



# Infinion C13 Installation and Operation Manual

## NOTICE TO INSTALLER

Affix these instructions adjacent to the Infinion.

## NOTICE TO OWNER

Keep these instructions for future reference. For additional information, call 1 (800) 247-3619.

### WARNING

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



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 gas supplier.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

### FOR YOUR SAFETY

Do not store or use gasoline or other flammable, combustible or corrosive vapors and liquids in the vicinity of this or any other appliance. Doing so may result in an explosion or fire.

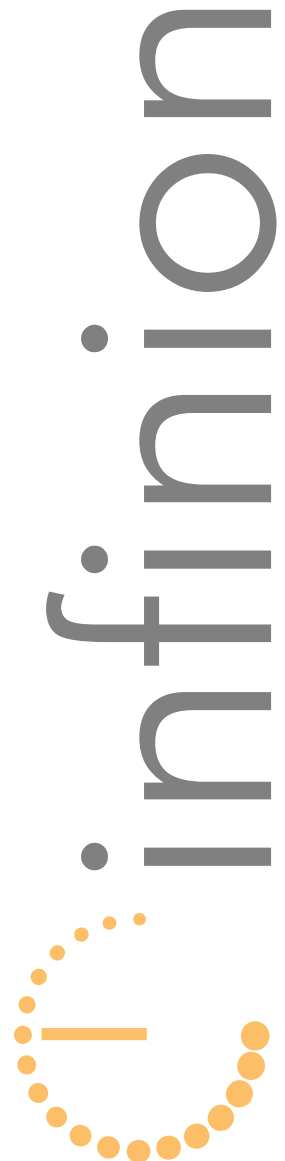
### WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch or use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone.
- Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.
- Do not return to your building until authorized by the gas supplier or fire department.

Distributed Exclusively By

#### Akwakai

7683 SE 27th St., #294  
Mercer Island, WA 98040  
(800) 247-3619



# General Safety Precautions

Read and understand this entire manual before installing or operating your Infinion water heater. Pay particular attention to the following General Safety Precautions. Failure to follow these warnings could result in a fire or explosion, causing property damage, bodily injury or death. If you have any problems understanding the instructions in this manual, STOP, and get help from a qualified installer or service technician, the gas supplier or Infinion technical support at (800) 247-3619.

## WARNING

### *Flammable Materials*

Gasoline, as well as other flammable materials and liquids (adhesives, solvents, etc.), and the vapors they produce, are extremely dangerous. **DO NOT** handle, use or store gasoline or other flammable or combustible materials anywhere near a water heater. Read and follow the warning label pictured below and other labels on the water heater, as well as the warnings printed in this manual. Failure to do so can result in property damage, bodily injury, or death.



## DANGER

### *Venting*

Failure to properly vent the water heater to the outdoors as outlined in the Venting Section of this manual (page 12) can result in unsafe operation of the water heater. To avoid the risk of fire, explosion, or asphyxiation from carbon monoxide, never operate this water heater unless it is properly vented and has an adequate air supply for proper operation. Inspect the vent system for proper installation at initial start-up; and at least annually thereafter. Refer to Maintenance section of this manual for more information regarding vent system inspections

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# General Safety Precautions



## DANGER

### Liquid Propane

**LIQUEFIED PETROLEUM MODELS - Propane, or LP gas, must be used with great caution.**

- It is heavier than air and will collect first in lower areas making it hard to detect at nose level.
- Check for LP leaks before lighting the heater. Use a soapy solution to check all gas fittings and connections. Bubbling at a connection indicates a leak that must be corrected. When smelling to detect an LP leak, be sure to sniff near the floor too. Gas detectors are recommended in LP applications and their installation should be in accordance with the manufacturer's recommendations and/or local laws, rules, regulations or customs.
- It is best to use more than one method to detect leaks in LP applications.

