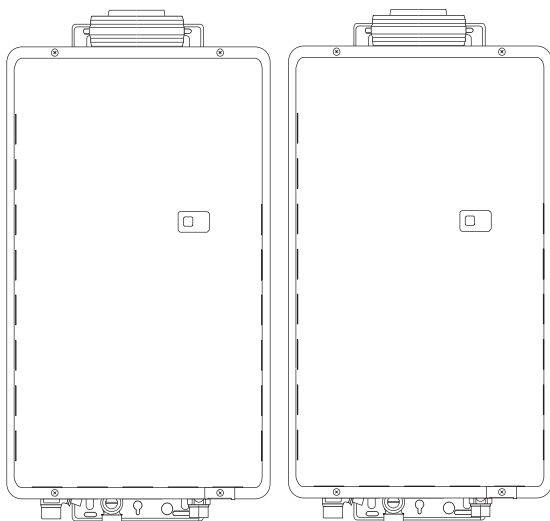


Rinnai

Operation / Installation Manual



To Suit Models:

REU-V2520FFU.....	R53
REU-V2520FFUC...	C53
REU-V2532FFU.....	R85
REU-V2532FFUC....	C85



(Residential and Commercial indoor unit)

ANS Z21.10.3 • CSA 4.3

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

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
 - Do not try to light any appliance.
 - Do not touch any electrical switch; do not 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.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

S P E C I F I C A T I O N S

Model		V2532FFU	V2532FFUC	V2520FFU	V2520FFUC
Minimum Gas Consumption Btu/h		15,000			
Maximum Gas Consumption Btu/h		180,000			
Hot water capacity, (50°F rise)		0.6 to 6.5 GPM		0.6 to 5.3 GPM	
Hot water capacity, (35°F rise)		0.6 to 8.5 GPM		0.6 to 5.3 GPM	
Factory Temperature Setting		104°F	140°F	104°F	140°F
Maximum Temperature Setting		140°F	185°F	140°F	185°F
Minimum Temperature Setting		98°F			120°F
Weight		49 Lbs.			
Efficiency Rating		87%			
Noise level		49 dB (A)			
Electrical Consumption	Normal	75 watts			
	Standby	5.5 watts			
	Anti-frost Protection	100 watts			
By-Pass Control		Electronic		Fixed	None
Minimum Gas Supply Pressure	Natural Gas	6" W.C.			
	Propane	10" W.C.			
Maximum Gas Supply Pressure	Natural Gas	10.5" W.C.			
	Propane	13.5" W.C.			
Type of Appliance		Temperature controlled continuous flow gas hot water system.			
Operation		With or without remote controls, mounted in kitchen, bathroom, ect.			
Exhaust System		Direct Vent - Forced Combustion			
Approved Gas Type		Natural Gas or Propane - Ensure unit matches gas type it's being installed on.			
Connections		Gas Supply: 3/4" MNPT, Cold Water Inlet: 3/4" MNPT, Hot Water Outlet: 3/4" MNPT			
Ignition System		Direct Electronic Ignition			
Electric Connections		Appliance: AC 120 Volts, 60Hz. Remote Control: DC 12 Volts (Digital)			
Water Temperature Control		Simulation Feedforward and Feedback.			
Water Supply Pressure		Minimum Water Pressure: 20 PSI (Recommended 30-80 PSI for maximum performance)			
Maximum Water Supply Pressure		150 PSI			
Remote Control Cable		Non-Polarized Two Core Cable			
Safety Devices		Flame Failure - Flame Rod			
		Boiling Protection - 210°F			
		Remaining Flame (OHS) 207°F Bi-Metal Switch			
		Thermal Fuse 264°F			
		Automatic Frost Protection - Bi-Metal Sensor & Anti-Frost Heaters			
		Combustion Fan RPM Check - Integrated Circuit			
		Over Current - Glass Fuse (3 amp)			
		If remote fails or becomes disconnected unit defaults to 100°F with water flowing, this is an anti-scald feature.			



Rinnai is continually updating and improving products, therefore, specifications are subject to change without prior notice. Local, state, provincial and federal codes must be adhered to prior to installation.

LIMITED WARRANTY

Rinnai Water Heater

Warranty031705COMM-V2

WHAT IS COVERED?

This Warranty covers any defects in materials or workmanship when the product is installed and operated according to Rinnai written installation instructions, subject to the terms within this limited warranty document. This Warranty applies only to products that are installed by a state qualified or licensed contractor. Improper installation may void this Warranty. Rinnai strongly suggests that you use an installer who has attended a Rinnai product knowledge class before installing this water heater. This Warranty extends to the original purchaser and subsequent owners, but only while the product remains at the site of the original installation. This Warranty only extends through the first installation of the product and terminates if the product is moved or reinstalled at a new location.

HOW LONG DOES COVERAGE LAST?

Item	Period of Coverage	
	Commercial	Residential
Heat Exchanger	5 Years	10 Years*
All other Parts and Components	5 Years	5 Years*
Reasonable Labor	1 Year	

*Important

Period of coverage is 3 years from date of purchase when used as a circulating water heater within a hot water circulation loop, when the water heater is in series with a circulation system and all circulating water flows through the water heater.

WHAT WILL RINNAI DO?

Rinnai will repair or replace the product or any part or component that is defective in materials or workmanship, except as set forth below: Rinnai will pay reasonable labor and shipping costs to repair the product. All repairs must be performed using genuine Rinnai parts. All repairs or replacements must be performed by an individual or servicing company that is properly trained, state qualified or licensed to do this type of repair.

Replacement of the product or replacement of the heat exchanger may be authorized by Rinnai only. Rinnai does not authorize any person or company to assume for it any obligation or liability in connection with the replacement of a product or heat exchanger. If Rinnai determines that repair of a product is not possible, Rinnai will replace the product with a comparable product, at Rinnai's discretion. If a component or product returned to Rinnai is found to be free of defects in material or workmanship, or damaged by improper installation or damaged during return shipping, the warranty claim for product, parts and labor may be denied.

LIMITED WARRANTY

Rinnai Water Heater

Warranty031705COMM-V2

HOW DO I GET SERVICE?

Simply contact a qualified Service Dealer or Installer for the repair of products under this Warranty. **Failure to use a qualified Service Dealer or Installer to provide repair service may void the Warranty.** For the name of the qualified Service Dealer or Installer nearest you, please contact the company that installed the water heater, or;

- Your local HVAC/plumbing dealer, gas service technician or place of purchase
- Visit the Rinnai website www.rinnai.us
- Call Rinnai at 1-800-621-9419 or write to Rinnai, 103 International Drive, Peachtree City, Georgia 30269

Proof of purchase is required to obtain warranty service. You can show proof of purchase with a dated sales receipt, by completing and mailing the enclosed Warranty registration card within 30 days of purchasing the product or by registering online at www.rinnai.us. **Please complete the Warranty registration either online or mail it to Rinnai at the address shown on the card.**

Receipt of warranty registration by Rinnai will constitute proof-of-purchase for this product. However, Warranty registration is not necessary in order to validate this Warranty.

WHAT IS NOT COVERED?

This Warranty does not cover any failures or operating difficulties due to accident, abuse, misuse, alteration, misapplication, acts of God, improper installation, improper maintenance or service, inadequate water quality, scale buildup, freeze damage or for any other causes other than defects in materials or workmanship. This warranty does not apply to any product whose serial number or manufacture date has been defaced. This Warranty does not cover any product when used as a pool or spa heater.

This Warranty does not apply if the water supply to the water heater does not meet the National Secondary Drinking Water Regulations, as set forth in the U.S. Code of Federal Regulations, 40 CFR, Chapter 1, Part 143 or the water supply exceeds chemistry or impurity limits as shown in the chart below:

Description	pH	TDS (Total Dissolved Solids)	Total Hardness	Aluminum	Chlorides	Copper	Iron	Manganese	Zinc
Maximum Levels	6.5 to 8.5	Up to 500 mg/L	Up to 11.7 gpg	Up to 0.2 mg/L	Up to 250 mg/L	Up to 1.0 mg/L	Up to 0.3 mg/L	Up to 0.05 mg/L	Up to 5 mg/L

Rinnai is not liable for any special, incidental, indirect or consequential damages that may arise, including damage to person or property, loss of use, failure to install drain pan under unit, or inconvenience. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

LIMITATION ON IMPLIED WARRANTIES

Any implied warranties of merchantability and fitness arising under state law are limited in duration to the period of coverage provided by this limited Warranty, unless the period provided by state law is less. Some states do not allow limitations on how long an implied Warranty lasts, so the above limitation may not apply to you.

This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

C O N T E N T S

Specifications.....	2
Limited Warranty.....	3,4
Owner's Installation Information	6
Features of Your New Water Heater.....	7
Safety Issues.....	8
Basic Operation	9
About Hot Water.....	10
Scalds-First Aid.....	10
General Controller Information	11
Remote Controller Operation.....	12
Deluxe Controller.....	13,14,15,16,17
Controllers Set Pattern/Temperature Tables.....	18
Error Messages	19
Maintenance & Service Information	20,21
Trouble Shooting and Common Questions	22
For Your Safety Read Before Operating	23
Operating Instructions.....	23,24
Care & Lime Condition Warning	24
Installer's Instructions	25-47

OWNER'S INSTALLATION INFORMATION

All Rinnai water heater(s) MUST be installed by a state qualified or licensed contractor. Failure to comply with state and local codes pertaining to water heater installations may void the warranty on your new water heater(s). It is the responsibility of the person having the water heater installed to ensure the installing contractor has proper licences and permits for installing water heater(s) in your location. In addition to licensing and permits, Rinnai encourages all installing contractors to attend a product knowledge class before installing any of our water heaters to help insure maximum customer satisfaction and maximum warranty coverage. Failure to comply with state and local codes may result in non-compliance and may void the warranty of the water heater(s).












This appliance must be installed in accordance with local codes, or in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and/or the CSA B149.1, Natural Gas and Propane Installation Code.

Install this product indoors ONLY, DO NOT install outdoors.

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 and any gas control which has been underwater.

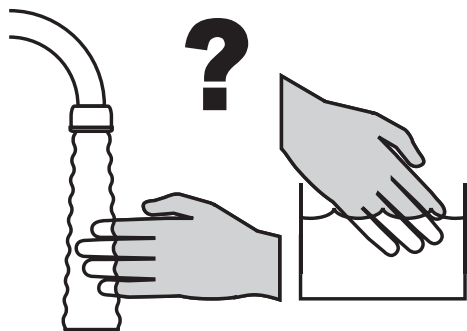
Detailed instructions on the proper installation practices to follow for the installation of your new hot water heater(s) are included at the back of this manual.

FEATURES OF YOUR NEW WATER HEATER

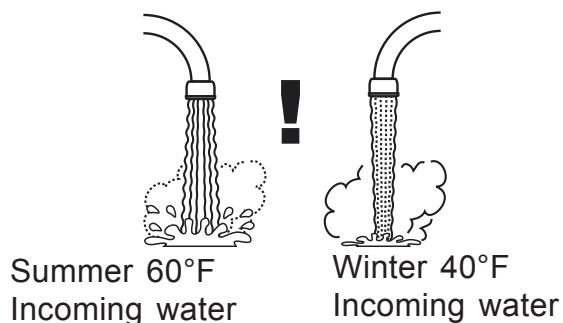
-  The Rinnai Water Heater is one of the most advanced water heaters available. It supplies hot water continuously at the temperature preset in the unit or at the temperature set on the optional remote controller(s). Installation of remote controller(s) are recommended for optimum performance.
-  The Rinnai Water Heater never runs out of hot water. While electricity, water and gas supplies are connected, the Rinnai Water Heater produces hot water whenever the hot tap is open.
-  The gas burner lights automatically when the hot water tap is opened, and goes out when the tap is closed. Ignition is electronic, there is no pilot light. When the hot water tap is off, no gas is used. You save energy and money with the Rinnai Water Heater.
-  The temperature of the outgoing hot water is constantly monitored by a built in sensor. If the temperature of the outgoing water rises to more than 6 degrees above the selected temperature (shown on the digital remote control) the gas burner will automatically go out. The gas burner will re-ignite once the outgoing hot water temperature falls below the selected temperature.
-  Built into the microprocessor of the Rinnai Water Heater is the ability to LIMIT THE MAXIMUM TEMPERATURE of the hot water supplied by the Rinnai Water Heaters. Without the connection of a remote controller(s), the Rinnai Water Heater is preset to deliver water at 104°F (Residential) and 140°F (Commercial).
-  Residential Unit: With the remote controller(s) the water temperature is adjustable from 98 to 140°F. **The water temperature cannot be set to a temperature other than 120°F without the use of a remote controller unit.**
-  Commercial Unit: With the remote controller the water temperature is adjustable up to 185°F. **The water temperature cannot be set to a temperature other than 140°F without the use of a remote controller unit.**
-  Error messages are displayed on the optional remote controller(s), simplifying service calls.
-  The Rinnai Water Heater incorporates a device to minimize temperature fluctuations (cold water sandwich effect) when the water is off, then on again. This effect can be eliminated by installing the Rinnai Water Heaters with a circulation loop with a small storage tank.
-  The sound (noise) level from the Rinnai Water Heaters is very low.
-  The Rinnai Water Heater is a very compact direct vented device. It saves valuable floor and wall space.

