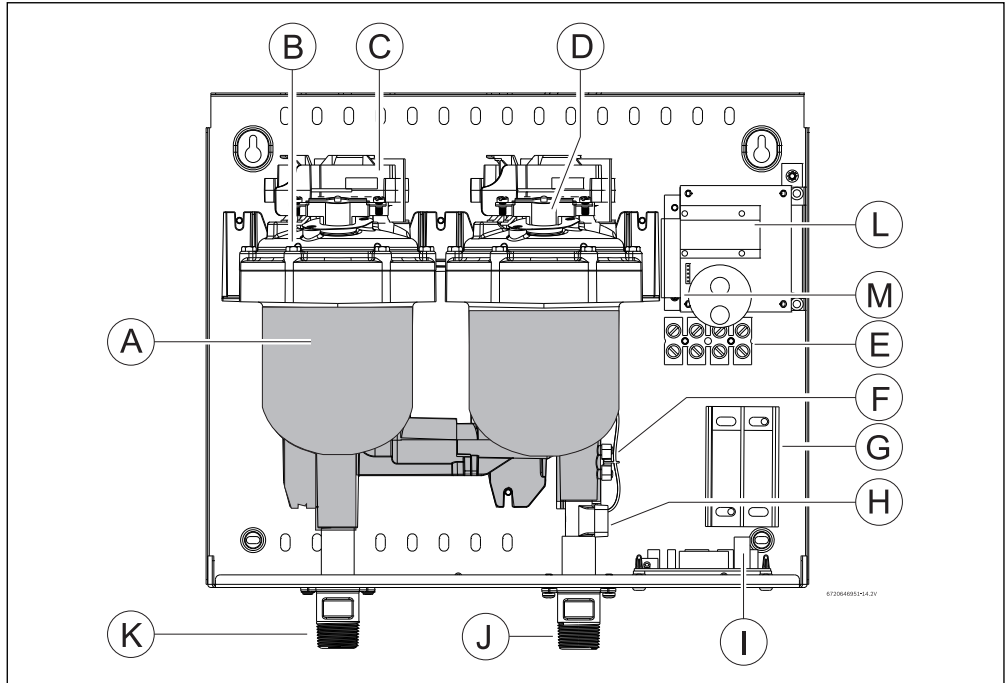


Fig. 1

- [A] Heating module
- [B] Heating element assembly
- [C] Heating module PCB
- [D] Double pole thermal cutout (WH27).  
Single pole thermal cutout (WH17).
- [E] 6 way terminal block (WH27).  
4 way terminal block (WH17).
- [F] Temperature sensor
- [G] Terminal block (CANADA ONLY)
- [H] Flow transducer
- [I] Control PCB
- [J] Cold water inlet
- [K] Hot water outlet
- [L] Display PCB
- [M] Display DIP switch

2.5 Dimensions

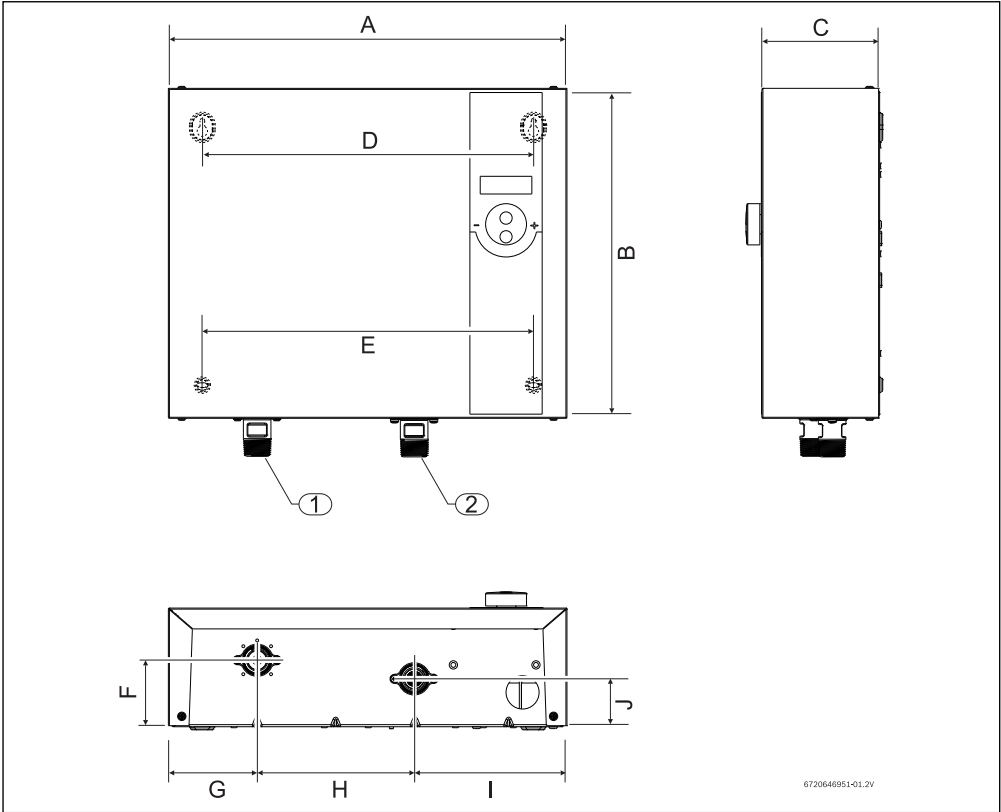


Fig. 2

[1] Outlet ¾ " NPT (hot water)

[2] Inlet ¾ " NPT (cold water)

Dimensions (inches)	WH17 / WH27
A (Width)	15 ¼ "
B (Height)	12 ½ "
C (Depth)	4 ½ "
D	12 5⁄8 "
E	12 5⁄8 "
F	2 ½ "
G	3 ½ "
H	6 1⁄8 "
I	5 3⁄4 "
J	1 3⁄4 "
Water connections	¾ "

Table 4    Dimensions



## 2.6 Wiring diagram



**DANGER:** Risk of electric shock!

- Always switch off the electricity supply to the unit before any intervention in the heater.