**IF LP GAS IS PRESENT OR SUSPECTED:**

- DO NOT attempt to find the cause yourself;
- DO NOT try to light any appliance;
- DO NOT touch any electrical switch;
- DO NOT use any phone in your building.
- Leave the house immediately and make sure your family and pets leave also.
- Leave the doors open for ventilation and contact the gas supplier, a qualified service agency or the fire department.
- Keep the area clear until the service call has been made, the leak is corrected, and a qualified agency has determined the area to be safe.



## WARNING

### Gas Odor

**Both LP and natural gas have an odorant added to help detection. Some people may not be able to smell or recognize this odorant. If unsure or unfamiliar about the smell associated with LP or natural gas, ask the gas supplier. Other conditions, such as "Odorant Fade", which causes the odorant to "fade", or diminish in intensity can also hide or camouflage a gas leak.**

# General Safety Precautions



## WARNING

### Fuel Type

Water heaters utilizing Liquefied Petroleum gas (LP) are different from natural gas models. A natural gas heater will not function safely on LP gas and vice versa. To avoid possible equipment damage, personal injury or fire: **DO NOT** connect this water heater to a fuel type not in accordance with unit data plate. Use propane for propane units; natural gas for natural gas units. These units are not certified for any other type fuel.



## WARNING

### Location

Do not install LP appliances below-grade (for example, in a basement) if such installation is prohibited by federal, state and/or local laws, rules, regulations or customs.

If installation in a garage is the only alternative, mount the heater so that the open flame of the pilot and main burner are no less than 18 inches above the floor. Raising the heater will reduce but not eliminate the possibility of vapors from any improperly-stored or accidentally-spilled flammable liquids.



## DANGER

### Water Temperature

**WATER TEMPERATURE ADJUSTMENT** - Consider safety and energy conservation when selecting the heater's output water temperature. Water temperatures above 125°F. can cause severe burns or death from scalding. Read and follow the warnings outlined on the label pictured below. **NOTE:** Households with small children, disabled, or elderly persons may require a 120°F. or lower output temperature to prevent contact with "HOT" water. Test the water temperature by turning on a hot water faucet, placing a thermometer in the hot water stream, and reading the thermometer.



## Danger

Water temperature over 125°F can instantly cause severe burns or death from scalding. Risk is highest for children and disabled or elderly people. See Operation Manual for help on setting safe water temperature.

# General Safety Precautions

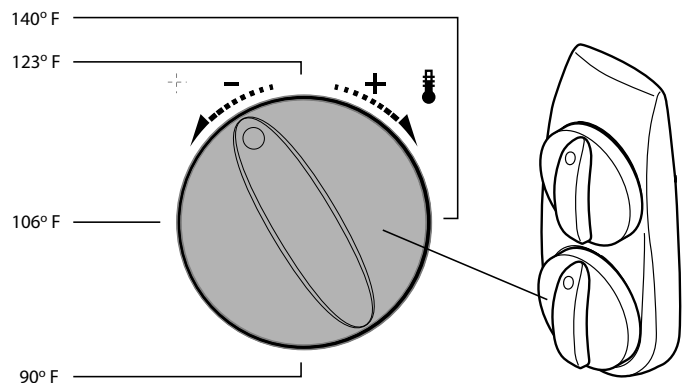
## Water Temperature continued

Use the following chart as a guide to determining the proper water temperature for your home.

Water Temperature	Time to Produce Serious Burn
120° F	More than 5 minutes
125° F	1 1/2 to 2 minutes
130° F	About 30 seconds
135° F	About 10 seconds
140° F	Less than 5 seconds
145° F	Less than 3 seconds
150° F	About 1 1/2 seconds
155° F	About 1 second

Adjust the outlet water temperature of the heater by setting the temperature dial on front of the Infinion. The illustration below shows the approximate water temperature for each position of the temperature dial.

There is a Hot Water SCALD Potential if the temperature knob is set too high. Mixing valves for reducing point of use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber, the local plumbing authority, or Akwakai for further information.