SAFETY ISSUES

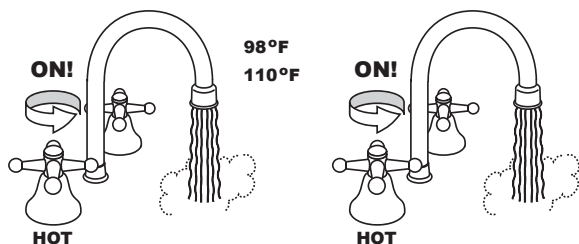
Always check water temperature by hand before entering the shower or bath. The temperature may have been changed.



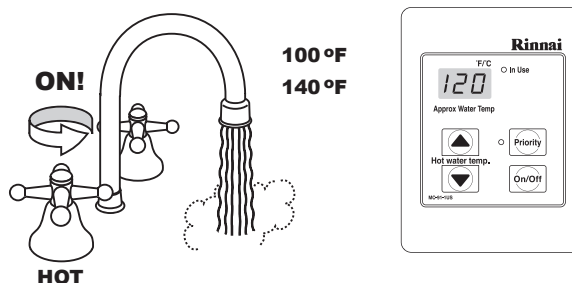
The Rinnai Water Heater controls the water temperature automatically. To do this, it sometimes needs to change the water flow accordingly. The water flow from the hot water tap may vary after the selected temperature at the remote controller(s) is altered. The water flow may also vary from summer to winter, as incoming water temperatures differ.



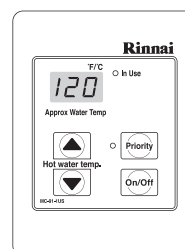
The water temperature can only be adjusted between 98°F and 110°F when the hot water tap is open, and hot water is flowing.



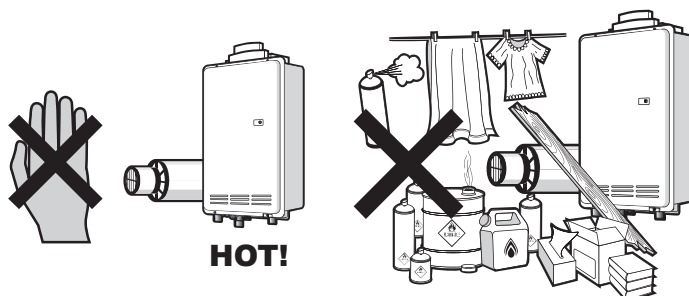
Depending on the weather conditions and the length of the pipe between the Rinnai Water Heater and the tap in use, there may be a variation between the temperatures displayed at the remote controller(s) and the temperature of the water at the tap.



Do not clean remote controller(s) with solvents. Use a soft damp cloth.



The vent/air intake should be positioned away from flammable materials, trees, shrubs, etc.



Do not connect vent to natural draft vents or fireplaces, this unit can only be used with an approved Rinnai/Ubbink vent kit and components. Do not vent unit into other rooms. Vent terminal must be outside.

BASIC OPERATION

1 Adjusting Temperature

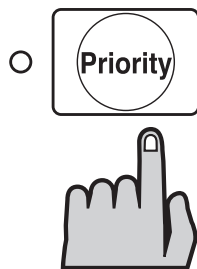
The outlet water temperature of the Rinnai Water Heater can only be adjusted by the user using the remote controller(s). To adjust the setpoint temperature of the Rinnai Water Heater, all hot water taps must be closed, and all circulating pumps turned off (where applicable). The temperature displayed on this remote controller will also be displayed on all other remote controller(s).



NOTE

TEMPERATURE CANNOT BE ADJUSTED EXCEPT BETWEEN 98 °F AND 110°F WHEN ANY HOT WATER TAP IS OPEN.

- 2** To take control of the Rinnai Water Heater all hot water taps must be closed. Press the "Priority" button on the Controller you want to set the temperature with, and the green "Priority" indicator light will



glow. This indicates that the Rinnai Water Heater is ready to supply hot water at the set temperature as soon as a tap is opened.

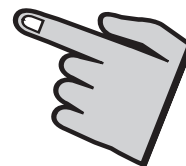
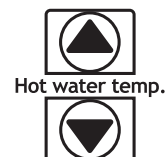
Note: Rinnai Water Heater will not provide hot water instantly at the hot water fixtures. Any cold water existing in the hot water lines must be purged first.



NOTE

CHECK WATER TEMPERATURE BEFORE ENTERING SHOWER OR BATH.

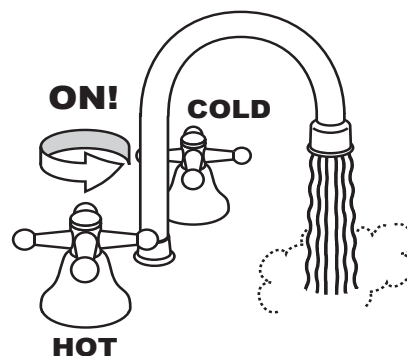
- 3** Simply press the ▲ or ▼ button until the required temperature is displayed on the Digital Monitor. There is a hot water scald potential if the thermostat is set to high.



NOTE

CHECK LOCAL CODES FOR THE MAXIMUM WATER TEMPERATURE SETTING ALLOWED WHEN USED IN NURSING HOMES, SCHOOL, DAY CARE CENTERS, AND ALL OTHER PUBLIC APPLICATIONS.

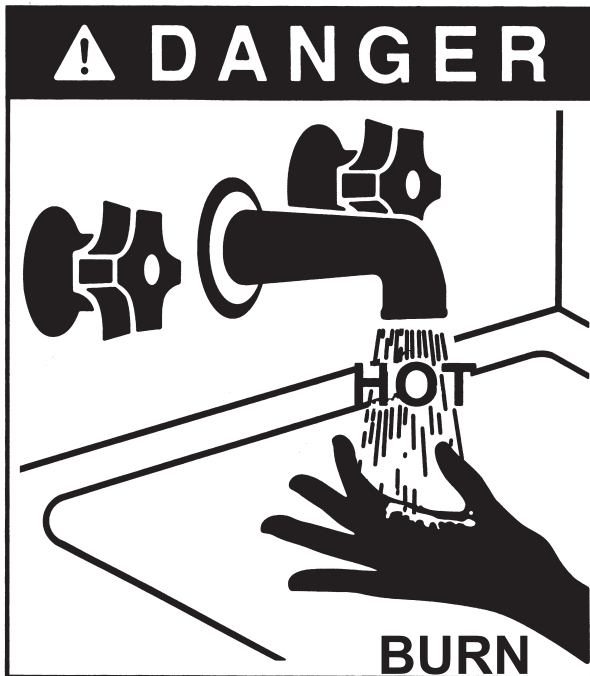
4



To operate the Rinnai Water Heater simply turn any hot water tap on. This will automatically light the burner providing hot water at the preset temperature. If the optional remote controller(s) have been installed, the red "IN USE" indicator will glow on all remote controller(s).

ABOUT HOT WATER

Hot Water Is Dangerous, especially for the young and the elderly or the infirm. The Rinnai Water Heater allows you to precisely control the temperature of your hot water, ensuring safe hot water temperatures.



Water Temperatures over 125°F can cause severe burns instantly or death from scalds.

Hot Water can cause first degree burns with exposure for as little as:

3 seconds at 140 °F
20 seconds at 130 °F
8 minutes at 120 °F

Test the temperature of the water with your elbow before placing a child in the bath or shower.

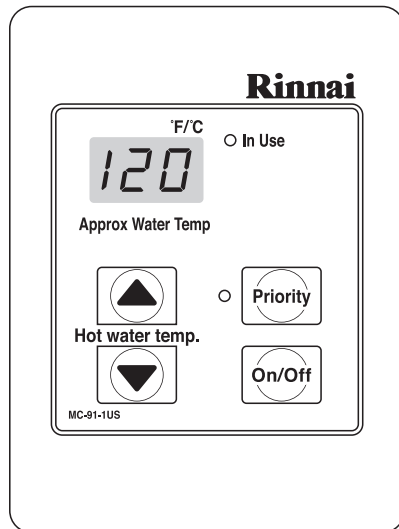
Do not leave a child or an infirm person in the bath unsupervised.

Scalds - First Aid

- 1) **Remove clothing;** Remove all wet clothing, quickly. Wet clothing retains the heat.
- 2) **Apply cold water for 30 minutes;** Immediately submerge the burnt area in cold water for 30 minutes to reduce the heat in the skin, preventing deeper burning. Never use butter, oils or ointment to cover the burn. They may retain the heat.
- 3) **Keep the scalded person warm;** Place a blanket around the person.
- 4) **Seek Medical Advice;** Call your medical advice hotline and describe the scald, follow their directions.

GENERAL CONTROLLER INFORMATION

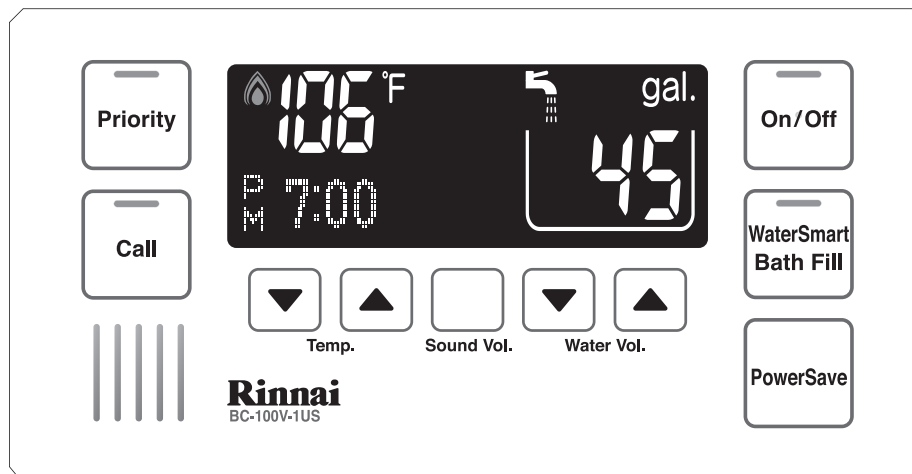
REMOTE CONTROLLERS IDENTIFICATION



MC-91-1US (comes with the unit)