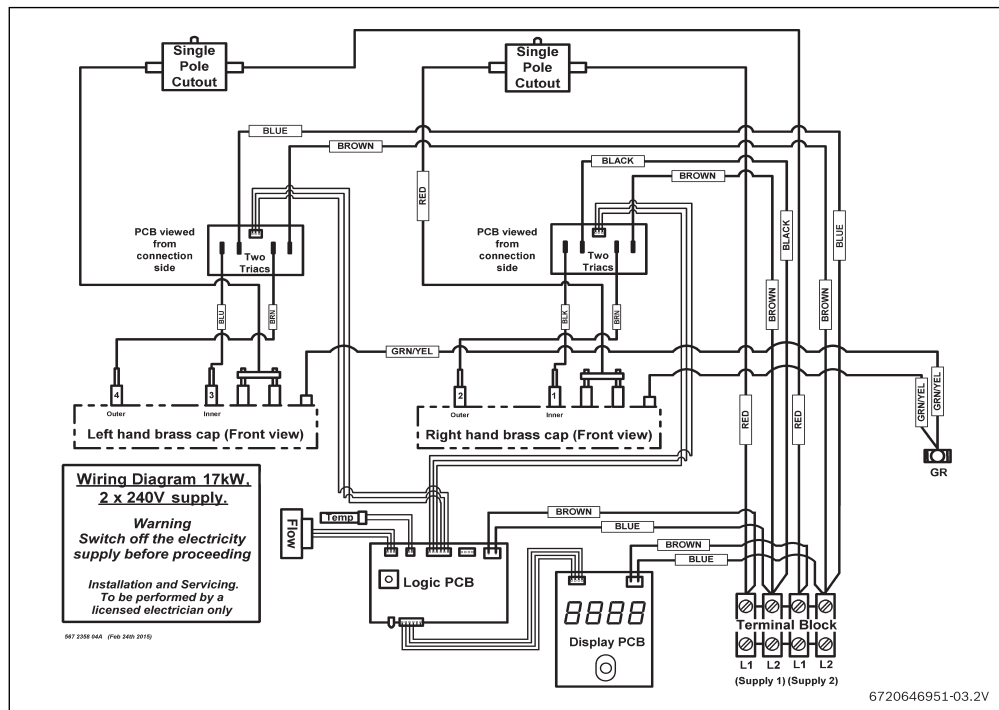


Fig. 3 Internal wiring schematic for single phase WH17 unit.

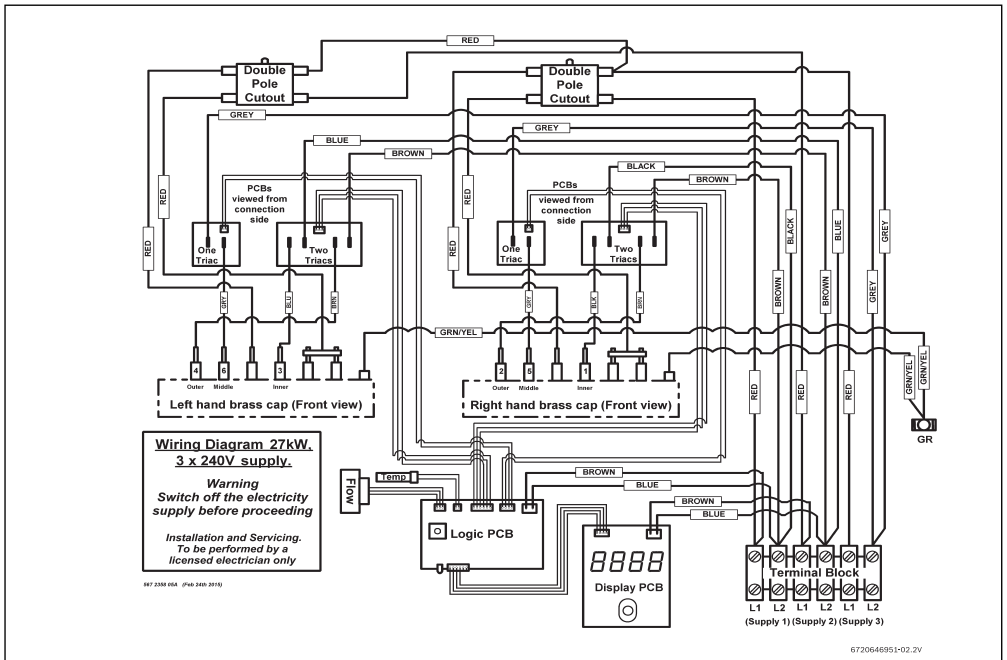


Fig. 4 Internal wiring schematic for single phase WH27 unit.

## 2.7 Function

### How the water heater works:

- The Tronic 6000C heats water continuously as it flows through the 2 heater modules.
- The electronic control PCB monitors the flow rate and the incoming water temperature and then switches on the required number of heater elements to reach the temperature set by the temperature adjustment dial.
- The temperature dial sets the heater set-point temperature. Please note heat loss, pipe run, and other factors affect the outlet temperature at end use.
- As the flow rate or the incoming water temperature changes, the electronic control adjusts the number of heater elements used so that the outlet temperature is maintained.
- The outlet water temperature can change slightly as the flow rate changes due to the steps in power as different heater elements are switched on and off.
- The outlet water temperature can also vary if the maximum flow rate is exceeded (→ see Fig. 11) or if the supply voltage changes.

- Each heater module is protected by an electro-mechanical thermal cutout. This cutout will only trip in exceptional circumstances.



### WARNING:

- ▶ The cause of the cutout tripping MUST be resolved.
- ▶ NEVER reset the thermal cutout with the power supply still switched ON.
- ▶ See troubleshooting section for further information.

- Contact Technical Support 800-798-8161 for further instruction.
- The WH17 unit is supplied from two independent voltage supplies and the WH27 unit from three independent voltage supplies. (In Canada the unit has just one voltage supply).
- Depending on the region of the country, the temperature of the water supply can vary between an average of 40 °F in winter to 70 °F in summer, with an average of 55 °F. The output temperature and maximum flow of the heater is dependent on inlet water temperature.

## 2.8 Technical specifications

Technical characteristics	Units	WH17	WH27
Voltage supply	V	2 X 240VAC (Canada 240VAC)	3 X 240VAC (Canada 240VAC)
Amperage	A	2 X 40A (Canada 1 x 80A)	3 X 40A (Canada 1 x 120A)
Maximum output	kW	17.25kW	26.85kW
Temperature control range		95 °F to 131 °F	95 °F to 131 °F
Minimum water pressure	psi	15psi	15psi
Maximum water pressure	psi	150psi	150psi
Minimum flow rate	gal/min	0.6 US gal / min	0.6 US gal / min
Maximum flow rate		(→refer to Fig. 11)	(→refer to Fig. 11)
Weight (without water)	lbs	20 lbs	22 lbs
The unit will work at lower supply voltages but the following changes will apply:			
Maximum output		15kW at 220V	22.5kW at 220V
		13kW at 208V	20kW at 208V
Maximum flow rate(→refer to Fig. 11)		84% of maximum at 220V	84% of maximum at 220V
		75% of maximum at 208V	75% of maximum at 208V

Table 5

## 3 Regulations

Any federal, state, and local codes and regulations pertaining to installation and use of electric water heating appliances must be observed. Please refer to the laws that should be attended in your area.

- The electrical installation must conform to current National Electrical Codes.
- As per the Canadian Electrical Code, C22.1-02 Section 26-744, an auxiliary terminal block must be fitted to the unit before connecting to the electrical supply (Kit Part N° "AE Canada Kit").
- A green terminal (or wire connection marked "G", "GR", "GND", "GROUND" or "GROUNDING") is provided within the control box. Additional Canadian safety instructions, to reduce the risk of electrical shock, connect this terminal or connector to the grounding terminal of the electrical service of supply panel with a continuous copper wire in accordance with the Canadian Electrical Code, Part I.
- In Canada this product shall be protected by a Class A ground fault circuit interrupter.
- The unit must be wired by a qualified electrician, in accordance with the current version of the National Electrical Code (US) or Canadian Electric Code (Canada).
- 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.).
- The power cable size and the installation must be in accordance with the US National Electrical Code or the Canadian Electrical Code, C22.1-02.