Note - These temperature values are approximate. Flow rate and other factors will affect your actual results

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# General Installation Guidelines

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## Introduction

**Read and Review this entire Manual with special emphasis on the Venting Section (Page 12) and Operation Section (Pages 17 - 19) prior to any installation work.**

- Follow these instructions when you install your heater. In the United States: The installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code ANSI Z223.1/NFPA 54. In Canada: The Installation should conform with CGA B149.(1,2) INSTALLATION CODES and /or local installation codes.
- Carefully plan where you install the heater. Correct combustion air supply and flue pipe installation are very important. If not installed correctly, fatal accidents can be caused by lack of air, carbon monoxide poisoning or fire.
- Install the heater in a location with enough ventilation. The National Fire Codes prohibit water heater installation in bathrooms, bedrooms or any occupied rooms normally kept closed. See the section below on locating the heater.
- You must vent your heater. See section on Vent Pipe Connections, Page 12.
- Disconnect the heater from the gas supply piping system during any pressure testing at pressures in excess of ½ Psig (3.5 kPa).
- Isolate the heater from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than ½ Psig (3.5kPa). Test the appliance and its gas connection before operating the heater.
- Keep water heater area clear and free from combustibles and flammable liquids. Do not locate the heater over any material that might burn.
- Correct gas pressure is critical for the optimum operation of this heater.
- Size gas piping to provide the required pressure at the maximum output of the heater, while all the other gas appliances are in operation. Check with your local gas supplier, and see the section on connecting the gas supply (page 13 ).
- If overheating occurs or the gas supply fails to shut off, turn off the gas supply at the manual gas shut off valve on the gas line.
- Do not use this appliance if any part has been underwater. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system that has been underwater.

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# General Installation Guidelines

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## Locate Your Heater

Carefully select the location of your new heater. For your safety and for proper heater operation, you must provide an abundant supply of combustion air and a proper venting installation. The heater may still operate even if improperly vented. However, it will be less efficient and could eventually become damaged. It could even result in human sickness or death due to oxygen deprivation and carbon monoxide poisoning. Follow the guidelines below:

- Install your heater as close to a vent or chimney as possible.
- Do not install this appliance in bathrooms, bedrooms, unvented closet or any occupied rooms normally kept closed.
- Simultaneous operation of other appliances such as exhaust fans, ventilation systems clothes dryers, fireplaces or wood stoves could create a vacuum effect in your home which could cause dangerous combustion by-products to spill back into your home rather than venting to the outside through the flue. Confirm that your Infinion is venting properly when all these other appliances are running. See section on venting. Do not obstruct the flow of combustion and ventilation air to the appliance. If installed near to a clothes dryer it is very important that the dryer be properly vented. Failure to properly vent a dryer could result in a gradual accumulation of lint in the heat exchanger fins or in the burners, leading to a dangerous condition of venting blockage and poor unsafe combustion.
- Keep your hot water lines short to save energy. Insulated hot water lines are best.
- **WARNING: DO NOT INSTALL THE HEATER WHERE IT COULD FREEZE.** This heater is neither designed for nor approved for outside installation.
- **WARNING:** Do not install the heater where flammable materials, gasoline, pressurized containers, or any other items or articles that are potentially fire hazards are stored or used. Keep the appliance area free of all combustible materials, gasoline and other flammable vapors and liquids.

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# General Installation Guidelines

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## Provide Adequate Combustion Air

Observe the following instructions concerning combustion air.

Appliances located in **unconfined** spaces:

- An unconfined space is one whose volume is greater than 50 cubic feet per 1000 Btu per hour of the combined rating of all appliances installed in the space. That would be 5250 cubic feet for just the Infinion C13.
- In unconfined spaces in buildings of conventional frame, masonry, or metal construction, infiltration is normally adequate to provide air for combustion, ventilation, and dilution of flue gasses.