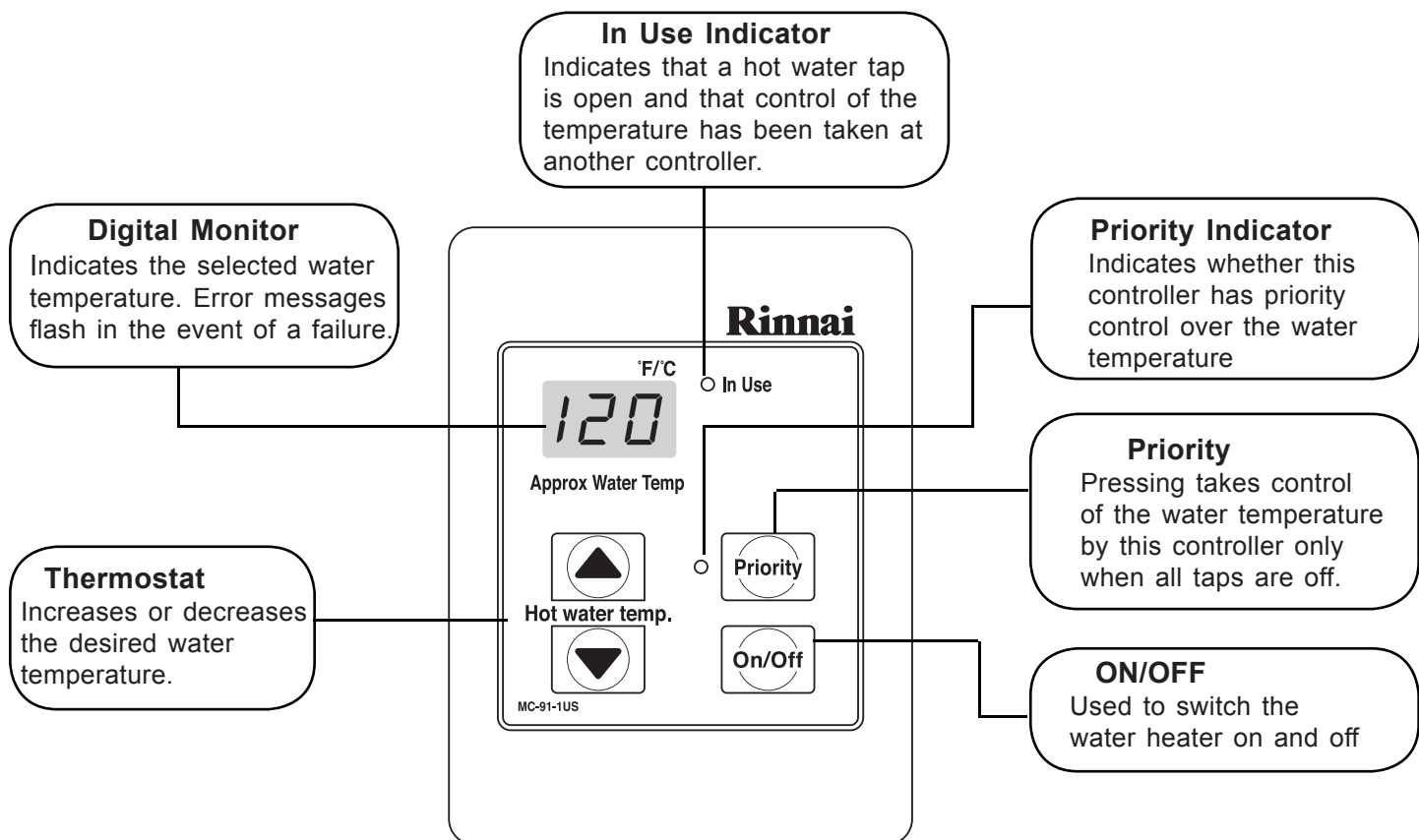
MC-100V-1US (optional)



BC-100V-1US (optional)

The controller(s) for the Rinnai Water Heater allow the customer to control the functions of the water heater and to diagnose certain fault conditions

REMOTE CONTROLLER OPERATION



DIAGNOSTIC USE OF CONTROLLER

1. **To Display Maintenance Codes:** Press 'On/Off' button. To sequence through stored maintenance codes, press 'On/Off' followed by the ▲ thermostat button.
2. **To Display Water Flow through water heater:** Press ▲ thermostat button, hold for 2 seconds and simultaneously press 'On/Off' button.
3. **To display Outlet Water Temperature:** Press ▼ 'thermostat button', hold for 2 seconds and simultaneously press 'On/Off' button.

TO CHANGE TEMPERATURES FROM °F to °C

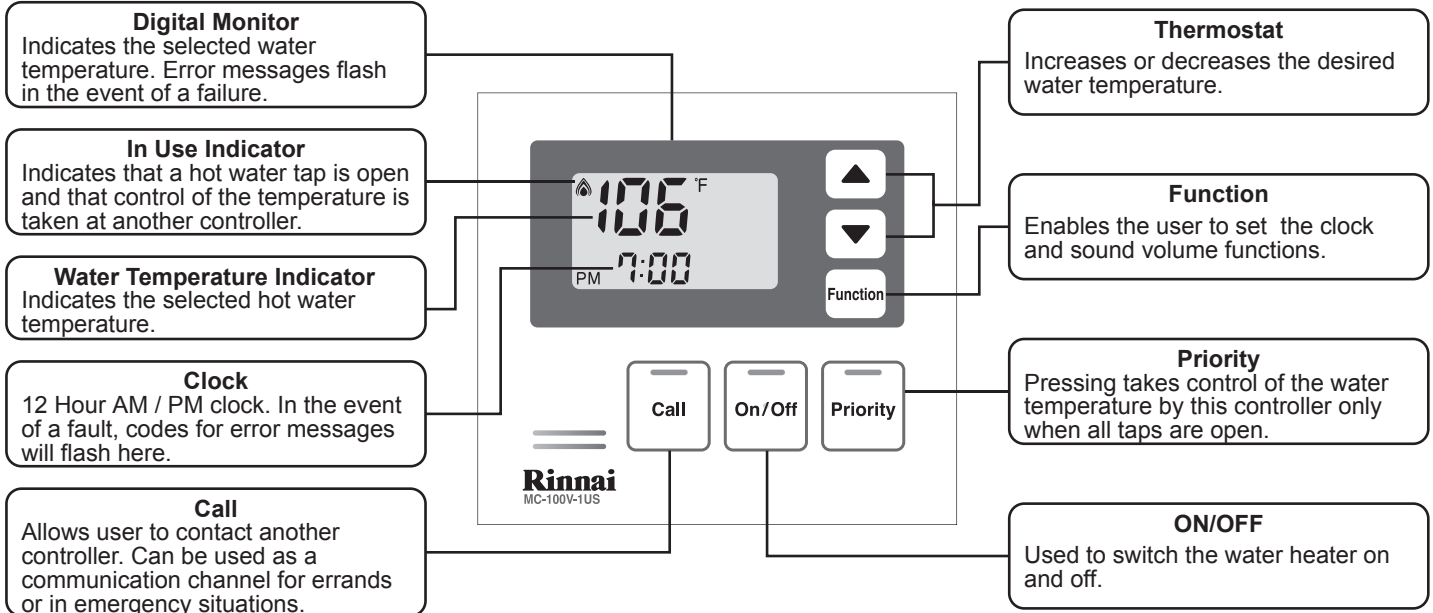
1. Press and hold 'On/Off' button for 5 seconds while water heater is OFF.
2. To change back from °C to °F, please repeat step 1.

MUTE

To eliminate the beeping sound, press and hold ▲ and ▼ button simultaneously until a 'beep' is heard (approximately 5 seconds).

DELUXE CONTROLLER

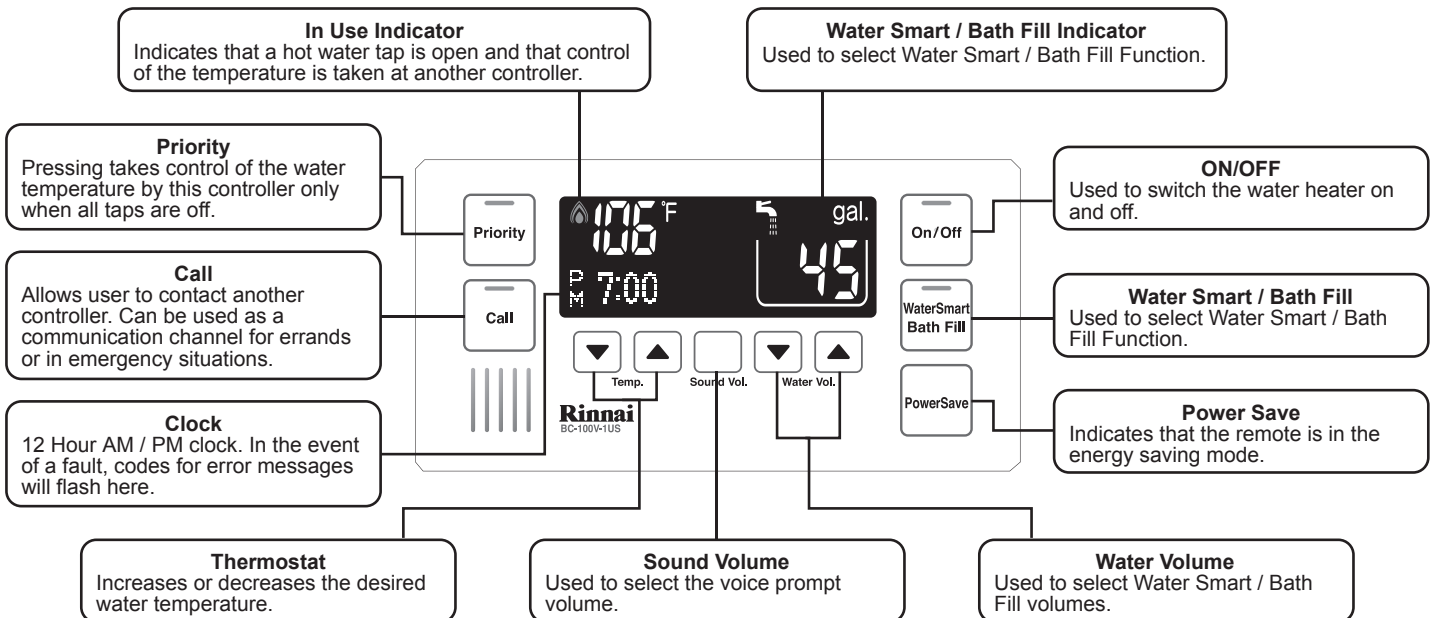
ABOUT THE DELUXE CONTROLLER (MC-100V-1US)



With power interruption, water heater will automatically default to the ON position to provide hot water.

DELUXE BATHROOM CONTROLLER

ABOUT THE THE DELUXE BATHROOM CONTROLLER (BC-100V-1US)



DELUXE CONTROLLER

Setting The Sound Volume

To do this, press the 'Function' Button, the default voice prompt sound volume is medium, each subsequent press of the ▲ and ▼ Button will cycle through the available volume settings in the following order: High Voice - Off Voice (beep) - Off Sound (no beep) - Low Voice - Medium Voice.

Setting The Clock (MC-100V Deluxe Controller ONLY)

The clock is a 12 hour AM/PM style display. To set the time, press the 'Function' Button twice within 10 seconds. Press the ▲ and ▼ Buttons to adjust the time. When you get close to the time you wish to set, press the button intermittently to avoid going further than the desired time.

