



GSW WATER HEATING
 599 Hill Street West
 Fergus, ON, Canada N1M 2X1



STORAGE TANKS FOR INSTANTANEOUS WATER HEATERS

INSTALLATION AND OPERATING INSTRUCTIONS For FlowThru® Brands

Read and understand these instructions thoroughly before starting

TABLE OF CONTENTS

I) Introduction	3
II) Safety	3
III) Installation	3
IV) Operation	5
V) Maintenance	6
Warranty	8

**PLEASE RETAIN THESE INSTRUCTIONS IN A
 SAFE LOCATION FOR FUTURE REFERENCE**



⚠ WARNING:

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information, consult a qualified installer, service agency or the electric utility.

⚠ FOR YOUR SAFETY

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Installation and service must be performed by a qualified installer, service agency or the electric utility.

⚠ WARNING:

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



INSTALLATION RECORD

Record key data here for future reference and prompt service:

Installed By / Purchased From		
Installation Date	Location of Electrical Switch or Circuit Protector	
Model Number	Serial Number	
Circulator Pump Type	Boiler/Water Heater BTU Input	
Volts	P.S.I.	U.S. Gal.

I) INTRODUCTION

Thank you for purchasing this FlowThru® storage tank. Properly installed and maintained, it will provide years of trouble free service.

The warranty on this storage tank is in effect only when the tank is installed and operated in accordance with these instructions. The manufacturer of this tank will not be liable for any injury or property damage resulting from failure to comply with these instructions.

IMPORTANT: Read and understand these instructions before installing and operating your storage tank.

Description

The FlowThru® series of storage tanks have been designed to supply hot water for domestic use when combined with a tankless coil boiler or instantaneous water heater (IWH). Each tank is equipped with an adjustable thermostat, pre-wired and ready for connection to a circulator pump (not supplied). These tanks are not constructed to ASME requirements and should not be used for such applications. The FlowThru® series of storage tanks has been optimized to maximize hot water flow rate capabilities of an instantaneous water heater or tankless coil boiler. They provide a faster recovery than regular electric or gas-fired tank type water heaters of the same storage capacity. Always use a mixing valve on the hot water outlet (not provided).

II) SAFETY

Relief Valve Requirements

For protection against excessive temperatures and pressure, install temperature and pressure protective equipment required by local codes, but no less than a combination Temperature and Pressure (T&P) Relief Valve certified as meeting the requirements for “**Standard For Relief Valves For Hot Water Supply Systems, ANSI Z21.22/CSA 4.4**”. The valve shall be marked with a maximum set pressure not to exceed the maximum working pressure of the storage tank. The T&P valve shall be rated for the BTU INPUT of the entire system. This T&P valve may be in addition to any T&P valve that is required on the boiler or instantaneous water heater system. Install the valve into the opening provided on the storage tank, or other approved system location. Provide tubing so that any discharge from the valve will exit within 152mm (6 in.) above, or any distance below the structural floor and cannot contact any live electrical part. The end of the relief pipe opening should terminate near the floor drain or other suitable location. Do not place a valve(s) or any other blockage or restrictions between the tank and the T&P valve.

III) INSTALLATION



WARNING

Excessive Weight Hazard

Use two or more people to move and install storage tank. Failure to do so can result in back or other injury.

Local Codes

The installation of this storage tank must be in accordance with these Instructions and all applicable local codes.

Location

Locate the storage tank in a clean dry area close to the water-heating source and preferably central to the piping system. Adequate clearance for accessibility to permit maintenance and service must be provided. Water lines and the storage tank should be protected from freezing temperatures. Do not install the storage tank in outdoor unprotected areas. It is necessary to have a floor drain nearby to permit easy draining (see Figure 1).