Appliances located in **confined** spaces:

- An confined space is one whose volume is less than 50 cubic feet per 1000 Btu per hour of the combined rating of all appliances installed in the space. That would be 5250 cubic feet for just the Infinion C13.
- The confined space must have two permanent openings, one commencing within 12 inches of the top and one commencing within 12 inches of the bottom of the enclosure. Each opening must have a minimum free area of one square inch per
  - √ 1000 Btu/hr capacity of the heater if all air is taken from inside the building (105 square inches for the Infinion C13).
  - √ 2000 Btu/hr if all air is taken from the outside by horizontal ducts (52.5 square inches for the Infinion C13).
  - √ 4000 Btu/hr if all air is taken from the outside by direct openings or vertical ducts (26.25 square inches for the Infinion C13).
- Louvers, grills and screens have a blocking effect. If the effective free area is not known, increase the sizes of your openings by 75% if your louvers are wood and by 30% if your louvers are metal. Refer to the National Fuel Gas Code for complete information. In buildings of tight construction all air should be taken from outside.

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# General Installation Guidelines

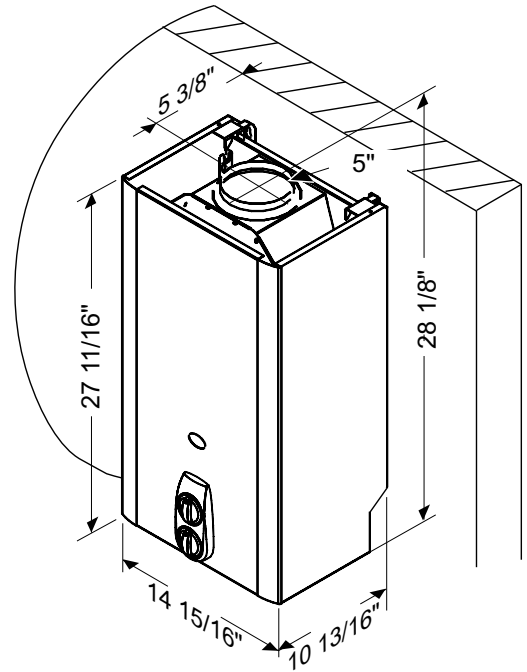
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## Allow Proper Clearances

The Infinion is designed for installation on a combustible wall and for installation in an alcove with the minimum clearances to combustible and non-combustible construction listed below

- Top - 12 inches ( 305 mm)
- Front - Open for access
- Back - 0 inches
- Sides - 4 inches (102mm)
- Bottom - 12 inches (306 mm)

Add the above clearances to the Infinion's dimensions shown here to figure your total space required for installation. Remember that these are minimum clearances for safety. Additional space always makes working on the heater easier.



Clearance from the vent is dependent upon the clearance rating of the venting material used. For example: type B-1 vent is approved for 1 inch clearance, B-2 vent for 2 inch, etc.

Note: Minimum clearance to combustible materials should not be less than 6" for single wall flue pipe. Note that this clearance can be reduced if combustible materials are protected as per table VI of the National fuel Gas Code or if Type B gas vent is used.

## Unpack the Infinion

The Infinion shipping box contains your heater and the accessory parts necessary to properly hook up to the water and gas supplies and to the vent system.

### Note -

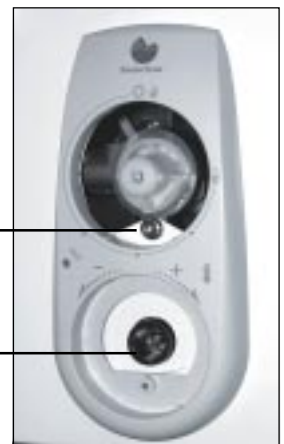
- Before removing the Infinion from the box, remove the top board of the wooden box reinforcement.
- Do not grasp the sides of the heater casing when lifting the Infinion out of the box. Lift the heater by the foam end pieces.

Along with the heater, the box contains the following hookup parts:

- 5" flue adapter
- Cold water inlet adapter with integral water stop cock
- Hot water outlet adapter
- Two 1/2" sweat copper adapters
- 1/2" steel ninety-degree gas fitting
- Fiber washers
- Two control knobs

### Note --

- To take the cover off the heater, remove the retaining screw located in the recess for the top control knob. See the photo at the right.
- Before installing the heater, remove and discard the small black plastic temporary support located in the hole for the bottom control knob. See the photo at the right.