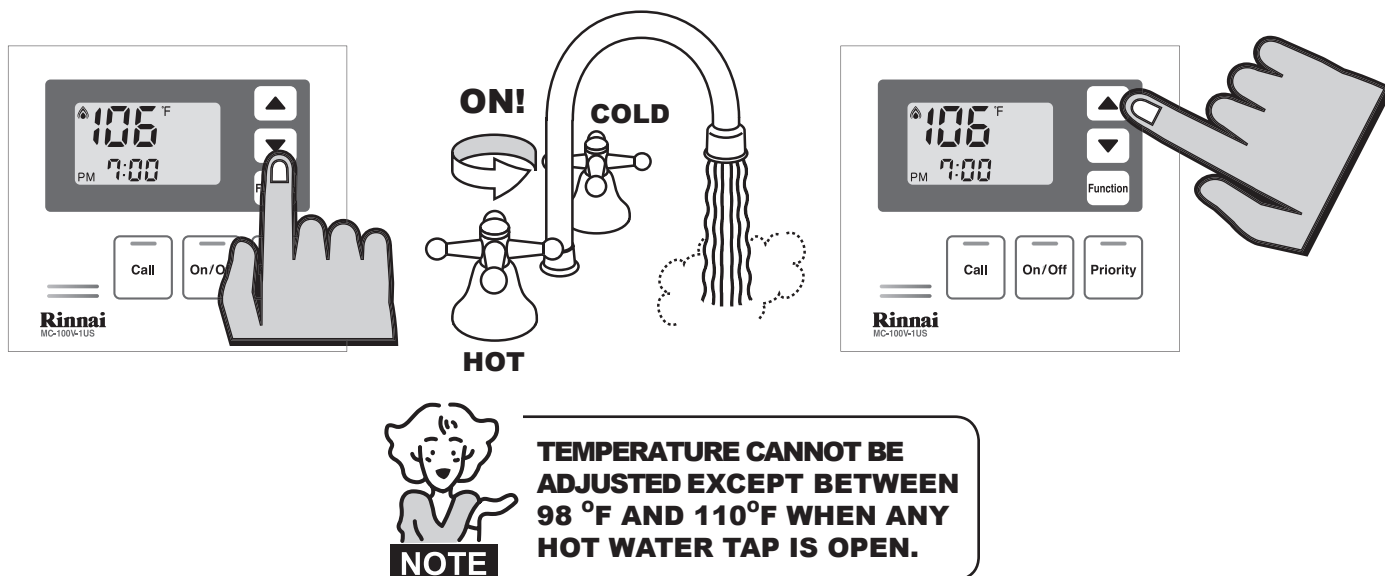
Press the 'Function' Button again to complete setting the clock and return to normal operation.

Adjusting Temperature

Simply press the ▲ or ▼ buttons until the required temperature is displayed on the Digital Monitor.

To Operate the hot water unit, open any hot water tap. This will automatically light the burner providing hot water. The red flame of the water heater 'In Use Indicator' 🔥 will illuminate on the Controller.

Once the hot water is running, if the set temperature is either too hot or cold, press the ▲ or ▼ buttons until the desired temperature is reached.

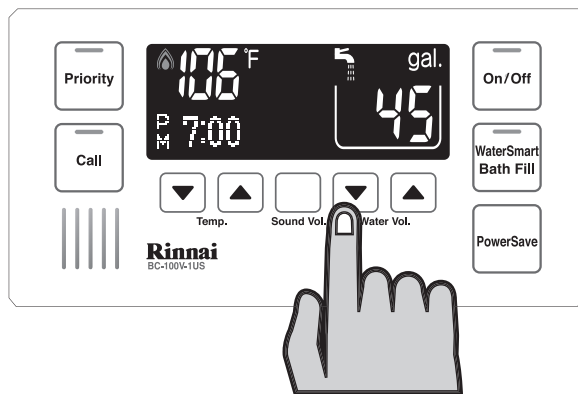


DELUXE BATHROOM CONTROLLER

Setting the Sound Volume

The voice prompt sound volume for all Deluxe Controller(s) can be set individually. To do this, press the 'Sound Vol.' button. The default voice prompt sound volume is medium, each subsequent press of the 'Sound Vol.' will cycle through the available volume settings in the following order: High Voice - Off Voice (beep) - Off Sound (no beep) - Low Voice - Medium Voice.

Press the 'Sound Vol.' again to complete setting of the sound volume and return to normal operation.

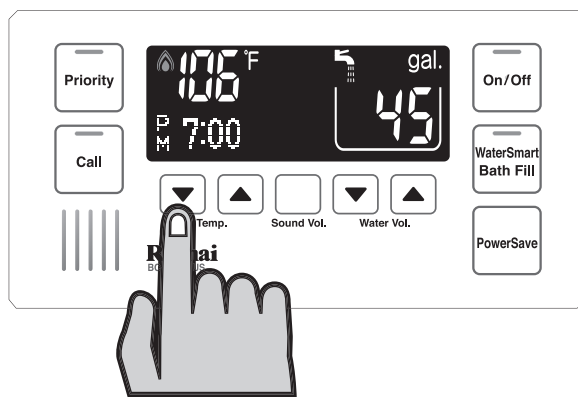


Adjusting Temperature

Simply press the 'Hot water temp.' ▲ or ▼ buttons until the required temperature is displayed on the Digital Monitor.

To Operate the hot water unit, open any hot water tap. This will automatically light the burner providing hot water. The red flame of the water heater 'In Use Indicator' 🔥 will illuminate on the Temperature Controller.

Once the hot water is running, if the set temperature is either too hot or cold, press the 'hot water temp. ▲ or ▼ buttons until the desired temperature is reached.



TEMPERATURE CANNOT BE ADJUSTED EXCEPT BETWEEN 98°F AND 110°F WHEN ANY HOT WATER TAP IS OPEN.

NOTE



CHECK WATER TEMPERATURE BEFORE USE.

A parent should always check the temperature before a child is placed in contact with hot water.



Each time a button is pressed, a 'beep' will sound. The 'beep' sound and the 'bath fill complete' buzzer can be muted by pressing the Temperature Controller Up and Down buttons simultaneously for more than 3 seconds. To return to original settings, repeat this step.

Avoid getting water in the speaker as this may cause damage.

DELUXE BATHROOM CONTROLLER



IT IS THE CUSTOMERS RESPONSIBILITY TO MONITOR THE BATH FILL REMOTE CONTROLLER FUNCTIONS.

OPERATING THE WATER SMART / BATH FILL BUTTON

The 'Water Smart / Bath Fill' button allows a preset water volume and temperature to be selected and run automatically.

Initial Settings

When you press the 'Water Smart / Bath Fill' button, a Shower / Bath Volume will appear on the indicator. When a deluxe bathroom controller(s) is first turned on, the default shower / bath fill volume is set to 25 gallons. The shower / bath volume can be lowered to a minimum of 10 gallons or raised to a maximum of 120 gallons.



Programming shower / Bath Volume and Temperature

With the system on, select a Deluxe Bathroom controller(s) and ensure that it currently has priority. If it does not have priority, press the 'Priority' button once and the 'Priority' button will

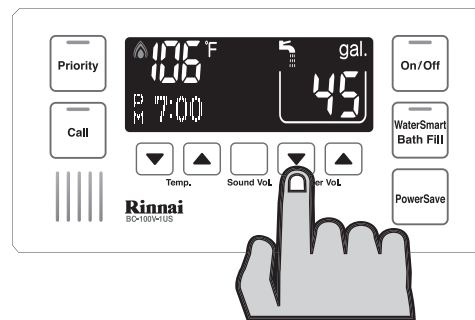
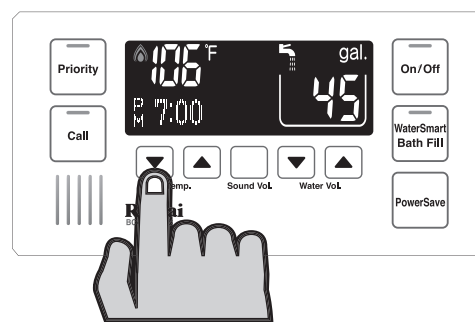
To select the desired delivery temperature, use the 'Temp.' ▲ or ▼ buttons.

The selected temperature will be displayed on the bathroom controller monitor and will remain as the default temperature until it is changed.

To select the volume of water to be used by the shower / bath, use the 'Water Vol.' ▲ or ▼ buttons.

The selected volume is displayed at the Right of the controller monitor numerically.

When filling a bath for the first time, it is recommended that a low bath fill volume such as 25 gallons or lower (if available) be used. During any subsequent bath fills, the volume can then be adjusted to suit your known bath volume and / or desired fill level.



Be careful not to overfill the bath, an average bath volume is 60 gallons. It is recommended that when filling a bath for the first time you should:

- Remain by the bath during the filling process.
- Use a low bath fill volume such as 25 gallons or less.

'Water Smart / Bath Fill' button is unavailable with the MSA Controller System.


DELUXE BATHROOM CONTROLLER

Using Water Smart/ Bath Fill

Press 'Water Smart / Bath Fill' button once. The 'Water Smart / Bath Fill' button will illuminate and a tone will sound. The 'Bath' indicator will also be displayed in the kitchen Controller monitor (Deluxe Models ONLY).

The voice prompt will say "The hot water system is ready. Open the hot water tap".

Open the hot water tap for the relevant shower or bath.

The 'In Use' indicator  will illuminate at all Deluxe Temperature Controller(s) and the shower will run or the bath will start to fill.

To Stop Water Smart / Bath Fill Operation

If you wish to stop the water flow whilst the 'Water Smart / Bath Fill' button is in operation, simply press the 'Water Smart / bath Fill' button. The 'Water Smart / Bath Fill' button will flash and the voice prompt will say "Hot water is not available. Turn off all hot water taps, and push the Bath Fill button". Follow the voice prompt instructions.

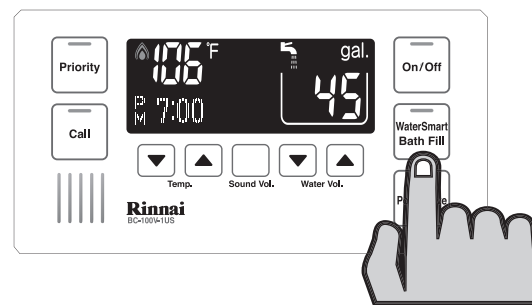
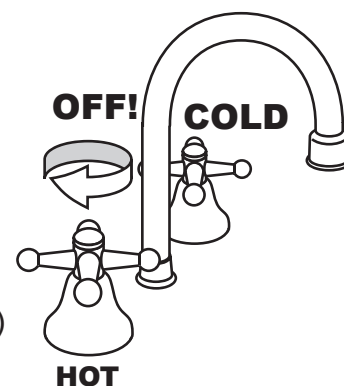
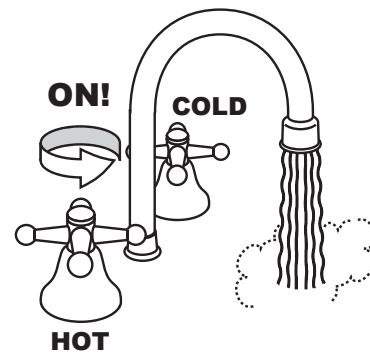
When Water Smart / Bath Fill Operations Finishes

Once the Water Smart / Bath fill operation finishes, the following events will occur:

1. The flow from the shower / bath hot water tap will cease.
2. The 'Water Smart / Bath Fill' button will flash.
3. The Kitchen Controller 'Bath' indicator will flash (Deluxe Models)
4. A tone will sound.
5. The voice prompt will say "Bath fill is complete. Turn off the bath hot water tap, and push the Bath fill button."

Follow the voice prompts instructions. Note that the hot water unit will not allow hot water to flow from any fixture until the 'Water Smart / Bath Fill' button has been changed.

6. The 'Water Smart / Bath Fill' button light on the Bathroom Controller and the 'Bath' indicator on the Kitchen Controller monitor will go out.



COMBINING CONTROLLERS AND DELUXE CONTROLLERS

Controller and Deluxe Controller can be combined and will function as described in other sections of this manual. Refer to the table on page 18

CONTROLLERS SET PATTERN/TEMPERATURE TABLES

Temperature controllers allows precise temperature control by the user. When used correctly, the hot water unit will deliver the selected temperature, even when the water flow is varied, or more than one tap is in use. Each Temperature Controller can be individually programmed, however the water heater unit can only deliver one set temperature at any time. The available temperatures (°F) are as follows:

Temperature Table by Models

model	temperature															
REU-V2532FFU REU-V2520FFU	98	100	102	104	106	108	110	115	120	125	130	135	140	—	—	—
REU-V2520FFUC	—	—	—	—	—	—	—	—	120	125	130	135	140	150	160	185
REU-V2532FFUC	98	100	102	104	106	108	110	115	120	125	130	135	140	150	160	185
Approx. temperature (°C)	37	38	39	40	41	42	43	46	49	52	54	57	60	66	71	85

Suggested temperatures are:

Kitchen 120°F - 130°F, Shower 98°F - 110°F, Bath fill 102°F - 114°F

These temperatures are suggestions only. You may find higher or lower temperatures more comfortable. Maintaining lower temperatures helps save energy. To obtain water temperatures lower than 98°F, simply add cold water.