IMPORTANT

This storage tank must be installed strictly in accordance with the instructions enclosed, and local electrical, fuel and building codes. It is possible that connections to the tank, or the tank itself, may develop leaks. IT IS THEREFORE IMPERATIVE that the storage tank be installed so that any leakage of the tank or related water piping is directed to an adequate drain in such a manner that it cannot damage the building, furniture, floor covering, adjacent areas, lower floors of the structure or other property subject to water damage. This is particularly important if the tank is installed in a multi-story building, on finished flooring or carpeted surfaces. GSW WILL NOT ASSUME ANY LIABILITY for damage caused by water leaking from the storage tank, pressure relief valve, or related fittings. Select a location as centralized within the piping system as possible. In any location selected, it is recommended that a suitable drain pan be installed under the storage tank. This pan must limit the water level to a MAXIMUM depth of 45mm (1 3/4 in.) and have a diameter that is a minimum of 50mm (2 in.) greater than the diameter of the storage tank. Suitable piping shall connect the drain pan to a properly operating floor drain.

Circulator Pump

A circulator pump is not supplied. Use only a bronze body model rated for 110/120 volts, 60Hz. Install in accordance with the pump manufacturer's instructions using standard plumbing practices. Size the circulator pump taking into account the pressure loss through the tankless coil boiler or instantaneous water heater as well as pressure losses through the connecting pipes that are part of the circulating loop.

Sizing The Hot Water System

Temperature of the system is controlled by the temperature set point of the instantaneous water heater or boiler coil. Given the limited storage capacity of the storage tank and the maximum output of the tankless coil boiler or instantaneous water heater, large hot water draws significantly exceeding the circulating loop flow rate may lead to a reduction in temperature of hot water delivered.

Plumbing Connections

⚠ WARNING

The water heating source piping and components connected to the tank must be suitable for potable water use. TOXIC chemicals such as used for boiler treatment must not be introduced into the tank.

For a temperature controlled instantaneous water heater it is recommended to install the plumbing as shown in Figure 2. It is also recommended to set-up and control the IWH outlet temperature to be at least 11°C (20°F) above tank thermostat temperature. The recommended plumbing installation for a tankless coil boiler is shown in Figure 3. In this case, because the tankless coil boiler is able to control only the differential between inlet and outlet temperature, the cold water entering the tankless coil boiler must be tempered with hot water from the storage tank. As there is a large variety of heat sources and control systems, please contact your local distributor for the plumbing system to identify the solution that best suits your application.

Important

Do not apply heat directly to tank fittings when making sweat connections. They contain non-metallic material.