## WARNING

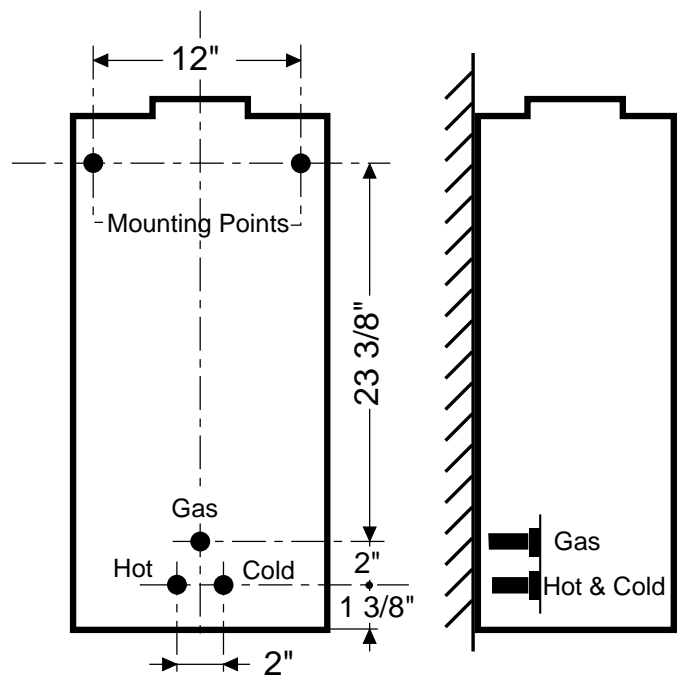
Before installing the unit, be certain you have the correct heater for your type of Gas - Propane or Natural Gas. Identification labels are found on the shipping box, and on the rating plate behind the front cover. In addition, each burner orifice is stamped with a number (77 for LPG and 120 for Natural Gas).

## Mount the Infinion to the Wall

The Infinion C13 mounts on a wall.

- Do not install this appliance on a carpeted wall or above floor covering which is combustible, such as carpet.
- Mount the heater on the wall using adequate anchors at the two mounting points (see drawing below).
- If the wall is a stud wall sheathed with plasterboard, first install support board(s), either 1x4's or 1/2" (minimum) plywood, across a pair of studs and then mount the heater to the support boards.

Expansion and contraction of the piping due to changing water temperature in the pipes imparts movement to the heater. If the heater were mounted directly to a brittle, friable board, such as plasterboard, this movement can cause the mounting attachments to fail.





**Do not reduce the vent pipe size**

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## *Vent the Infinion*

**You must vent this heater to the outside following all local ordinances and specifications for installing a gas appliance vent or chimney.**

- The venting system must be designed and constructed so as to develop a positive flow adequate to remove flue gasses to the outdoors.
- Minimum vent size must be 5". Use the flue adapter included with your heater to connect the draft diverter to 5" vent material.
- Minimum height must be 6 feet, provided there are no elbows.
- Termination of vent must be 2 feet above any obstruction within a 10-foot radius.
- Consult your gas utility, the National Fuel Gas Code, or Akwakai if the vent will have elbows or share venting with another appliance.
- The vent should have as much vertical rise as possible (minimum 12") before any horizontal run.
- The National Fuel Gas Code specifies double wall - Type "B" - vent pipe for use in cold climates and for gas vents running through attics. In general double wall vent pipe is preferable in all circumstances.
- Any vent section that runs at an angle greater than 45 degrees from vertical is considered horizontal. Horizontal sections of vent connectors must slope upwards at least 1/4 inch for every foot of its horizontal length. Keep the horizontal section short and avoid too many elbows.
- Note: The burners of an instantaneous water heater such as the Infinion are only on at the time that you are using hot water. Consequently, the vent may be cold except for short durations when hot water is used, so it is very important that the venting and air supply be adequate to provide a good positive draft as soon as the burners turn on.
- The Infinion C13 instantaneous water heater has a built-in draft diverter that is for indoor installation only. The draft diverter outlet must be connected to a clear, unobstructed vent of the same size, or larger. In Canada, see CAN/CGA-B149 Installation Code for detailed requirements. In the U.S.A., see ANSI Z223.1 - NFPA 54, national Fuel Gas Code for detailed requirements.