Deluxe Controllers are an optional extra. 'Controller' and 'Deluxe' Controllers can be installed together. Controllers allow temperature selection only. 'Deluxe' Controllers have temperature selection, bath fill and clock functions.

Controllers allow the water temperature to be set from the various locations where they are installed. The temperature selected will be available to all outlets. Below are the combination of Controllers that are offered by Rinnai:

Controllers Combination Pattern

Remote and Deluxe Controllers						
1	MC-91-1US	+	—	+	—	+
2	MC-91-1US	+	MC-91-1US	+	—	+
3	MC-91-1US	+	MC-91-1US	+	MC-91-1US	+
4	MC-91-1US	+	MC-91-1US	+	MC-91-1US	+
5	MC-91-1US	+	BC-100V	+	MC-100V	+
6	MC-91-1US	+	MC-91-1US	+	BC-100V	+

****See controller manual in controller carton box for more information detail.**

Water Smart / Bath Fill Temperature Table

	temperature											
water smart/ bath fill temperature	98	100	102	104	106	108	110	112	114	116	118	120
Approx. temperature (°C)	37	38	39	40	41	42	43	44	46	47	48	49

Water Smart / Bath Fill temperature cannot exceed 120 °F for the following commercial models with no by-pass: REU-V2520FFUC.

ERROR MESSAGES

The Rinnai Water Heater has the ability to check its own operation continuously. If a fault occurs, an Error Message will flash on the Digital Monitor of the Remote Controllers. This assists with diagnosing the fault, and may enable you to overcome a problem without a service call. Please quote the code displayed when inquiring about service.

NOTE: Failure to remedy faults may result in severe burns, scalds, and/or death.

Code Displayed	Fault	Remedy
03	Power interruption during Bath fill (Water will not flow on power reinstatement).	Turn off all hot water taps. Press ON/OFF twice.
10	Air Supply or Exhaust Blockage	Check that nothing is blocking the air intake or exhaust.
11	No Ignition	Check that the gas is turned on at the water heater, gas meter or cylinder.
12	Flame Failure Earthing Failure	Check that the gas is turned on at the water heater and gas meter. Check for obstructions in flue outlet.
14	Thermal Fuse	Service Call
16	Over Temperature Warning	Service Call
32	Outgoing Water Temperature Sensor Faulty	Service Call
33	Heat Exchanger Outgoing Water Temperature Sensor Faulty	Service Call
34	Combustion Air Temperature Sensor Faulty	Service Call
52	Mod. Solenoid Valve Answer Abnormal	Service Call
61	Combustion Fan Failure	Service Call
65	Water Flow Control Faulty (Does not stop flow properly).	Service Call
71	Solenoid Valve Driving Circuit Faulty	Service Call
72	Flame Sensing Device Faulty	Service Call
LC	Scale build-up in Heat Exchanger	Service Call
(00)	(When checking maintenance code history, "00" is substituted for "LC")	

MAINTENANCE & SERVICE INFORMATION

Warning: Always turn off the electrical power supply, the manual gas valve and the manual water control valve whenever servicing the unit.



The Rinnai Water Heater should be checked by a Properly Trained Technician once a year. A Properly Trained Rinnai Technician should perform any repairs that may be necessary.

The following items should be checked each inspection:

- 1) The area around the Rinnai unit should be free from combustible materials such as cloth, vegetation and building materials. (see page 8)
- 2) Check burners for presence of foreign debris, insects or bugs. These items are not covered by the unit's warranty.
- 3) Remove and clean the inlet water filter.
- 4) Keep the appliance area clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- 5) Do not obstruct flow of combustion and ventilation air.

In the case of any fault or error message from the Rinnai Water Heater, first turn all hot water taps off. Wait for 5 seconds. Turn the hot water tap back on. If the error message still remains, call your Rinnai Authorized Service Representative or Rinnai at 800-621-9419.

Should overheating occur or the gas supply fail to shutoff, turn off the manual gas control valve to the appliance.



DO NOT ATTEMPT TO SERVICE YOUR Rinnai YOURSELF.

Call a Rinnai Authorized Service Technician or call your installer.

MAINTENANCE & SERVICE INFORMATION

MAINTENANCE SUGGESTIONS

This water heater has been designed and constructed for a long performance life when installed and operated properly under normal conditions. Regular inspections, as outlined in this section, are strongly recommended as a means of keeping your heater operating efficiently.

1. Cleaning

The water heater must be cleaned annually.

Keep the water heater clear of dust and debris especially in and around burner.

Cleaning procedures for the Rinnai Water Heater are as follows:

- 1) Turn off and disconnect electrical power. Allow to cool for one hour.
- 2) Remove the Front Panel by removing screws. See parts breakdown on panels.
- 3) Use pressurized air to remove dust from around main burner.
- 4) Use soft dry cloth to wipe cabinet.

DO NOT DAMAGE OR DISTORT ANY PARTS OF HEATER.

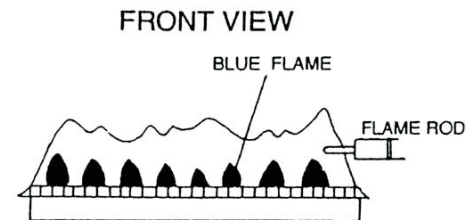
DO NOT USE WET CLOTH OR SPRAY CLEANERS ON BURNER.

2. Visual check of main burner flames.

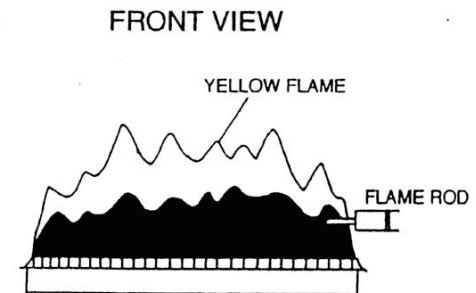
The burner must flame evenly over the entire surface when operating correctly. The flame must burn with a clear, blue, stable flame. See the parts breakdown of the burner for the location of view ports. Any and all parts removed for inspection or service must be replaced before operating the unit. The flame pattern should be as shown in the following Figures.

VISUAL CHECK

SATISFACTORY



UNSATISFACTORY



* VENT MAINTENANCE * VENT SYSTEM

Must be checked annually for blockage or deterioration. See vent installation instructions.

* MAINTENANCE- ELECTRIC MOTORS

Motors are permanently lubricated and need no lubrication. Keep fan and motor free of dust and dirt, clean annually.

TROUBLE SHOOTING AND COMMON QUESTIONS

Q - *I don't have any hot water when I open the tap!*

A - Make sure there is gas, water and electricity to the Rinnai Water Heater (the power is turned on and the gas is turned on)

Q - *When I was using the hot water, the water got cold!*

A - If you adjusted the flow from the tap to lessen it, you may have gone below the minimum flow required. The Rinnai Water Heater requires a minimum flow rate to operate (see specification page for flow rate of your unit). If you mix the water with a tap and attempt to get a temperature well below the temperature being controlled by the unit, it may drop the flow below the desired minimum flow rate. Decrease the temperature supplied by the Rinnai Water Heater at the remote control or increase your total flow.

Q - *White smoke comes out of the exhaust!*

A - During colder weather when the exhaust temperature is hotter than the air, the exhaust fumes condense producing white steam.

Q - *When I open a hot tap. I do not immediately get hot water!*

A - Hot water must travel through your plumbing from the Rinnai Water Heater to the faucet. The time period for hot water to reach your fixture is determined by the amount of water in your plumbing system between your water heater and the fixture, water pressure, flow rate of fixture in use, etc.

Q - *After I turn off the hot water tap, the fan on the Rinnai Water Heaters continues to run!*


A - The fan is designed to be on for 65 seconds after the flow of water stops. This is to ensure constant water temperatures during rapid starting and stopping, as well as exhausting any residual gas flue products from the unit.

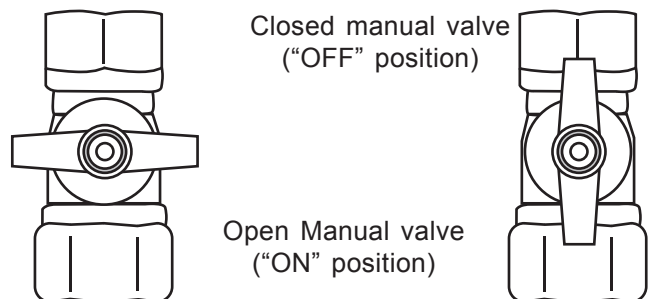
FOR YOUR SAFETY READ BEFORE OPERATING

Warning: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- A. This appliance does not have a pilot. It is equipped with a direct ignition device which automatically lights the burner. Do not try to light the burner by hand.
- B. BEFORE OPERATING: Smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
- WHAT TO DO IF YOU SMELL GAS**
- Do not try to light any appliance.
 - Do not touch any electric switch, do not 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.
- C. Use only your hand to operate remote control keypad. Never use tools. If the remote keypad doesn't work, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.


OPERATING INSTRUCTIONS

- 1) STOP! Read the safety information above before proceeding.
- 2) Set the thermostat to lowest setting.
- 3) Turn off all electric power to the appliance.
- 4) This appliance does not have a pilot. It is equipped with a direct ignition device which automatically lights the burner. Do not try to light the burner by hand.
- 5) Turn the manual valve located at gas inlet of the appliance clockwise  to "OFF".




- 6) Wait (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to next step.

OPERATING INSTRUCTIONS

- 7) Turn the manual valve located at the gas inlet of appliance counterclockwise  to "ON".
- 8) Turn on all electric power to the appliance.
- 9) Set thermostat to desired setting.
- 10) If the appliance will not operate, Follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

To Turn Off Gas To Appliance

- 1) Set the thermostat to lowest setting.
- 2) Turn off all electric power to the appliance if service is to be performed.
- 3) Turn the manual valve at gas inlet of appliance clockwise  to "OFF"

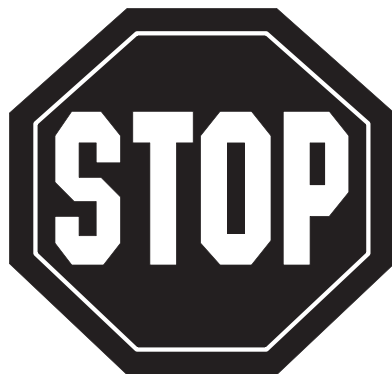
CARE & LIME CONDITION WARNING

Care of Unit's Exterior:

Keep the exterior cabinet clean. Use a soft cloth and warm water when cleaning the cabinet. **Do Not** use volatile substances such as benzene and thinners, as they may ignite, or cause fading of the paint.

Lime Condition Warning Signal:

If you notice "LC" flashing on the remote key pad, this means the unit is beginning to lime up, and **MUST** be flushed. Contact a qualified Rinnai service technician to flush the appliance. Failure to flush the appliance when "LC" is flashing, will cause damage to the heat exchanger. Damage caused by lime build up is not covered by the unit's warranty. To reset the LC Fault Code, turn the power off to the unit. Once power is restored, the LC code will be reset.



Installer's Instructions

This section is for the Qualified Installer only. **If you are not properly trained, you should not install this unit.** The warranty may be voided due to installation by a non-qualified installer. For information on Rinnai Training Courses, call
1-800-621-9419.