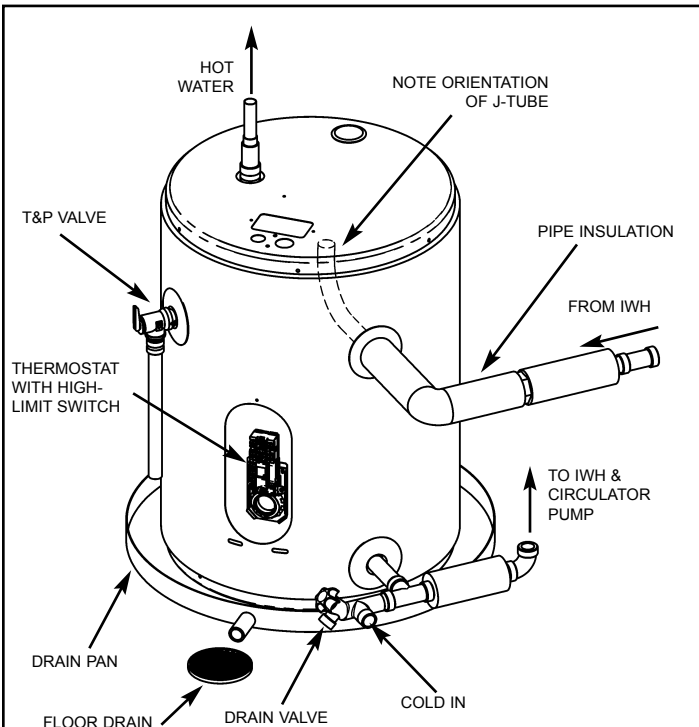


Figure 1 Main Parts and Features for Connection to a Temperature Controlled IWH

1. Ensure the storage tank is level before starting installation.
2. Install a circulation loop as shown using 19mm (3/4 in.) copper piping.
3. If the heating source is a tankless coil boiler go to step 4. If a temperature controlled IWH is used as a heat source, install the combination inlet/drain valve in one "arm" of a tee connected to the lower storage tank fitting. Connect the cold water supply piping to the inlet of the combination inlet/drain valve. Connect the other "arm" of this tee to the IWH inlet line and place the circulating pump in this line. Connect the IWH outlet to the upper storage tank side fitting (see Figure 2). Proceed to step 5.
4. For a tankless coil boiler install the combination inlet/drain valve in the lower storage tank fitting. Connect the inlet of the combination inlet/drain valve to the hot outlet of the tankless coil boiler. In this instance the "leg" of a tee should connect to the cold water supply line, one "arm" connects to the circulator pump and the other "arm" to the inlet of the tankless coil boiler. The circulator pump connects to the upper side fitting of storage tank (see Figure 3).

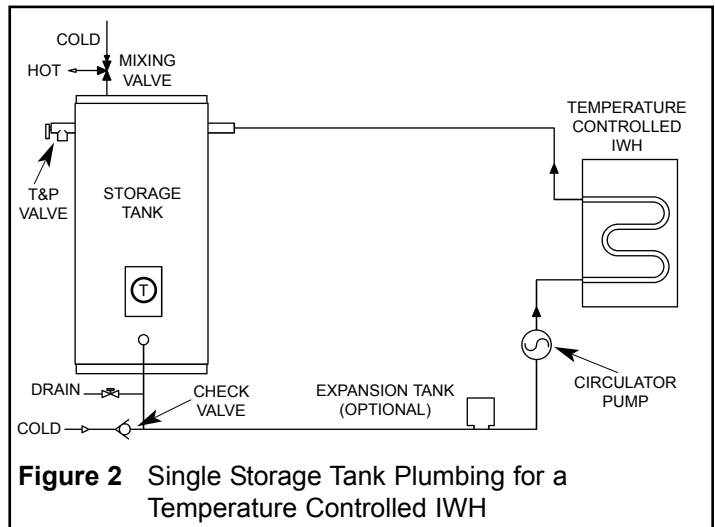


Figure 2 Single Storage Tank Plumbing for a Temperature Controlled IWH

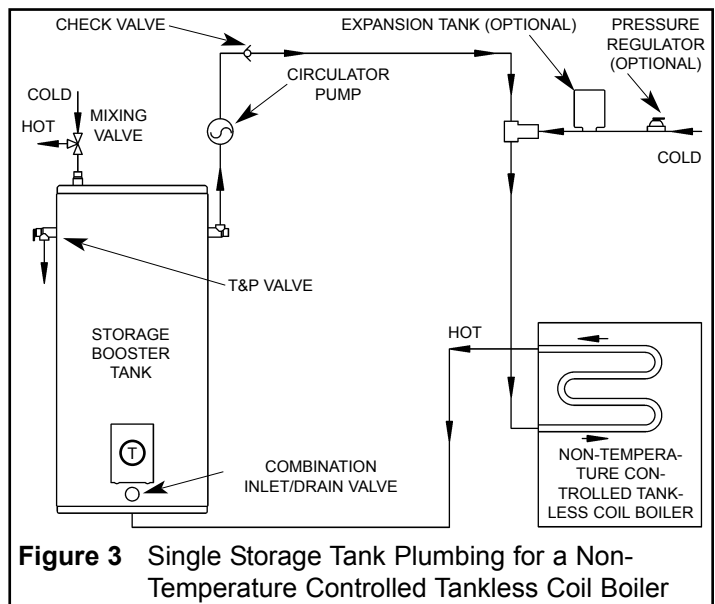


Figure 3 Single Storage Tank Plumbing for a Non-Temperature Controlled Tankless Coil Boiler