**Before connecting the gas supply, check the rating plate on the front of the draft diverter to be sure that the heater is rated for the same gas to which it will be connected.**

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## Connect the Gas

**Connect the gas supply to the Infinion gas valve using the 1/2" steel ninety degree fitting and washer as illustrated on page 16.**

- In the United States: the installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code ANSI Z223.1/NFPA 54. In Canada: The Installation should conform with CGA B149INSTALLATION CODES and /or local installation codes.
- NOTE: The Infinion C13 comes with a gas pressure regulator that must be installed on the heater before attaching the gas supply line. See figure 4. The regulator supplied with the heater is preset for the gas shown on the rating plate to the correct pressure. It is an appliance level regulator designed for (low inlet) pressure (less than 1/2 Psig or 15" W.C.) DO NOT connect to an unregulated or high-pressure propane line or to a high-pressure commercial natural gas line.
- The pressure regulator provided with the heater is adjusted to deliver the proper gas pressure (as indicated on the rating plate and in the manual for altitude up to 2000 feet.

### **GAS LINE SIZE**

- For natural gas the pipe should be minimum 3/4" for any pipe run over ten feet. If the maximum length is above 40 feet, use 1" line.
- Flexible tubing is NOT recommended, but if it is to be used, oversize it.
- For an LP gas installation, the recommended sizes are 5/8" up to a maximum of 20 feet distance, 3/4" up to 50 ft distance and 7/8" up to 100 feet.
- The National Fuel Gas Code requires the installation of a sediment trap (drip leg) on gas appliances not so equipped. The drip leg must be accessible and not subject to freezing conditions. Install a drip leg in accordance with the recommendations of the gas supplier.



## WARNING

Disconnect the heater from the gas supply piping system during any pressure testing of that system at test pressures in excess of 0.5 psig. Isolate the water heater from the gas supply piping system by closing the manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 0.5 psig. Do not operate the water heater, including the pressure regulator provided with it, at gas supply pressures in excess of 0.5 psig. If an overpressure condition has occurred, such as through improper testing of the gas lines or emergency malfunction of the supply system, check the gas valve and regulator for safe operation. Make sure that the regulator vent is protected against blockage. When your connections are made, check for gas leaks at all joints (not just the ones you made). Apply some soapy water to all gas fittings and gas valve. Soap bubbles are a sign of a leak.

**NOTE:** Do not apply soap solution to the pilot orifice area. If you have a leak, shut off the gas. After verifying that required gaskets are in place, tighten appropriate fittings to stop leak. Turn the gas on and check again with a soapy solution. Never test for gas leaks using a match or flame.

## Connect the Gas continued

### High Altitude Installations

On appliances being installed above 2000 ft (660 meters) elevation, set the inlet gas pressure to the value shown below.

NOTE:

- The gas pressures specified below refer to pressures taken at the test pressure nipple at the rear of the gas valve.
- Take these readings while the heater is operating at full input - i.e. maximum water flow with the temperature dial selector turned all the way clockwise.

### Maximum Inlet Gas Pressures

Altitude	Natural Gas	Liquid Propane
0 ft to 2,000 ft	8 inches W.C.	14 inches W.C.
2,000 ft to 4,500 ft	6.4 inches W.C.	11.2 inches W.C.