## 4 Installation


**DANGER:** Risk of electric shock!

- For safety reasons, disconnect the power supply to the heater before any service or testing is performed.


**WARNING:**

- This heater must be electrically grounded in accordance with the most recent edition of the National Electrical Code, NFPA 70. In Canada, all electrical wiring to the heater must be in accordance with local codes and the Canadian Electrical Code, CSA C22.1 Part 1.

### 4.1 Important information


**DANGER:**

- The installation must only be performed by a qualified person in accordance with these instructions.
- Bosch Thermotechnology Corp. is not responsible for improperly installed appliances.


**WARNING:**

- The heater must only be mounted in a horizontal position with the water fittings located at the bottom of the heater. Under no circumstances should the heater be mounted differently.


**WARNING:**

- The appliance should be located in an area where leakage of the heater or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure.

Please follow these instructions. Failure to follow instructions may result in:

- Damage or injury.
- Improper installation/operation.
- Loss of warranty.

## 4.2 Selection of place of installation


**WARNING:** Risk of freezing!

- Do not install the water heater in an area where there is a chance of freezing. Damage to the water heater as a result of freezing will not be covered under warranty.

- If being used in a public place, locate the heater out of easy reach to discourage vandalism.
- Mount the unit onto a flat section of wall, well away from any potential splashes of water or spray and away from areas where direct moist or wet contact could occur.
- Install the heater in a place that provides easy access for any service or maintenance.

### 4.2.1 Freeze prevention


**DANGER:**

- ELECTRICITY IS EXTREMELY DANGEROUS. TAKE EXTRA PRECAUTIONS AND ENSURE ALL CIRCUIT BREAKERS ARE OFF BEFORE PERFORMING ANY WORK TO THE HEATER.


**WARNING:**

- Indoor installation only, where it will NOT be exposed to freezing.

### Introduction

Please note that the installation manual states that the water heater must not be installed in a location where it may be exposed to freezing temperatures. If the heater must be left in a space that is likely to experience freezing temperatures, all water must be drained from the heater. → See Section 6.

**Freeze damage is not covered under the warranty.**



Use of chemical agents such as anti-freeze are not allowed as they may cause damage to the water heater's internal components.

#### 4.2.2 Recommended minimum clearances for servicing

Should it be necessary to service the Tronic 6000C, observe the following clearances. These are not required clearances, but would facilitate any service work.

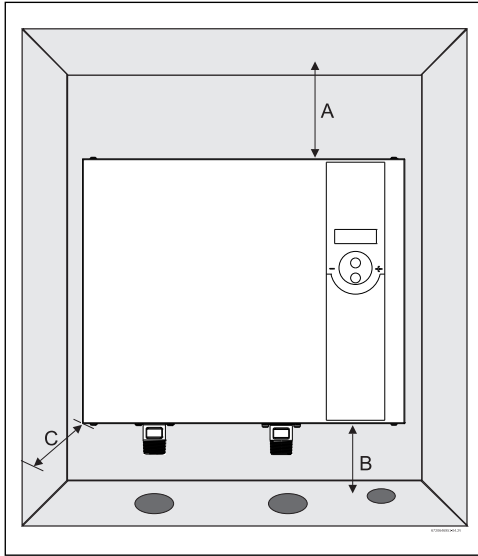


Fig. 5 Recommended minimum clearances

	WH17	WH27
Top (A)	12"	12"
Sides	0"	0"
Bottom (B)	6"	6"
Front (C)	12"	12"

Table 6 Recommended minimum clearances

#### 4.3 Mounting the water heater



##### WARNING:

- ▶ The heater must only be installed in the orientation shown in Fig. 6 i.e., mounted in a horizontal position with the water fittings located at the bottom of the heater. **Under no circumstances should the heater be mounted differently.**

- ▶ Undo the retaining screws on the front cover. Remove the temperature knob by pulling up with slight force. Place knob and white bushing aside, and take the cover off the heater. Hold the back plate in position against the wall and mark the four mounting holes.

- ▶ Drill the holes and secure the heater using the four wood screws supplied.

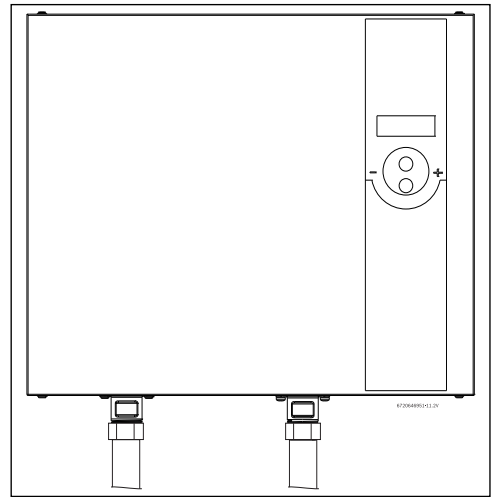


Fig. 6 Vertical mounting position

#### 4.4 Water connections



##### WARNING:

- ▶ Do not install a non-return check valve within 10 feet of the inlet.



##### WARNING:

- ▶ Do not apply heat or solder to connections or pipe if they are already connected to the unit.



##### NOTICE: Disclaimer

- ▶ In the Commonwealth of Massachusetts a pressure relief valve shall be installed on the cold water side by a licensed plumber. (MGL 142 Section 19).

- ▶ The heater must be connected directly to the main cold water supply and not to pre-heated water. (The inlet water temperature must not be greater than 86 °F).
- ▶ The heater must be installed with shutoff valves on both the inlet and outlet connections.
- ▶ It is recommended that you use ¾ inch or ½ inch copper.
- ▶ Do not use plastic piping within 3 feet on either side of heater.

- ▶ Use Teflon tape for sealing pipe threads. Do NOT use pipe dope.
- ▶ Remember to keep the hot water pipe runs as short as possible.



After the heater has been plumbed, and before you wire it, flush it with water to remove any debris or loose particles. Heater must be full of water and air purged before power is turned on. Failure to do so may result in damage to the product that is not covered by warranty.

- ▶ After flushing and filling the heater with water, (with power off) disconnect the inlet connection and inspect the filter screen for any debris that may have been flushed through the system.



The inlet and outlet connections are clearly marked on the heater. They each have a  $\frac{3}{4}$  inch male NPT connector.

- ▶ Check the pressure of the main water supply. To operate correctly, the heater needs the running pressures mentioned in → Tab. 5.

#### 4.4.1 Water quality

Water quality can have an impact on appliance longevity and may not be covered under the manufacturer's warranty.

- ▶ For water analysis data call your local water department, or if on a well, have well water analyzed periodically. If water quality exceeds one or more of the values specified below, Bosch recommends consulting a local water treatment professional for water softening/conditioning options.

Description	Max. Levels	
pH	pH	6.5 - 8.5
TDS (total Dissolved Solids)	mg/l or ppm	500
Total hardness	mg/l or ppm	100 (6 grains)
Aluminum	mg/l or ppm	2.0
Chlorides	mg/l or ppm	250
Copper	mg/l or ppm	1.0
Iron	mg/l or ppm	0.3
Manganese	mg/l or ppm	0.05
Zinc	mg/l or ppm	5.0

Table 7

## 4.5 Electrical connections



### WARNING:

- ▶ The unit must be wired by a qualified electrician, in accordance with the current version of the National Electrical Code (US) or Canadian Electric Code (Canada).