Contents of Installer's Manual

Warnings.....	26,27
Locating the Vent Terminal.....	28,29
Performance Data.....	30
Dimensions	31
Recommended Piping for Installation.....	32,33,34,35
Venting.....	36,37
Freeze Protection	38
Gas Piping Sizing Chart.....	39
Gas Piping Notes	40
Water Piping Notes	41
Pressure Relief Valve	41
Electrical Connection Notes	42
Lighting the Unit	43
Remote Controllers.....	44,45
Testing	46
Schematic Diagram	47

Rinnai

www.rinnai.us

800-621-9419

INSTALLER'S INSTALLATION INSTRUCTIONS

-Warnings- (Residential Unit)

This manual must be followed exactly.

- 1) Read the safety issues completely before installing the Rinnai Water Heater.
- 2) This water heater is suitable for residential water (potable) heating ONLY.
DO NOT use this water heater for space heating, combination space heating/
domestic water heating, or commercial water heating applications.
- 3) The Rinnai Water Heater is not suitable for use in pool or spa applications.
- 4) This unit is designed to be installed indoors using the proper vent piping to exhaust by-products of combustion to the outside environment. Contact your dealer or Rinnai for proper vent kits. **DO NOT** operate this unit without vent piping connected. Exhaust gasses must be expelled outside the home. All pipe joints shall be taped to help prevent leakage around joints. (Aluminum tape is recommended.)
- 5) Maintain proper space around the unit for proper servicing and operation. Minimum clearances from combustible materials are listed below.

Top of Heater	6 inches
Back of Heater	0 inch
Front of Heater	6 inches
Sides of Heater	2 inches
Floor	12 inches
Vent/Air Intake	0 inches

- 6) Installer must install a Pressure relief valve. Pipe pressure relief discharge to a drain or outside environment (see page 41 for pressure relief valve rating).
- 7) The appliance should be located in an area where leakage of the unit or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the appliance. The pan must not restrict combustion air flow.

INSTALLER'S INSTALLATION INSTRUCTIONS

-Warnings- (Commercial Unit)

This manual must be followed exactly.

- 1) Read the safety issues completely before installing the Rinnai Water Heater.
- 2) This water heater is suitable for water (potable) heating or space heating.
 - The piping and components connected to the Rinnai Water Heater must approved for use in portable water systems.
 - Toxic chemicals such as those used for boiler water treatment are NOT to be introduced to the portable water used for space heating.
 - The Rinnai Water Heater, if it will be used as a potable water source, must not be connected to a system that was previously used with a nonpotable water heating appliance.
 - When the system requires water for space heating at temperatures higher than required for other uses, a means such as mixing valve shall be installed to temper the water for other uses in order to reduce the scald hazard potential.
- 3) The Rinnai Water Heater is not suitable for use in pool or spa applications
- 4) This unit is designed to be installed indoors using the proper vent piping to exhaust by-products of combustion to the outside environment. Contact your dealer or Rinnai for proper vent kits. **DO NOT** operate this unit without vent piping connected. Exhaust gasses must be expelled outside the home. All pipe joints shall be taped to help prevent leakage around joints. (Aluminum tape is recommended.)
- 5) Maintain proper space around the unit for proper servicing and operation. Minimum clearances from combustible materials are listed below.

- 6) Installer must install a Pressure relief valve. Pipe pressure relief discharge to a drain or outside environment (see page 41 for pressure relief valve rating).

Top of Heater	6	inches
Back of Heater	0	inch
Front of Heater	6	inches
Sides of Heater	2	inches
Floor	12	inches
Vent/Air Intake	0	inches

- 7) The appliance should be located in an area where leakage of the unit or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the appliance.

INSTALLER'S INSTALLATION INSTRUCTIONS

Locating the vent terminal



PLEASE CONSULT WITH LOCAL CODES BEFORE INSTALLING THIS UNIT

REF	DESCRIPTION	U.S. Installations	Canadian Installations
A	Clearance above grade, veranda, porch, deck, or balcony	1 foot	1 foot
B	Clearance to window or door that may be opened	**1 foot	1 foot
C	Clearance to permanently closed window	*	*
D	Vertical clearance to ventilated soffit, eaves or overhang	3 feet	3 feet
E	Clearance to unventilated soffit, eaves or overhang	3 feet	3 feet
F	Clearance to outside corner	1 foot	1 foot
G	Clearance to inside corner	2 feet	2 feet
H	Clearance to each side of center line extended above meter/regulator assembly	*	3 feet within a height 15 feet. above the meter/regulator assembly
I	Clearance to service regulator vent outlet	*	3 feet
J	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	**1 foot	1 foot
K	Clearance to a forced air inlet into a building	3 feet	6 feet
L	Clearance above paved sidewalk or paved driveway located on public property	*	7 feet
M	Clearance under deck, veranda, porch, or balcony (open on 3 sides)	3 feet	3 feet
N	Vent Flue from wall (Flat or Pitched Roof)	2 feet	2 feet
O	Vertical between two terminals on the same wall above each other	5 feet	5 feet
P	Clearance between two vertical flue on the same plane	1 foot	1 foot
Q	Horizontal between two terminals on the same wall	1 foot	1 foot
R	Clearance between two Vertical flue on pitched roof above each other	5 feet	5 feet
S	Clearance from terminal facing a terminal	4 feet	4 feet

* For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CGA-B149, please use **clearances in accordance with local installation codes and the requirement of the gas supplier.**

** 4 feet for units other than Direct-Vent Appliance.

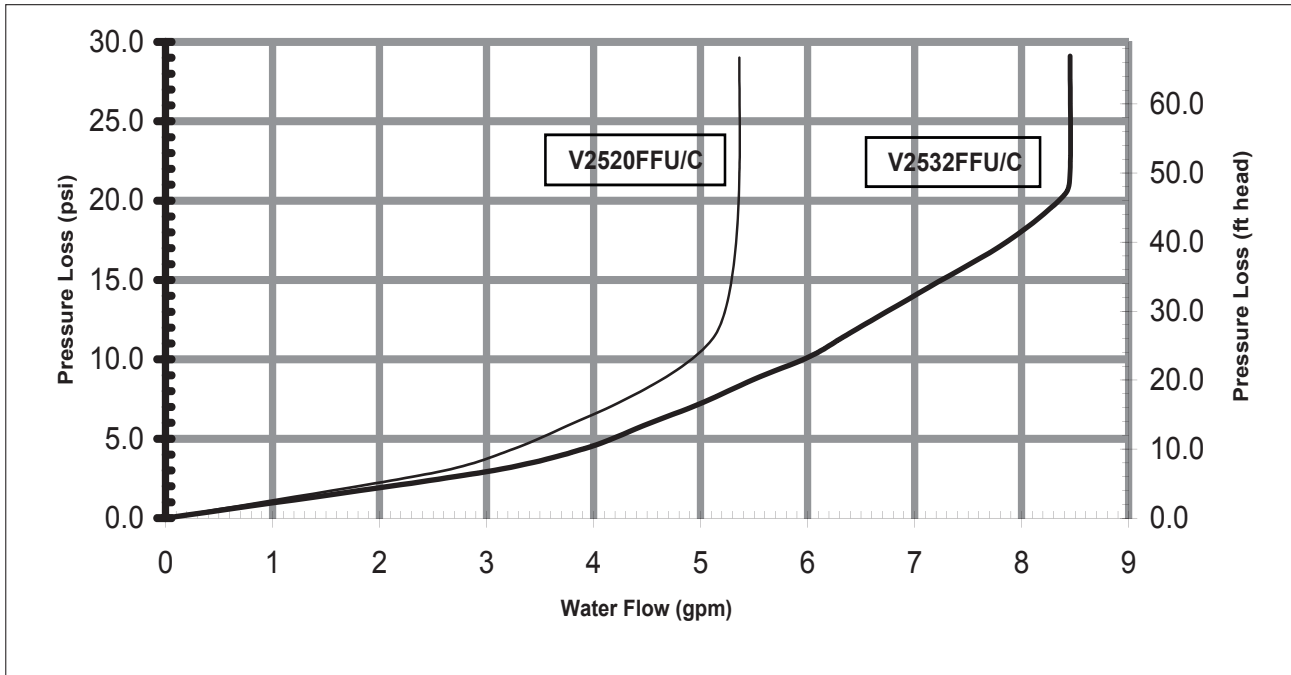


ONLY Rinnai Approved vent materials and components can be used to vent the water heaters.

When installing your Rinnai vent system, you **MUST** follow Rinnai's Venting Instructions found in each vent terminal box. These instructions provide the maximum allowable vent heights for both horizontal and vertical venting, how to cut the vent components, and pipe installations.