## *Connect the Water*

**Connect the hot and cold water lines to the Infinion using the accessory fittings as illustrated in the drawing on the next page.**

- Regardless of the type of water piping in your structure, use copper piping (for at least three feet before and after) to connect to the heater.
- Use no less than 1/2 inch diameter pipe to assure full flow capacity.
- If the hot and cold connections to the heater are reversed, the heater will not function.
- The Infinion C13 has two 1/2" copper sweat fittings for the inlet and outlet water connections. These fittings seal to the water valve by means of a union connection with a washer type gasket at the joint. Do not use pipe dope or thread tape at these joints.
- Make sure there are no loose particles or dirt in the piping. Blow out or flush the lines before connecting to the Infinion.
- For installation on a private well system, be sure that the water pressure is set between 30 and 50 psi.
- Install a listed pressure relief valve (PRV) in the hot outlet from the heater. Do not place any valve the PRV and the heater. Do not install any reducing coupling or other restriction discharge line. Install the discharge line so that it allows complete drainage of both the PRV and the line. Install the PRV so that it is readily accessible for servicing or replacement., and is as close to the water heater as possible. To accomplish this, a suitable fitting connected to an extension on a "T" fitting can be sweated to the hot water line.

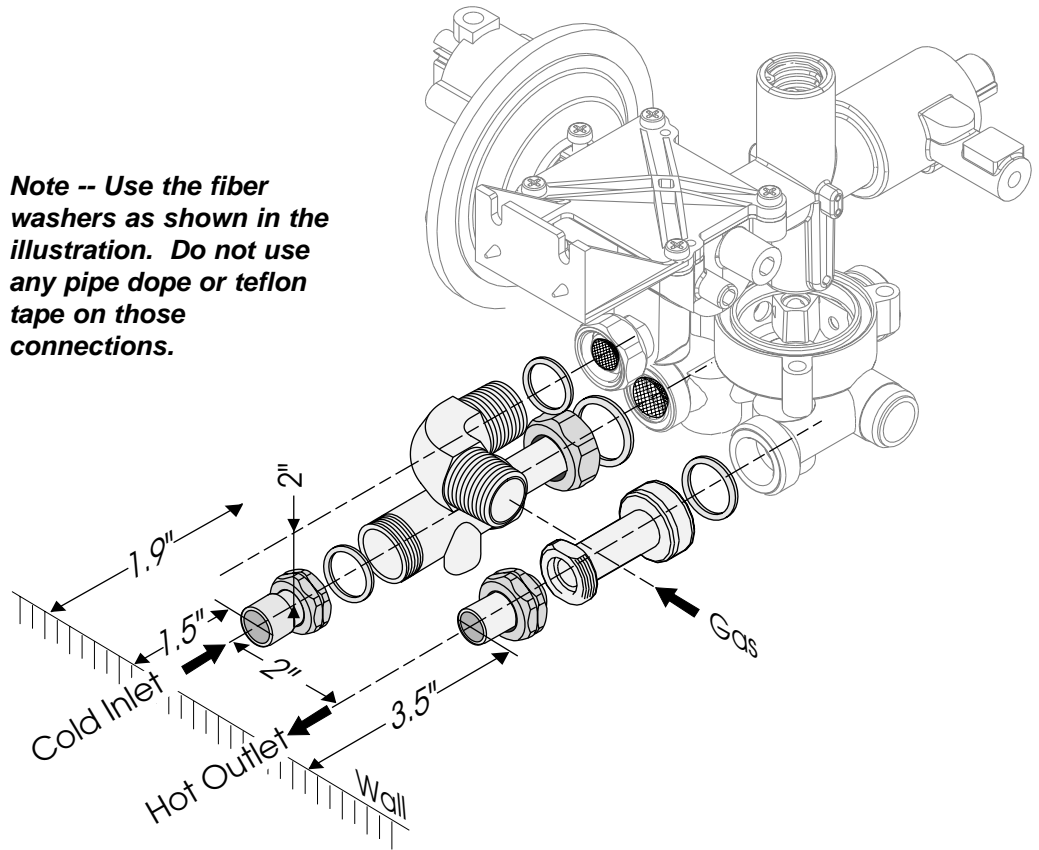
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# Installing Your Infinion

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## Gas and Water Connections

**Note -- Use the fiber washers as shown in the illustration. Do not use any pipe dope or teflon tape on those connections.**



## *Start the Infinion*

**Before starting the heater, fill the system with water.**

- Open the cold water inlet supply to the heater fully.
- Open a hot water faucet to let water fill the heater and the piping and to eliminate the air trapped in the system.
- Close the hot water faucet after the water flows freely and all the air has escaped from the system.
- The water heater is now ready to start.