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.).



As per the Canadian Electrical Code, C22.1-02 Section 26-744, an auxiliary terminal block must be fitted to the heater before connecting to the electrical supply. This is available as a kit from Bosch Thermotechnology Corp. Part Number "AE Canada Kit". (Contact 800-798-8161).

### US wiring

- The minimum recommended wire size is 8 AWG. (The terminal block will accept cables up to 6 AWG size).
- The cable entry is via the  $1\frac{1}{4}$  inch cable entry hole on the bottom right hand edge of the back plate.
- Strip back the insulation on the power wires about  $\frac{1}{2}$  inch. Connect the live wires to the terminals marked "L1" and "L2." There are two pairs of live wires in the WH17 and three pairs of live wires in the WH27. (→ See Fig. 7 and Fig. 8, page 15).
- Any insulation on the ground wires should be stripped back about  $\frac{3}{4}$  inch. The ground leads must be connected to the pillar terminal marked "GR". (→ See Fig. 7 and Fig. 8, page 15).
- Make sure the terminal block screws are tightened securely. Loose connections can cause wires to heat up.
- Make sure that the ground wires are wrapped around its terminal stud and into the saddle washer. The nut should be tightened securely.
- Attach the front cover, replace the white bushing with flat end facing up, replace the knob in any orientation by pushing down to secure and tighten the retaining screws.

The WH17 requires two independent 240V AC circuits protected by two separate and independent double pole breakers (as shown) rated at 40A each.

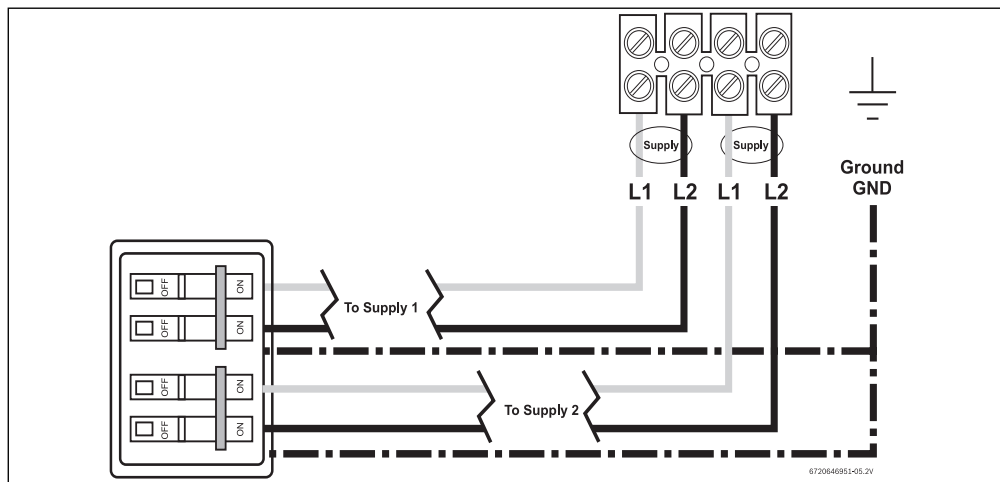


Fig. 7 WH17 terminal block connection (U.S.A. only)

The WH27 requires three independent 240V AC circuits protected by three separate and independent double pole breakers (as shown) rated at 40A each.

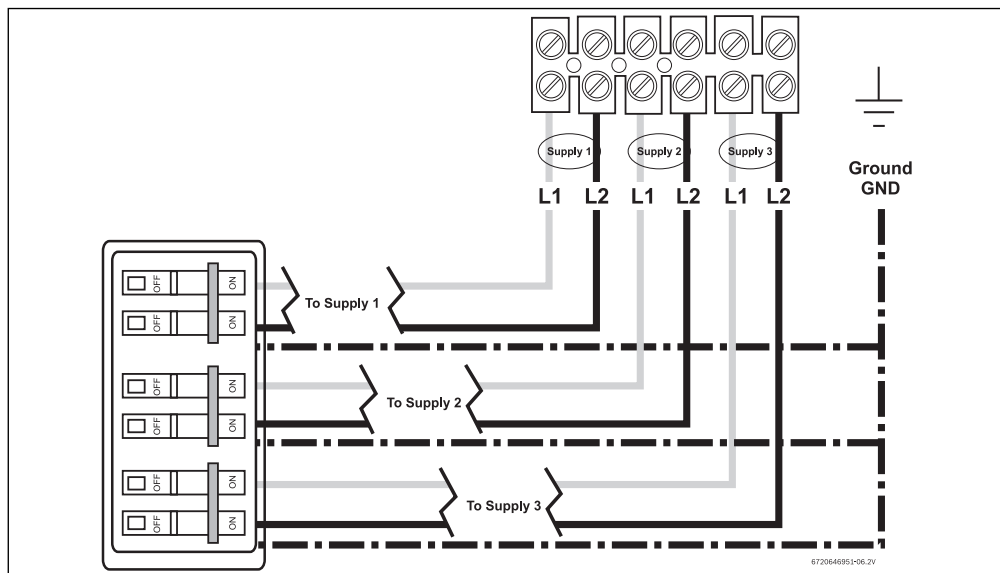


Fig. 8 WH27 terminal block connection (U.S.A. only)

**Canada Wiring - auxiliary terminal block and connections**

Fitting the auxiliary terminal block (see diagram below).

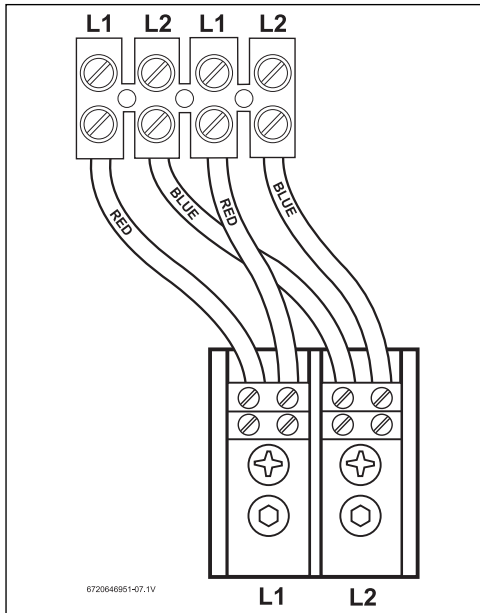


Fig. 9 For Canada only (Not for U.S.A.)

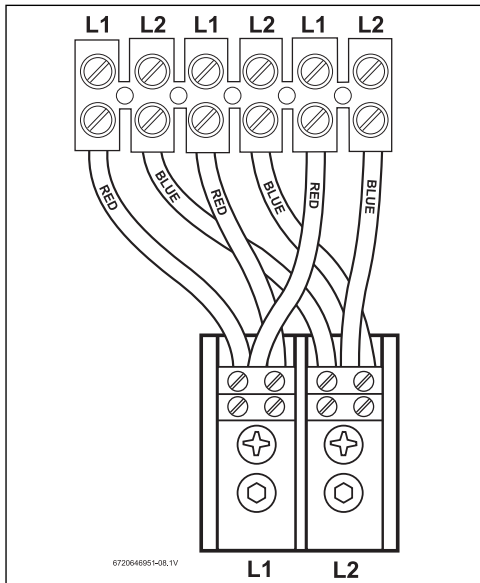


Fig. 10 For Canada only (Not for U.S.A.)