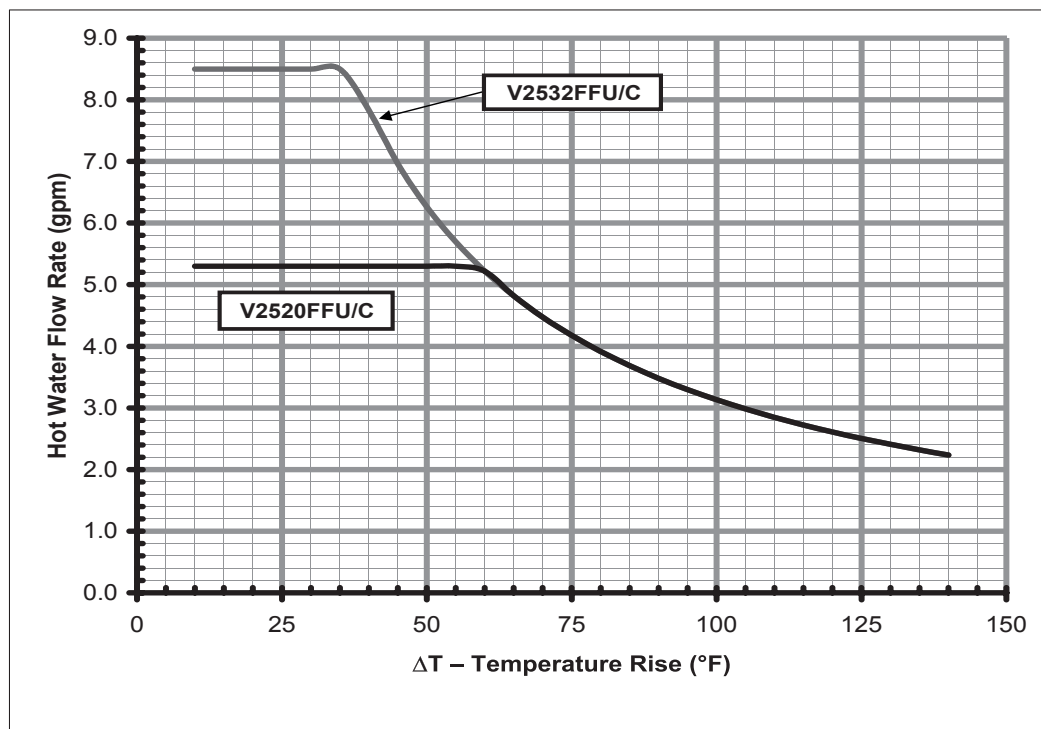
INSTALLER'S INSTALLATION INSTRUCTIONS

PRESSURE DROP CURVE



INSTALLER'S INSTALLATION INSTRUCTIONS

OUTLET FLOW DATA



INSTALLER'S INSTALLATION INSTRUCTIONS

RECOMMENDED PIPING FOR BASIC INSTALLATION

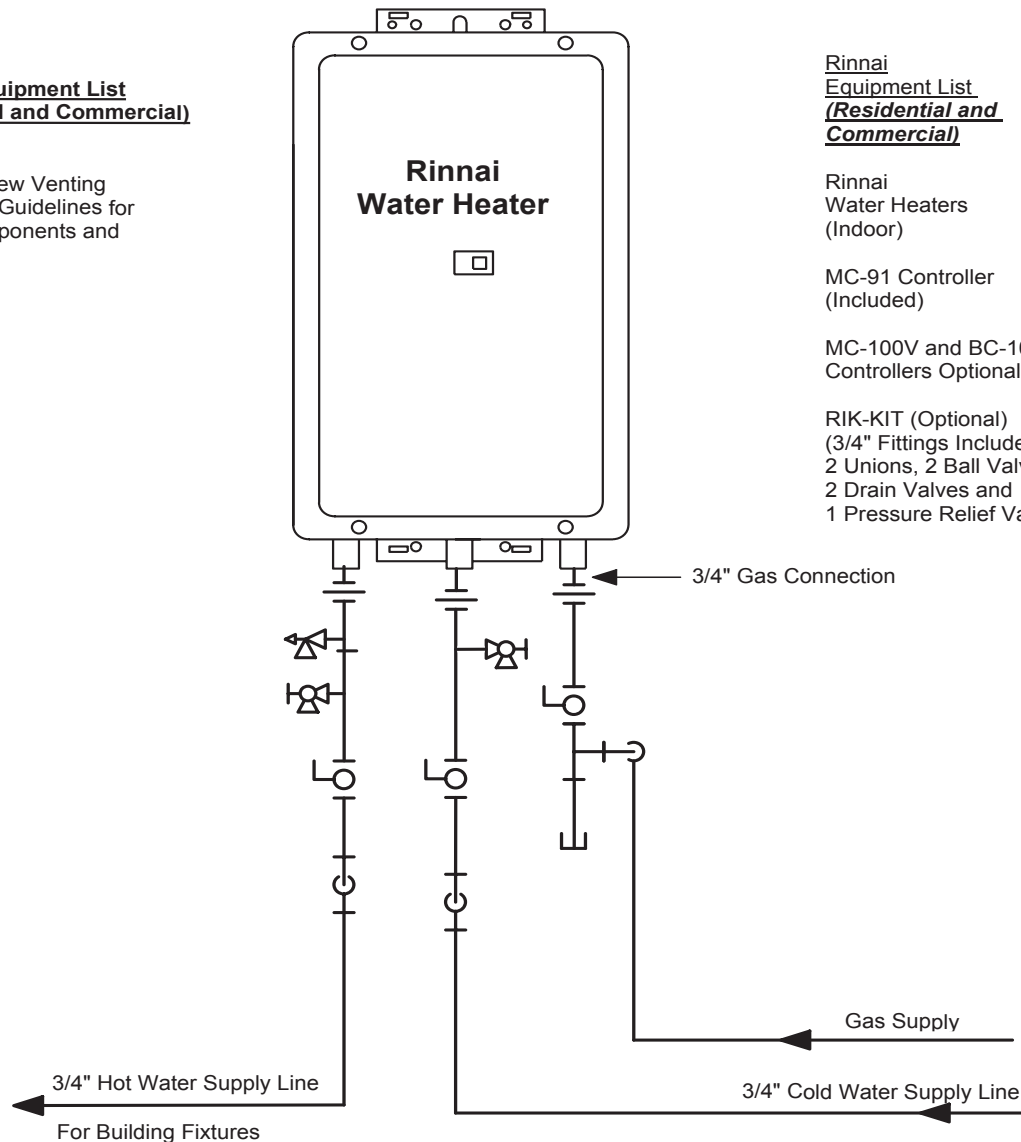
Venting Equipment List (Residential and Commercial)

Indoor Unit

Please Review Venting Instructions/Guidelines for Proper Components and Installation.

Rinnai Equipment List (Residential and Commercial)

	QTY
Rinnai Water Heaters (Indoor)	1
MC-91 Controller (Included)	1
MC-100V and BC-100V Controllers Optional	
RIK-KIT (Optional) (3/4" Fittings Include: 2 Unions, 2 Ball Valves, 2 Drain Valves and 1 Pressure Relief Valve.)	1



KEY

	3/4" Ball Valve		Pressure Regulator
	3/4" Union		Circulating Pump
	Check Valve		Boiler Drain Valve
	Pressure Relief Valve		Solenoid Valve

This is not an engineered drawing, it is intended only as a guide and not as a replacement for professionally engineered project drawings. This drawing is not intended to describe a complete system, it is up to the contractor/engineer to determine the necessary components for and configuration of the particular system being installed. The drawing does not imply compliance with local building code requirements. It is the engineer/contractor responsibility to ensure the installation is in accordance with all local building codes. Confer with local building officials before installation.

Rinnai

103 International Drive
Peachtree City, Georgia 30269

RINNAI WATER HEATERS

Domestic Hot Water - Standard Installation
1 Rinnai Water Heater

INSTALLER'S INSTALLATION INSTRUCTIONS

RECOMMENDED PIPING FOR CIRCULATION SYSTEMS

Notes:

PLEASE NOTE FOR RESIDENTIAL APPLICATIONS, THIS PIPING ARRANGEMENT MAINTAINS FULL WARRANTY:

**10 Years On Heat Exchanger
5 Years On Parts**

Commercial Application Warranty:

**5 Years On Heat Exchanger
5 Years On Parts**

Venting Equipment List (Commercial and Residential)

Indoor Unit

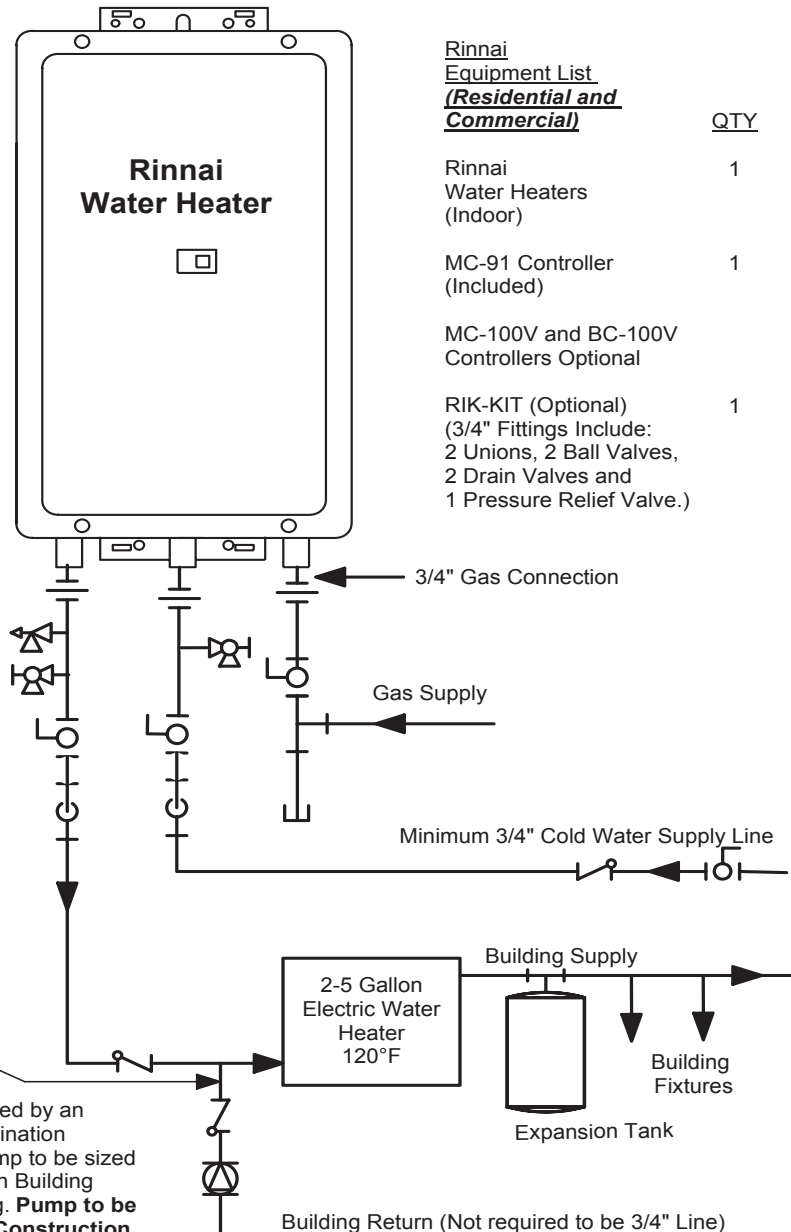
Please Review Venting Instructions/Guidelines for Proper Components and Installation.

Important: Install building return line to the hot supply as close as possible to the Rinnai Water Heater.

Pump Should be Controlled by an Aquastat, Timer or Combination Aquastat and Timer. Pump to be sized for Pressure Drop through Building Supply and Return Piping. **Pump to be of Bronze or Stainless Construction.**

Rinnai Equipment List (Residential and Commercial)

	QTY
Rinnai Water Heaters (Indoor)	1
MC-91 Controller (Included)	1
MC-100V and BC-100V Controllers Optional	
RIK-KIT (Optional) (3/4" Fittings Include: 2 Unions, 2 Ball Valves, 2 Drain Valves and 1 Pressure Relief Valve.)	1



KEY

	3/4" Ball Valve		Pressure Regulator
	3/4" Union		Circulating Pump
	Check Valve		Boiler Drain Valve
	Pressure Relief Valve		Solenoid Valve

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Rinnai

103 International Drive
Peachtree City, Georgia 30269

RINNAI WATER HEATERS

Domestic Hot Water - Circulation Systems
1 Rinnai Water Heater with Electric Storage Tank

INSTALLER'S INSTALLATION INSTRUCTIONS

OPTIONAL PIPING FOR CIRCULATION SYSTEMS

Note:

PLEASE NOTE FOR RESIDENTIAL APPLICATIONS, THIS PIPING ARRANGEMENT REDUCES WARRANTY TO THE FOLLOWING:

**3 Years On Heat Exchanger
3 Years On Parts**

Commercial Application Warranty:

**5 Years On Heat Exchanger
5 Years On Parts**

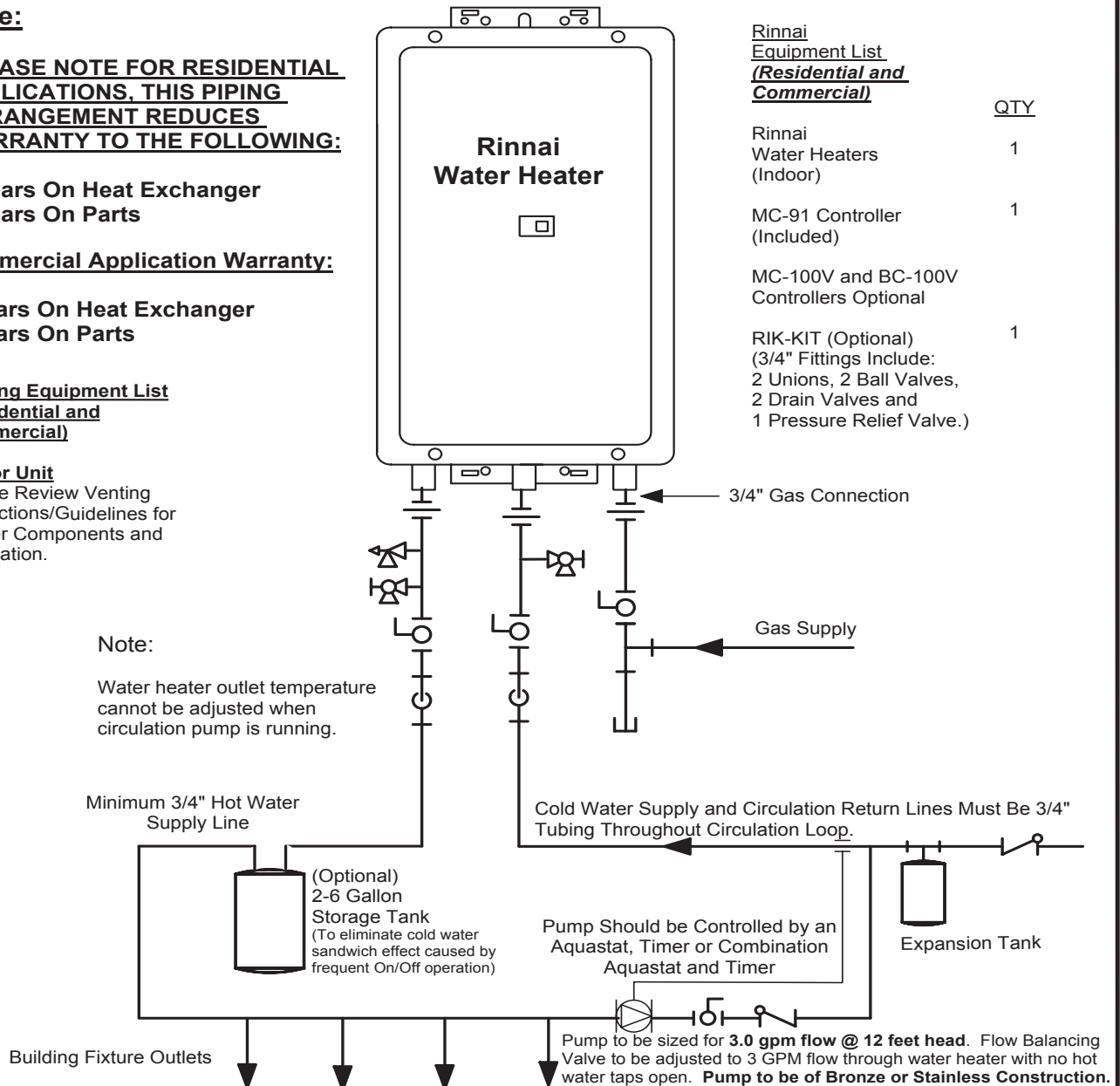
Venting Equipment List (Residential and Commercial)

Indoor Unit

Please Review Venting Instructions/Guidelines for Proper Components and Installation.