5. Pay attention to the desired flow direction when installing the circulator pump. If the pump does not have a check valve embedded install one to ensure the desired flow direction is maintained during system operation.
6. Install a mixing valve with the hot port going to the top tank fitting. Connect the domestic hot water supply line to the mixing port of the mixing valve. Connect the cold port of the mixing valve to the cold water supply line and place a shut-off in this line. Most mixing valves do not operate properly if the pressure differential between hot and cold port is too high. If this happens, lower mixed water temperature will be provided. The shut-off valve should be used to adjust this pressure differential. Set the mixing valve outlet temperature to 49°C (120°F) to avoid scalding.
7. A check valve may be installed in the cold water line before the connecting tee.

NOTE: The check valve can often be noisy and cause reduced supply pressures. For multiple storage tank systems, check valves must be installed to prevent the circulator pump from pumping hot water into another tank and overheating it.

8. The use of a pressure regulator is optional, but recommended when the cold supply pressure is over 80 psi. Reducing the inlet pressure to 45-60 psi will reduce probability of relief valve discharge due to thermal expansion.
9. The water utility supply meter may contain a check valve, back-flow preventer or water pressure-reducing valve. This will create a closed water system. During a heating cycle, water expands creating a pressure buildup in the water system. A Temperature and Pressure (T&P) Relief Valve must be installed (150 psi maximum pressure). See preceding section. If the T&P valve discharges periodically, it may be due to thermal expansion in a closed system. To prevent this condition and to reduce the possible buildup of lime on the T&P Relief Valve seat, install a thermal expansion tank in the circulating loop as shown in Figure 2 and 3.
10. Some jurisdictions require a Vacuum Relief Valve to be installed. Such a valve allows air to enter the piping system thus preventing vacuum conditions that could siphon water from the system. Check local code requirements.

Electrical Wiring

Electrical wiring must be in accordance with local codes or, in the absence of such codes, with the “**Canadian Electrical Code, Part I, (C22.1)**” or the “**National Electrical Code, (NFPA 70)**” as applicable.

1. Supply 110/120 volts, 60Hz power, to the junction box located at the top of the tank.
2. Connect the circulator pump in series with the thermostat as shown in Figure 4.
3. A ground wire must be supplied from the ground connection at the service panel to the ground screw at the junction box.

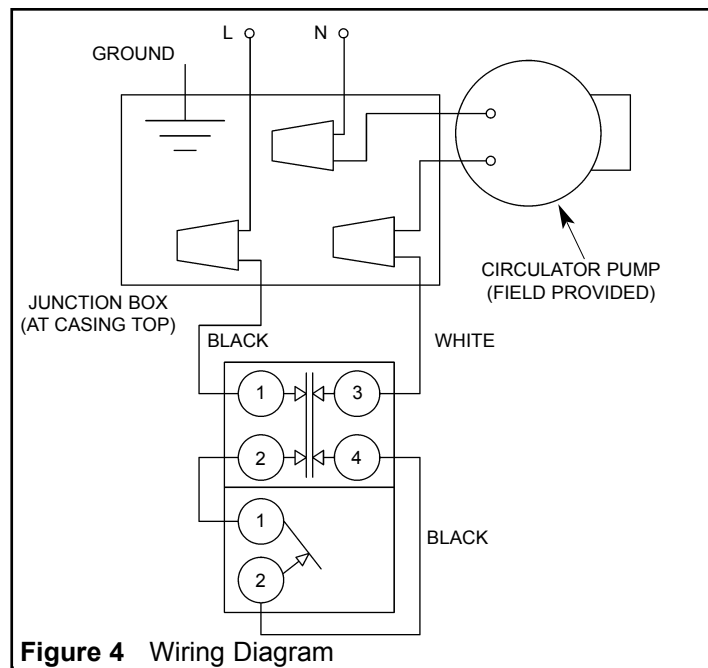


Figure 4 Wiring Diagram

4. The thermostat is rated for a maximum inductive current of 7 FLA at 120 VAC. Do not exceed this rating for the circuit.
5. Do not install or connect electrical heating elements to this tank.