- ▶ Connect the red wires from the left hand terminal of the new block to the L1 terminals in the unit. (There are two red wires required in the WH17 and three in the WH27).
- ▶ Connect the blue wires from the right hand terminal of the new block to the L2 terminals in the unit. (There are two blue wires required in the WH17 and three in the WH27).
- ▶ Mount the auxiliary terminal block onto the provided backplate using the mounting holes.

**Connecting the supply cable - Canada only - not for the USA.**

The WH17 requires an 80A 240V AC single phase supply protected by an 80A double pole circuit breaker.



The WH27 requires a 120A 240V AC single phase supply protected by a 120A double pole circuit breaker.

- The power cable size and the installation must be in accordance with the Canadian Electrical Code, C22.1-02.
- The incoming hole diameter on auxiliary terminal block can accept up to 1/0 AWG size cables.
- The cable entry is via the 1 1/4 inch cable entry hole on the bottom right hand edge of the backplate.
- Strip back the insulation on the power wires about 1/2 inch. Connect the ungrounded conductors to the terminals "L1" and "L2" on the auxiliary terminal block.
- Any insulation on the ground wire should be stripped back about 3/4 inch. The ground lead must be connected to the pillar terminal marked "GR."
- Make sure the terminal block screws are tightened securely. Loose connections can cause wires to heat up.
- Make sure that the ground wire is wrapped around its terminal stud and into the saddle washer. The nut should be tightened securely.
- Attach the front cover, replace the white bushing with flat end facing up, replace the knob in any orientation by pushing down to secure and tighten the retaining screws.



## 4.6 Starting up

### 4.6.1 Checking for leaks and purging air

- ▶ Verify all circuit breakers supplying power to the water heater are turned off.
- ▶ Open all hot water taps supplied by the water heater and inspect all water connections for leaks.
- ▶ With all hot water taps still open, inspect each tap to ensure all air in the lines has been purged out.
- ▶ Close all hot water taps and proceed to the next section.

### 4.6.2 Adjusting the temperature dial

- ▶ The temperature dial sets the heater set-point temperature. Please note heat loss, pipe run, and other factors affect the outlet temperature at end use.
- ▶ The temperature adjustment is made using the dial on the front cover of the unit. the adjustment is between approximately 95 °F and 131 °F. Turning the dial clockwise increases the temperature setting, as indicated by the increasing temperature displayed on the unit.

### 4.6.3 Adjusting the flow

- ▶ Open fully both inlet and outlet shut-off valves at the heater, then:
- ▶ Turn on fully the highest flowing hot water faucet (e.g., bathtub) served by the water heater.
- ▶ Adjust the inlet shut-off valve until the water flow rate from the hot faucet corresponds to the value given in Fig. 11 below.

- ▶ For a licensed electrician, the unit has capability of displaying the flow rate on the front cover display. To do this, shut the circuit breakers off and remove the cover.
  - Set the small dip-switches on the display printed circuit board in fig. 12 to display flow in the units desired. The display will show these measurements as shown in table 8. Once the switch has been changed to display flow rate, place the unit cover back on and turn on the electrical breakers.
  - Fully turn on the highest flowing hot water faucet (e.g. bathtub) served by the water heater.
  - Adjust the inlet shut-off valve until the water flow rate displayed on the unit corresponds to the value given in fig. 11 below, noting any derate due to supply voltage. Derate for 208 and 220V is noted at the bottom of Table 5.
  - Shut off the hot water faucet and turn off all breakers.
  - Remove front cover by undoing the retaining screws on the front. Remove the temperature knob by pulling up with slight force. Place knob and white bushing aside, and take the cover off the heater. Then reset the circuit board switches to display temperature, as shown in fig. 12 below.
  - Place front cover back on the unit. Reinstall white bushing with flat end facing up. Attach knob in any orientation and push down to secure. Tighten cover retaining screws. Then and turn on the electrical breakers. Utilize the front knob to set the setpoint temperature of the unit.

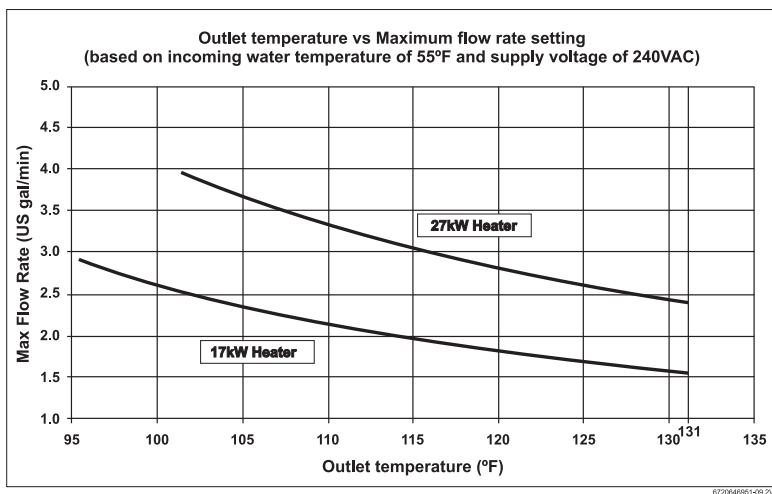



Fig. 11

For example, calculations for desired outlet temperature of 125F and supply voltage of 240VAC. Please look at Table 5 for derates of various supply voltages:

- For the WH17 unit, using the inlet valve, ensure the flow rate does not exceed 1.7 gallons/minute.
- For the WH27 unit, using the inlet valve, ensure the flow rate does not exceed 2.6 gallons/minute.

These figures are based on an inlet water temperature of 55 °F and a supply voltage of 240 volts. If the inlet water temperature is lower than 55 °F, or if the supply voltage is less than 240 volts, then the outlet temperature will be lower than what is shown in Fig. 11. If a higher outlet water temperature is desired, then reduce the flow rate and/or supply the unit with 240 volts. Please review Table 5 for derate percentage for supply voltage of 208VAC and 220VAC.



Before leaving the site, the installer should demonstrate the unit to the user and give them this manual.

American units:	95 °F (Degrees, Temperature)	1.5G (GPM flow rate)
Metric units:	35 °C (Degrees, Temperature)	5.7L (L/min flow rate)

Table 8   Appliance Display of Units

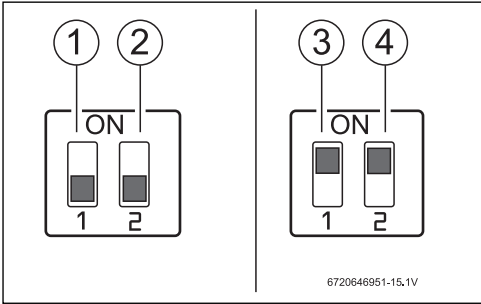



Fig. 12   Display DIP Switch


- [1]   Metric units °C & liters per min
- [2]   Display Temp
- [3]   American units °F & GPM
- [4]   Display Flow



The temperature output will be reduced if the voltage is lower than 240 volts and you may not achieve the desired output temperature.