**To start the Infinion, follow the instructions on the front cover of the heater. The instructions are also shown below.**



## DANGER

**WATER TEMPERATURE ADJUSTMENT - Consider safety and energy conservation when selecting the heater's output water temperature. Water temperatures above 125°F. can cause severe burns or death from scalding. Read and follow the warnings outlined in this manual.**

**NOTE: Households with small children, disabled, or elderly persons may require a 120°F. or lower output temperature to prevent contact with "HOT" water. Test the water temperature by turning on a hot water faucet, placing a thermometer in the hot water stream, and reading the thermometer.**

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## *Set the Water Temperature*

The Infinion has a gas control that adjusts burner input in response to flow. Its purpose is to ensure that the hot water temperature will remain steady, although the water flow demand might vary.

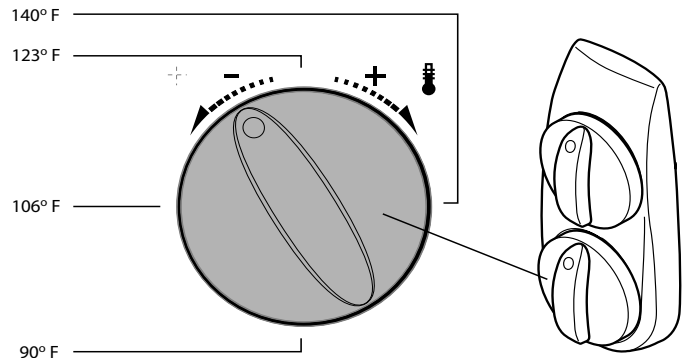
To adjust the temperature on your Infinion, turn on a hot water faucet to its maximum flow. At the water heater, turn the upper control knob fully counterclockwise and the lower control knob fully clockwise. This will produce a temperature rise of approximately 90° F at flow rates between 0.5 and 2.0 gallons per minute. Given that average incoming water temperatures are 50° F, this heater will produce approximately 140° F water at these flow rates. Turning the lower knob all the way counterclockwise will produce a temperature rise of approximately 45° F. It is safest to select a comfortable temperature and not have to mix in cold water. What is the best temperature setting? Because Infinion water heaters deliver endless hot water at the temperature you have selected, there is no need to produce very hot water and then mix in cold. It just does not make sense to overheat water and then mix in cold to cool it off. You cannot run out of hot water with an Infinion, so set the dial for the temperature you prefer .

Note: 105° F is the maximum recommended for a hot bath.

## Set the Water Temperature continued

The position you select on the temperature adjustment knob will depend on the temperature of the incoming water (50° F is average in the U.S.). In warm weather regions where the incoming cold water is generally warmer, or during the hot weather months in some other areas a midway setting on the temperature adjustment knob would produce a temperature rise of about 70° F, giving an output of approximately 120° F. At this setting, if it is still necessary, one could mix a small amount of cold water in a shower and have a comfortable shower at about 3 gallons/minute. During the colder months, or in cold climate areas, it might be necessary to set the control to the maximum position, all the way clockwise.

**Approximate outlet  
water temperature  
settings**



## Adjust the Gas Input Capacity

If after adjusting the outlet water temperature, the water is still too hot, you can further lower the temperature by reducing the input gas capacity of the Infinion. Turn the upper control knob clockwise to any one of the four detent positions. Turning the knob clockwise lowers the heater's capacity.