Filling

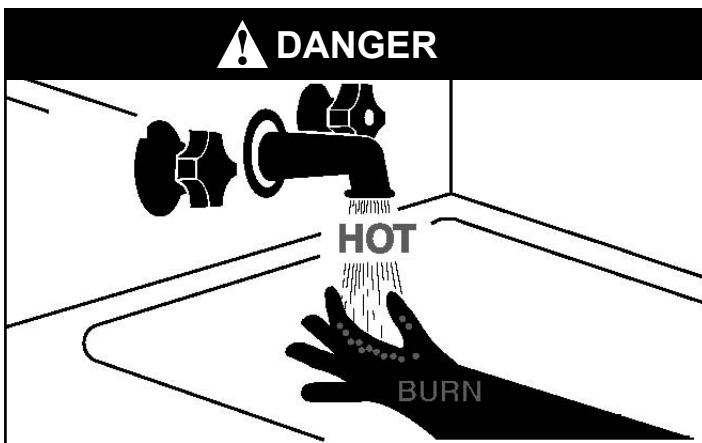
NOTE: When filling, avoid water leakage. Do not allow the insulation of the tank to get wet as water can cause electrical malfunction or reduce the effectiveness of the insulation.

1. To insure complete filling of the tank, allow air to exit by opening a hot water faucet that is served by the tank and is some distance away from the heater.
2. Ensure the storage tank drain valve is closed.
3. Open the cold water supply valve and fill the tank and piping system with water. When an uninterrupted stream of water, without apparent air bubbles, flows from the open hot water faucet, the system is full.
4. Close the open hot water faucet. Check the system for leaks, repair as necessary and retest.
5. Connect a hose to the drain valve and route to a suitable drain. Open the drain valve and let water run to flush out any foreign matter that may have entered the system. Once flushed, close the drain valve and disconnect hose.

IV) OPERATION

1. Follow boiler or instantaneous water heater installation and operating instructions.
2. Fill the tank (see “Filling” section).
3. The boiler or instantaneous water heater should be set to provide at least 11°C (20°F) higher water temperature than the temperature setting of the storage tank.
4. Turn power on, check for proper operation of boiler or instantaneous water heater and storage tank.

Temperature Adjustment



Water temperature over 52°C (125°F) can cause severe burns instantly or death from scalds.

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

See instruction manual before setting temperature at the storage tank.

Feel water before bathing or showering.

Temperature limiting valves are available, see manual.

Thermostats are factory set at 140°F (60°C). The thermostat operates automatically. It can be adjusted to provide a higher or lower water temperature.

If water temperature adjustment is required:

1. Turn the electrical supply "OFF".
2. Remove the access door and insulation pad.
3. Check with a voltage tester at terminal 1 and 3 of the limit control that power is indeed "OFF".
4. Adjust the thermostat to the water temperature desired.
5. Ensure insulation pad is in the door cavity. Replace access door(s).
6. Turn the electrical supply "ON".

⚠ WARNING: Risk of scalding

There is a hot water scald potential if the thermostat is set too high.

Adjusting the thermostat past the 49°C (120°F) bar on the temperature dial will increase the risk of scald injury. Hot water can cause severe burns in:

- 1 1/2 seconds at 66°C (150°F)
- 3 seconds at 60°C (140°F)
- 20 seconds at 54°C (130°F)

Initial Temperature Adjustment

1. For the temperature controlled IWH, ensure the temperature set point is 11°C (20°F) higher than the storage tank set point.