## 5   Operation instructions


### 5.1   Before using the water heater



**WARNING:**

- ▶ Do not use the unit if you think it may be frozen, as this could result in serious damage to the unit. Wait until you are sure that it has completely thawed out before you switch it on.

- ▶ Check that the power is switched on at the circuit breaker panel.
- ▶ Turn on the hot water faucet FULLY.



The hot water temperature can be changed by adjusting the heater set-point temperature dial on the front of the unit. (The dial adjusts the temperature typically between 95°F and 131°F, as displayed in the display screen. The factory sets the temperature dial at the lowest position).

- If the unit has been used recently, run the water through for a few seconds to let the temperature cool down. You may initially get a short burst of very hot water that was in the plumbing lines from previous use.
- If a second outlet connected to the unit is also turned on, the hot water will be shared between the two.

## 6 Maintenance

### Draining the heater

Due to the shape of the heat exchangers and connecting pipe, 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:

- ▶ Disconnect electric supply.
- ▶ Disconnect cold and hot water pipes from fittings on bottom of heater. Allow water to drain out (have a catch basin ready).

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.

### Check inlet water filter screen once a year

- ▶ Check that the power is switched off at the circuit breaker panel.
- ▶ Shut off the installer supplied cold water isolation valve to the heater. If one is not installed, install before proceeding.
- ▶ Open nearest hot water tap to relieve pressure in the plumbing lines.
- ▶ Position a bucket under the cold water inlet connection of the heater to catch any water that may drain.
- ▶ Disconnect the cold water plumbing connection from the inlet (bottom right of heater) to access filter screen.
- ▶ Remove filter, clean with water and inspect for damage. If the filter is at all damaged, it should be replaced.
- ▶ Replace the filter into the inlet housing
- ▶ DO NOT leave the filter out.
- ▶ DO NOT remove the flow regulator (located behind the filter).
- ▶ DO NOT clear the filter by back flushing.
- ▶ NEVER use an air line to blow out the heater (the flow transducer will be permanently damaged).
- ▶ Before switching power back on, reconnect cold water plumbing connection and open all hot water taps and inspect each tap to ensure all air in the lines has been purged out. With the air purged and taps still flowing, turn on all circuit breakers supplying the water heater.
- ▶ Close all hot water taps and proceed for normal operation.
- ▶ The maximum flow rate may need to be set again. See section 4.6.3 for details.

Using an ohm meter to check for premature element failure



On WH17 model, there is no middle element

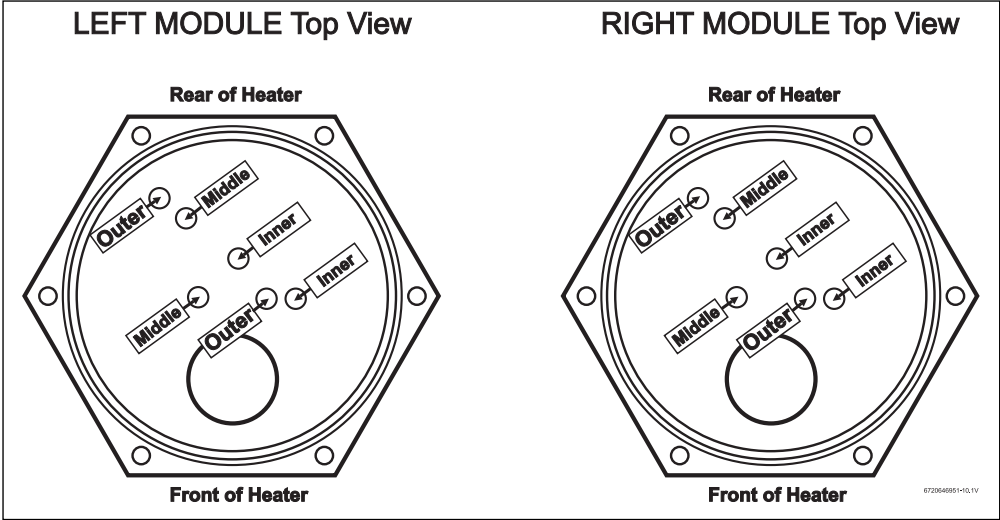


Fig. 13 Heating elements

Meter probes	Ohm Readings
Outer to Outer	10.5 ± 0.6 Ohms
Middle to Middle	11.7 ± 0.8 Ohms
Inner to Inner	15.1 ± 1 Ohms

Table 9

Meter probes	Ohm Readings
Outer to Outer	10.5 ± 0.6 Ohms
Middle to Middle	11.7 ± 0.8 Ohms
Inner to Inner	21.0 ± 1.2 Ohms

Table 10

## 7 Troubleshooting



### **DANGER:** Risk of electric shock!

- Always switch off the electricity supply to the unit before you remove the cover.

**Important:** If you are unable to perform the tasks listed below, or need additional assistance please contact your original installer/licensed electrician.



### **WARNING:**

- Before carrying out any servicing on Bosch water heaters:
- In order to prevent an unexpected or unintentional build up in water pressure inside the unit:
  - a)** Fully open the faucet nearest to the heater unit and ensure that water flows correctly. Leave this faucet fully open and then shut off the water supply to the INLET of the unit using the appropriate isolation tap.
  - b)** All checks and tests must be carried out with the unit in this state. If a check or test requires that the water is flowing, then open the INLET water isolator, always leaving the nearest outlet faucet fully open.

### **Cold water only – Neon light off**

Flow rate is too low	Verify the flow rate out of fixture is at or above the minimum activation rate required for the unit to activate. (Activation rates: WH17 = 0.6 GPM, WH27 = 0.6 GPM).
Plumbing crossover	To test for a plumbing crossover, turn off power supply to the heater. Close installer supplied cold water shut off valve (if none installed, install before proceeding). Open all hot water taps supplied by the heater. Wait 5 minutes and check all taps. Any water running is a sign of a plumbing crossover. Consult a local plumber or service person for help in correcting a plumbing crossover. To return the heater to service, reinstall cover, open the inlet water supply to the heater and open all hot water taps. Let all taps run until there is no air coming out of the fixtures. Shut off all hot water taps. Turn power supply on to the heater. Return heater to service. (This procedure will prevent the heating elements from burning out).
The flow transducer is not spinning	Turn off the power supply to the heater and remove the cover. Observe if the flow transducer "spins" when the water is turned on. Please note the flow transducer spins at a high speed and can appear to be stopped when actually spinning. It is recommended to observe the flow transducer without water flowing, then turn on a hot water tap while observing the flow transducer. If the flow transducer is not spinning, remove and flush flow transducer, noting the Do's and Don't's in → section 6 Maintenance. See the technical support section of <a href="http://www.bosch-climate.us">www.bosch-climate.us</a> for more detailed instruction on removing the flow transducer.
No electricity at the heater or one of the supplies has failed	Have a licensed electrician verify proper wiring and adequate voltage on the terminal block inside the water heater. See the "Electrical connections" section in → section 4.5 Electrical Connections, of this manual.