2. If at the end of the recovery cycle, the IWH is OFF but the circulator pump does not turn OFF automatically, reduce the storage tank thermostat set point until the pump shuts off. Check that pump is off.

Temperature Limit Control

For safety, a non-adjustable high limit temperature switch will shut off the power when excessive water temperatures are reached. This switch must be re-set manually.

V) MAINTENANCE

Temperature and Pressure Relief Valve

Manually operate the temperature and pressure relief valve at least once a year to make sure it is working properly. To prevent water damage, the valve must be properly connected to a discharge line that terminates at an adequate drain.

⚠ CAUTION

The out-flowing water is hot. Avoid splashing the water on yourself or on the surroundings where it may cause damage.

Standing clear of the outlet (discharged water may be hot), slowly lift and release the lever handle on the temperature and pressure relief valve (see Figure 5) to allow the valve to operate freely and return to its closed position. If the valve fails to completely reset and continues to release water, immediately turn "OFF" the electrical supply to the tank, close the cold water supply valve and call a qualified service technician.

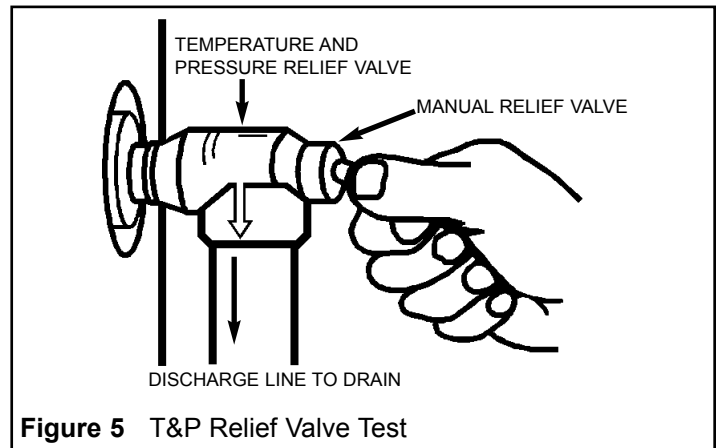


Figure 5 T&P Relief Valve Test

Draining and Flushing

It is recommended that the storage tank be drained and flushed every 6 months to remove sediment that may build up during operation. The storage tank should also be drained if being shut down for extended periods of time. To drain the tank, perform the following steps:

⚠ CAUTION

The water being drained can be extremely hot! The drain hose should be rated for at least 93°C (200°F). If the drain hose does not have this rating, open the cold water supply valve and a nearby hot water faucet served by the system until the water flow is no longer hot. Close the cold water supply valve and resume.

1. Turn "OFF" the electrical supply to the tank.
 2. Close the cold water supply valve.
 3. Open a nearby hot water faucet served by the system.
 4. Connect a hose to the drain valve and route it to an adequate drain.
 5. Open the drain valve and allow all the water to drain from the tank.
 6. Open the cold water supply valve and flush the tank as needed to remove sediment and any other foreign matter that may have entered the system. Close the cold water supply valve when clean water flows.
 7. Perform any other servicing as required.
 8. Close the drain valve, disconnect hose and refill the tank (see "Filling" section). If the water heater is going to be shut down for an extended period, the drain valve should be left open.
 9. Turn "ON" the electrical supply to the tank.
5. Using an adjustable pipe wrench, remove the anode and inspect it. The surface may be rough, full of pits and crevices, but this is normal. If it is less than approximately 6mm (1/4 in.) in diameter, or the inner steel core is exposed, the anode should be replaced.
 6. Apply Teflon™ tape or sealing compounds approved for use with potable water, to the threads of the anode and install into the tank top.
 7. Open the cold water supply valve and open a nearby hot water faucet to purge air from the tank as directed in the "Filling" section.
 8. Check for leaks, repair as required, and re-test.
 9. Turn "ON" the electrical supply to the tank.

Water Odor/Sacrificial Anode

Your storage tank has been equipped with one magnesium anode that will slowly deplete while protecting the glass-lined tank thus prolonging its life. Certain water conditions may cause a reaction between the anode and the water. The most common complaint associated with the anode is a "rotten egg smell" produced by the presence of sulfur. **Do not remove this anode permanently as it will void any warranties, stated or implied.** An aluminum anode may reduce if not eliminate water odor problems. The water supply system may require special filtration equipment from a water conditioning company to successfully eliminate all water odor problems. Artificially softened water is exceedingly corrosive because the process substitutes sodium ions for magnesium and calcium ions. The use of a water softener may decrease the life of the water heater tank. The anode should be inspected periodically. If the anode is more than 50% depleted, the anode should be replaced.

Anode Maintenance

1. Turn "OFF" the electrical supply to the tank.
2. Close the cold water supply valve.
3. Open a nearby hot water faucet served by the system to depressurize the system.
4. Connect a hose to the drain valve and drain 22 litres (6 gal.) as directed in the "Draining and Flushing" section.

CAUTION

Hydrogen gas can be produced in a hot water system served by this storage tank that has not been used for a long period of time (generally two (2) weeks or more). **Hydrogen gas is extremely flammable and can ignite when exposed to a spark or flame.** To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. Use caution in opening faucets. If hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. There should be no smoking or open flame near the faucet at the time it is open.

~ Certificate of Warranty ~

See Rating Label Serial Number prefix for Warranty Code. Reduced warranty period applies to Newfoundland.

Warranty Code:	P	R	S	T	U	V	W	Y
Standard Warranty Years:	3	5	6	7	8	9	10	12
Reduced Warranty Years:	2	3	3	5	5	5	5	7

For its GSW and John Wood water heaters and storage boosters ("Unit"), GSW Water Heating ("GSW") warrants that, upon receipt of a properly verified Warranty claim within the Warranty Period, it will, at its election, repair or replace: units which leak or parts which are defective in material or workmanship, subject to the terms and conditions set forth in this certificate. GSW will not assume any expense or liability for unauthorized returns, nor repairs made by a person who has not been authorized by GSW or one of its authorized dealers. GSW Units/parts must be replaced with GSW or John Wood products to be eligible for Warranty. This Warranty is available to the original owner of a Unit installed within the boundaries of continental United States, of Canada, or their territories. **Consumers must retain point-of-sale proof of purchase to validate warranty entitlement.** This Warranty does not cover components not manufactured by GSW, such as oil burners, which carry the warranty given by the manufacturer thereof, copy of which warranty GSW will make available, to the extent supplied by the manufacturer, without recourse to GSW.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THIS EXPRESS WARRANTY IS, WHERE PERMITTED BY LAW, IN LIEU OF AND EXCLUDES AND REPLACES ALL OTHER CONDITIONS, WARRANTIES, GUARANTEES, REPRESENTATIONS, OBLIGATIONS OR LIABILITIES OF GSW OF ANY NATURE OR KIND, EXPRESS OR IMPLIED, HOWEVER ARISING (WHETHER BY CONTRACT, CONDUCT, STATEMENT, STATUTE, NEGLIGENCE, PRINCIPLES OF MANUFACTURER'S LIABILITY, OPERATION OF LAW OR OTHERWISE) WITH RESPECT TO THE UNIT OR ITS FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INSTALLATION, OPERATION, REPAIR OR REPLACEMENT. GSW EXPRESSLY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES. IN NO EVENT WILL GSW'S LIABILITIES EXCEED THE COST OF THE DEFECTIVE PART(S) OR UNIT. GSW WILL NOT PAY FOR ANY TRANSPORTATION, LABOUR, INSTALLATION, OR OTHER INCIDENTAL COSTS ASSOCIATED WITH THE REPAIR OR REPLACEMENT OF A DEFECTIVE PART OR UNIT.