Table 11

**Cold water only – Neon light off**

One or more of the heating module thermal cutouts has tripped	<p>Turn off the power to the heater, remove the cover and locate the thermal cutouts on the top of each heating module. Check for continuity through each cutout. (Less than 0.5 Ohms). A continuity value greater than 0.5 Ohms indicates that the cutout has tripped or is faulty. A cutout will only trip in exceptional circumstances and it is essential that the cause is determined and resolved. Verify the heater's inlet filter screen and all outlets served by the heater are clear of debris. Ensure the heater is not being fed preheated water. This water heater is designed for cold water feed only.</p> <ul style="list-style-type: none"> <li>• The cause of the cutout tripping <b>MUST</b> be resolved.</li> <li>• <b>NEVER</b> reset the thermal cutout with the power supply still switched ON.</li> </ul> <p>Before reconnecting the power:</p> <ul style="list-style-type: none"> <li>• Fully open the faucet nearest the outlet of the heater unit so that water is flowing through the unit.</li> <li>• Then reconnect the power supply.</li> <li>• Confirm that the unit heats up correctly with the water flowing.</li> <li>• Close the isolation faucet on the INLET to the unit, leaving the outlet faucet fully open. No water should be flowing.</li> <li>• Check that no power is being drawn by any of the heating elements.</li> </ul> <p>(If power is drawn when there is no water flow then the original fault has not been cleared). Contact Technical Support 800-798-8161 for further instructions.</p>
The power supply voltage has dropped	<p>This is likely an issue with the incoming power supply. Have a qualified electrician measure voltage on the water heater's terminal block while operating at maximum flow and maximum temperature setting. The WH17 &amp; WH27 models are rated for 240V and will also operate at 220V or 208V with reduced maximum flow rate.</p>
The inlet water temperature is too cold	<p>Verify the heater is sized appropriately for it's geographic location. Turn temperature knob located on the front of the water all the way clockwise for maximum temperature setting. Ensure flow rates are within the heater's specifications. → Refer to Fig. 11 in section 4.6 Starting Up of the manual. Use of an isolation valve on the cold water inlet to control flow rate is recommended.</p>
One of the power supplies is not on	<p>Have a licensed electrician verify adequate voltage on the terminal block inside the water heater. Verify circuit breakers serving the heater are not tripped. See the "Electrical connections" section in → section 4.5 Electrical Connections of this manual.</p>
Premature element failure	<p>Have a licensed electrician Shut off power to the unit and remove cover. Use an ohm meter to verify correct resistance on each element → in Section 6 Maintenance. If readings are different than listed specifications on → in Section 6 Maintenance, tables 11 and 12, contact Technical Support 800-798-8161 for further instruction.</p>

Table 11

**Water not hot enough - Neon light on**

The water supply is connected to the outlet of the unit	Verify plumbing connections are correct (→ See Fig. 2). Reconnect the water supply to the inlet of the unit (marked blue).
One or more of the heating module thermal cutouts has tripped	<p>Turn off the power to the heater, remove the cover and locate the thermal cutouts on the top of each heating module. Check for continuity through each cutout. (Less than 0.5 Ohms). A continuity value greater than 0.5 Ohms indicates that the cutout has tripped or is faulty. A cutout will only trip in exceptional circumstances and it is essential that the cause is determined and resolved. Verify the heater's inlet filter screen and all outlets served by the heater are clear of debris. Ensure the heater is not being fed preheated water. This water heater is designed for cold water feed only.</p> <ul style="list-style-type: none"> <li>• The cause of the cutout tripping MUST be resolved.</li> <li>• NEVER reset the thermal cutout with the power supply still switched ON.</li> </ul> <p>Before reconnecting the power:</p> <ul style="list-style-type: none"> <li>• Fully open the faucet nearest the outlet of the heater unit so that water is flowing through the unit.</li> <li>• Then reconnect the power supply.</li> <li>• Confirm that the unit heats up correctly with the water flowing.</li> <li>• Close the isolation faucet on the INLET to the unit, leaving the outlet faucet fully open. No water should be flowing.</li> <li>• Check that no power is being drawn by any of the heating elements.</li> </ul> <p>(If power is drawn when there is no water flow then the original fault has not been cleared). Contact Technical Support 800-798-8161 for further instructions.</p>
Temperature dial is turned too low	Turn the temperature dial located on the front of the water heater clockwise for hotter temperatures. → Refer to Fig. 11 for outlet temperature vs. flow rate variance.
Water flow is too high	Adjust water flow to stay within the water heater's specifications. → See Fig. 11 of this manual.
Plumbing crossover	To test for a plumbing crossover, turn off power supply to the heater. Close installer supplied cold water shut off valve (if none installed, install before proceeding). Open all hot water taps supplied by the heater. Wait 5 minutes and check all taps. Any water running is a sign of a plumbing crossover. Consult a local plumber or service person for help in correcting a plumbing crossover. To return the heater to service, reinstall cover, open the inlet water supply to the heater and open all hot water taps. Let all taps run until there is no air coming out of the fixtures. Shut off all hot water taps. Turn power supply on to the heater. Return heater to service. (This procedure will prevent the heating elements from burning out).

Table 12

**Water flow too low**

There are restrictions in the plumbing	Obstructions in the water path can restrict the flow of water through the heater. Verify the heater's inlet filter screen, faucet aerators, showerheads and whole house filters are clear of debris. Verify proper flow on the inlet side of the heater with the hot water pipe disconnected. Maximum flow rates for each unit are as follows. WH17 = 2.3gpm, WH27 = 3.5gpm.
--	--

Table 13

**Water flow too low**

Water supply pressure too low	Verify incoming water supply is at least 15psi. For people on well systems, the recommended pressure range is 30-50psi.
Inlet shut-off valves are set too low	Adjust installer supplied inlet valve as described below: <ul style="list-style-type: none"> <li>• Completely open both installer supplied inlet and outlet shut-off valves at the heater. (if none installed, install before proceeding).</li> <li>• Completely open hot water on the highest flowing hot water fixture served by the heater (i.e. bathtub).</li> <li>• Slowly close the inlet shut-off valve, slowing the water flow rate until the temperature at the hot water faucet corresponds to the values given on →Fig. 11 of the manual, or desired water temperature is reached.</li> </ul>

Table 13

**Water Temperature too Hot**

Temperature dial set too high	Turn the temperature knob located on the front of the water heater counterclockwise for cooler temperatures.
There are restrictions in the plumbing	Obstructions in the water path can restrict the flow of water through the heater causing overheating. Verify the heater's inlet filter screen, faucet aerators, showerheads and whole house filters are clear of debris. Verify proper flow on the inlet side of the heater with the hot water pipe disconnected. Opening cold water isolation valve fully may be necessary. Maximum flow rates for each unit are as follows. WH17 - 2.3gpm, WH27 - 3.5gpm.
Inlet water temperature is too warm	Verify the heater is being feed with cold water only. This water heater is not designed for preheated water or recirculation applications. Increase flow rate where ever possible. Replacing low flow showerheads and aerators with higher flowing (GPM) ones may be necessary.

Table 14

**Water Temperature fluctuates**

Cold mix, heater deactivates	If inlet water temperature is over 70°F, water may be very hot out of the tap. This requires a lot of cold water to be added in order to get a usable hot water temperature. The addition of too much cold water will overpower hot water demand from the water heater. This slows the flow within the water heater, decreasing it below the activation point, which shuts off the heater. The end result is nothing but cold water coming out of the outlet. Increase the flow rate by cleaning or replacing fixtures and lower the setting on the temperature adjustment knob.
Fluctuating water pressure	If the water pressure in the home is erratic and the water flow is not consistent while a tap is opened, then the temperature of hot water will fluctuate. The minimum water pressure for the home should be 30psi or greater. For people on well systems the minimum pressure range is 30-50psi. The use of a pressure reducing/regulating valve is an effective way to maintain constant water pressure to the water heater. Watts brand 25AUB- ¾" or N35B-¾" pressure reducing/regulating valves or equivalent is suggested.
Changing flow rate. Water supply connected to the outlet of the unit.	Major changes in flow rate can adversely affect the output water temperature of the heater. Increases from one major fixture running to multiple fixtures running at one time can cause the temperature to fluctuate. Stay within the heater's specifications. →See Fig. 11.

Table 15



## 8 Spare Parts

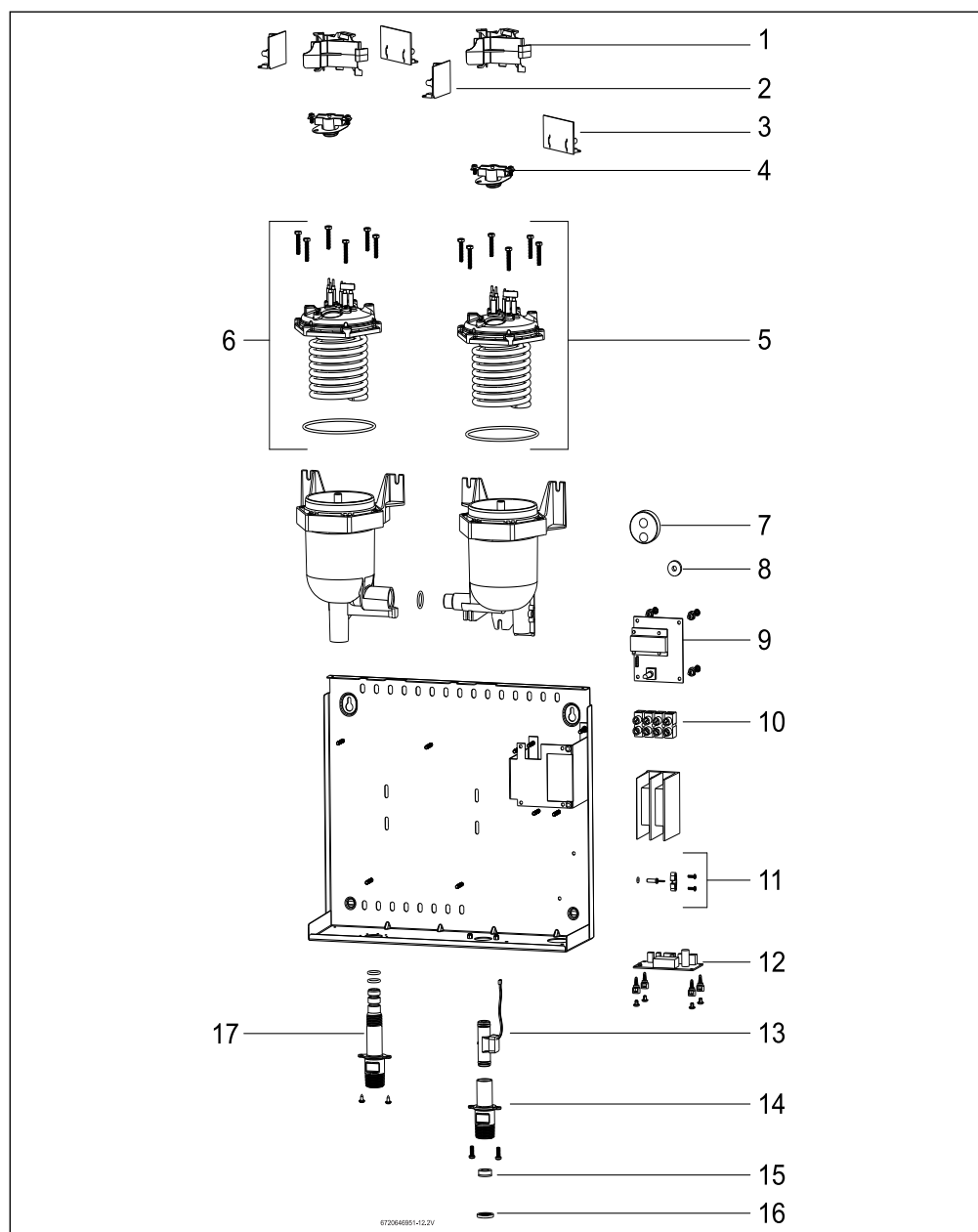


Fig. 14

#	17kW model Description	Part Number	27kW model Description	Part Number
1	PCB mount	8-738-701-722-0	PCB mount	8-738-701-722-0
2	-	-	Single Triac	8-738-701-733-0
3	Dual Triac	8-738-701-723-0	Dual Triac	8-738-701-723-0
4	1 Pole Thermal Cutout	8-738-701-727-0	2 Pole Thermal Cutout	8-738-701-740-0
5	Element Assembly 1	8-738-701-730-0	Element Assembly 1	8-738-701-737-0
6	Element Assembly 2	8-738-701-728-0	Element Assembly 2	8-738-701-736-0
7	Control Knob	8-738-710-920	Control Knob	8-738-710-920
8	Encoder Bush	8-738-710-923	Encoder Bush	8-738-710-923
9	Display PCB	8-738-710-919	Display PCB	8-738-710-919
10	4-Way terminal block	8-738-701-697-0	6-Way terminal block	8-738-701-698-0
11	Temperature Sensor	8-738-701-731-0	Temperature Sensor	8-738-701-731-0
12	Logic PCB	8-738-710-921	Logic PCB	8-738-710-922
13	MK.2 Flow transducer	8-738-701-700-0	MK.2 Flow transducer	8-738-701-700-0
14	Inlet	8-738-701-734-0	Inlet	8-738-701-734-0
15	Flow Regulator (17kW)	8-738-701-735-0	Flow Regulator (27kW)	8-738-701-739-0
16	Filter washer	8-738-701-706-0	Filter washer	8-738-701-706-0
17	Outlet	8-738-701-729-0	Outlet	8-738-701-729-0

Table 16

For further information ask your local dealer.

FOR SERVICE AND INSTALLATION QUESTIONS CALL:

Tel: 800-798-8161

Fax: 603-965-7581

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Bosch Thermotechnology Corp.

50 Wentworth Avenue

Londonderry, NH 03053

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Fax 603-965-7581

[www.boschheatingandcooling.com](http://www.boschheatingandcooling.com)

[techsupport@bosch-climate.us](mailto:techsupport@bosch-climate.us)

## Notes

For Service & Installation contact:

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