This warranty and GSW's obligations shall be construed and determined in accordance with the laws of both the Province of Ontario, and of Canada in force therein. This Warranty does not affect specific legal rights of a consumer under applicable law, except to the extent that such rights may be waived or replaced, and the provisions hereof are deemed to be amended to the extent necessary. The unenforceability of any provision, in whole or in part, of this Certificate shall not affect the remaining provisions. Any and all repair and/or replacement of part(s) or Unit are the sole and exclusive remedy available against GSW.

LIABILITY OF GSW COVERED BY THIS WARRANTY IS CONDITIONAL UPON THE FOLLOWING:

1. The Unit shall be installed in accordance with all manufacturers' instructions, all applicable equipment and building codes, ordinances and regulations (hereinafter referred to as the "standards").
2. The Unit must not be installed where water damage can result from a leak, while provision(s) shall be made for directing any water escaping from the Unit, to a properly operating drainpipe. As all units of this type may eventually leak, you must protect against any potential water damage. GSW accepts no responsibility for such damage, nor any incidental or consequential loss, nor damage(s) related thereto, suffered by the owner of the Unit nor by any third party.
3. The Unit shall not be installed where it will be exposed to adverse or unusual environmental or corrosive conditions. No warranty extends, for example, and without limitation of the foregoing, to Units exposed to: salts; chemicals; exhausts; pollutants or contaminants. Further, no warranty extends to Units affected by fire, freezing or flood, "Acts of God", or any other contingency beyond the control of GSW.
4. The Unit shall be equipped with a properly operating temperature and pressure relief valve as specified by GSW and applicable standards. The Unit shall be operated at temperatures not exceeding the maximum setting of the thermostat and/or high limit control provided by GSW, and at water pressures not exceeding the pressure reading stated on the Unit.
5. The Unit must be carefully inspected, maintained, and operated in accordance with the manufacturer's instructions. No warranty extends, for example, and without limitation of the foregoing, to any Unit operated: without the tank being completely filled with water; without an operating anode; with levels of sediment or lime precipitate which cause failure; in connection to any attachment(s), energy saving device(s), or other means of heating, except as approved by GSW for the Unit; other than with potable water without any additives such as salts, chlorine or chemicals, except those added for the sole purpose of rendering the water fit for domestic use.
6. All repairs must be made by a competent and qualified person who is certified, by GSW or one of its authorized dealers, to work on the Unit, using factory approved replacement parts, and the Unit shall not be otherwise modified, altered or improperly repaired.
7. A properly documented claim shall be received by GSW or one of its authorized dealers, or point of purchase, within the following Warranty Period, except as provided otherwise below*:
 - a) for any defective part, within one (1) year; or
 - b) for any Unit that develops leaks in the inner tank due to rust, corrosion or other chemical reactions caused by the potable domestic water supplied to your home, within the period of time shown in table at the top of this page.

* Residential units installed and used in a commercial application carry a warranty period of one (1) year from date of installation; and, Any repair or replacement of any part, tank, or Unit under this Warranty will not extend the Warranty Period beyond that calculated from the date of first installation of the original Unit. The date of first installation will be deemed to be the later of the date indicated by the Unit's serial number, or if supplied with the Warranty claim, the sales receipt, or installer's receipt.
8. A claim under this Warranty must include the model and serial number of the Unit, proof of date on which the Unit was first installed, and the identity of the defective part(s) for which a claim is being made and be submitted within 15 days following discovery of the defect(s), by personal delivery to a GSW authorized dealer, point of purchase, or GSW itself at:

GSW Water Heating
GSW Water Heating is a division of GSW Water Products Inc.
599 Hill Street West
Fergus, ON Canada N1M 2X1

Should you have questions, please call our Technical Support Line at **1-888-479-8324**.
9. If requested by GSW, information relating to the purchase, transportation, operation and installation of the Unit must be supplied. The defective part(s) or Unit, with all components properly and securely packed, shall be returned transportation pre-paid, to the address designated by GSW in the written request. All claims are subject to validation by GSW.

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