Rinnai Equipment List (Residential and Commercial)

	<u>QTY</u>
Rinnai Water Heaters (Indoor)	1
MC-91 Controller (Included)	1
MC-100V and BC-100V Controllers Optional	
RIK-KIT (Optional) (3/4" Fittings Include: 2 Unions, 2 Ball Valves, 2 Drain Valves and 1 Pressure Relief Valve.)	1



KEY

	3/4" Ball Valve		Pressure Regulator
	3/4" Union		Circulating Pump
	Check Valve		Boiler Drain Valve
	Pressure Relief Valve		Solenoid Valve

This is not an engineered drawing, it is intended only as a guide and not as a replacement for professionally engineered project drawings. This drawing is not intended to describe a complete system, it is up to the contractor/engineer to determine the necessary components for and configuration of the particular system being installed. The drawing does not imply compliance with local building code requirements. It is the engineer/contractor responsibility to ensure the installation is in accordance with all local building codes. Confer with local building officials before installation.

Rinnai

103 International Drive
Peachtree City, Georgia 30269

RINNAI WATER HEATERS

Domestic Hot Water with Circulation
1 Rinnai Water Heater

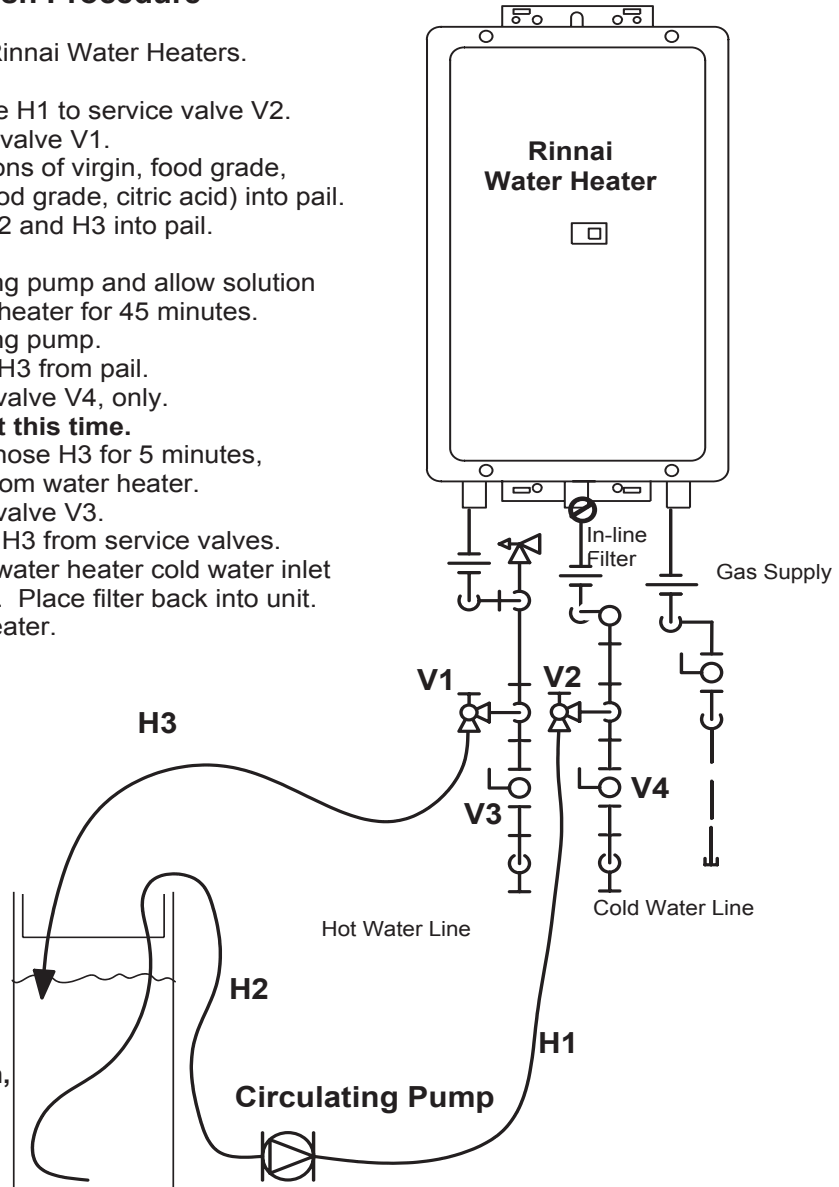
INSTALLER'S INSTALLATION INSTRUCTIONS

RECOMMENDED SCALE FLUSH PROCEDURE

RINNAI Water Heater Flush Procedure

1. Disconnect power to the Rinnai Water Heaters.
2. Close valves V3 and V4.
3. Connect pump outlet hose H1 to service valve V2.
4. Connect drain hose H3 to valve V1.
5. Pour approximately 4 gallons of virgin, food grade, white vinegar (or virgin, food grade, citric acid) into pail.
6. Place free ends of hose H2 and H3 into pail.
7. Open valves V1 and V2.
8. Turn on power to circulating pump and allow solution to circulate through water heater for 45 minutes.
9. Turn off power to circulating pump.
10. Remove free end of hose H3 from pail.
11. Close valve V2 and open valve V4, only.
Do NOT open valve V3 at this time.
12. Allow water to flow out of hose H3 for 5 minutes, rinsing cleaning solution from water heater.
13. Close valve V1 and open valve V3.
14. Disconnect hoses H1 and H3 from service valves.
15. Remove in-line filter from water heater cold water inlet and clean out any residue. Place filter back into unit.
16. Restore power to water heater.

5 gallon pail of virgin, food grade, white vinegar (or virgin, food grade, citric acid).



KEY

	3/4" Ball Valve		Pressure Regulator
	3/4" Union		Circulating Pump
	Check Valve		Boiler Drain Valve
	Pressure Relief Valve		Solenoid Valve

This is not an engineered drawing, it is intended only as a guide and not as a replacement for professionally engineered project drawings. This drawing is not intended to describe a complete system, it is up to the contractor/engineer to determine the necessary components for and configuration of the particular system being installed. The drawing does not imply compliance with local building code requirements. It is the engineer/contractor responsibility to ensure the installation is in accordance with all local building codes. Confer with local building officials before installation.

Rinnai

103 International Drive
Peachtree City, Georgia 30269

RINNAI WATER HEATERS

Domestic Hot Water - Scale Flush Procedure
1 Rinnai Water Heater

INSTALLER'S INSTALLATION INSTRUCTIONS

Venting

The maximum allowable “Equivalent Length (D)” of vent pipe for the Rinnai water heater is 41 feet (as determined using the formula below). If “D” is greater than 41, the vent/air intake piping is too long or there are too many elbows, redesign the vent pipe run.

$$D = L + (B_{90} \times 6) + (B_{45} \times 1.5)$$

D = Total Equivalent Length of vent system.

L = Length of vent/air intake in feet.

B₉₀ = Number of 90° elbows.

B₄₅ = Number of 45° elbows.

To help prevent condensation in the vent/air intake piping, the combustion fan has two dip switch settings. Dip switch number 1 is shipped from the factory set to the “OFF” position; this is suitable for the maximum vent/air intake length.

Depending upon the vent/air intake length, Dip switch No. 1 may need to be adjusted to compensate fan speed. Read the following instructions, to determine which position this switch should be placed in.

When the Equivalent Length of vent pipe, D, is more than 22 feet, leave dip switch number 1 in the “OFF” position.

When the Equivalent Length of vent pipe, D, is 22 feet or less, dip switch number 1 must be moved to the “ON” position.

Dip switch # 1 is located in the top row of dip switches, 1 through 8 on the PC board. See the diagram below to identify the proper switch. If you do not understand the following information, contact your installer or dealer for assistance.

Do not alter dip switch number 1 before using formula, to determine the proper setting.

Example #1:

You have 6 feet of vent pipe, and two 90° elbows.

$$D = 6 + (2 \times 6) + (0 \times 1.5)$$

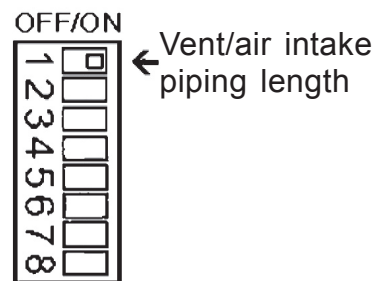
D = 18 Dip switch number 1 should be “ON”

Example #2:

You have 15 foot of vent pipe, one 90° elbow and two 45° elbows.

$$D = 15 + (1 \times 6) + (2 \times 1.5)$$

D = 24 Dip switch number 1 should be “OFF”



Warning: All other dip switches with the exception of dip switch No.1, shown in the diagram above, **MUST NOT** be altered. Unauthorized adjustments can cause property damage, personal injury, scalding, or death.

INSTALLER'S INSTALLATION INSTRUCTIONS

Venting

Vent/Air Intake for Internal "FFU" model Hot Water Systems

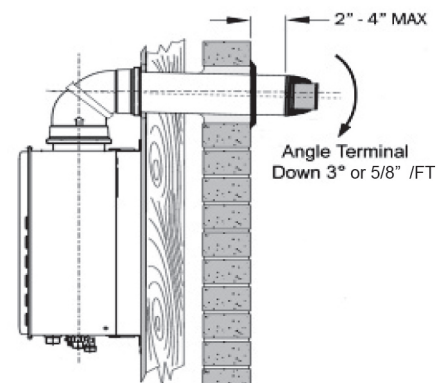
The only vent/air intake system approved for use with this appliance by CSA is the Rinnai/ Ubbink vent system or the Heatfab Saf-T Vent SC vent system. The vent system must vent directly to the outside of a building and use outside air for combustion as indicated in the diagrams below. The minimum and maximum wall thickness for sidewall venting are: Minimum = 4" and Maximum = 20".

Horizontal Direct Vent Installation

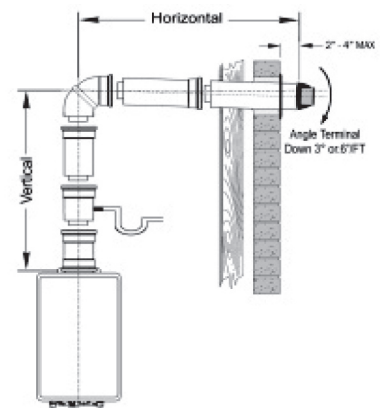
The Rinnai tankless water heater may be installed on the internal surface of an external wall using a standard vent system kit. A typical installation is shown in the diagram to the right. The standard vent system kit consists of:

- One discharge adapter
- One discharge terminal

Horizontal Direct



Horizontal Extension



Horizontal Extension Installation

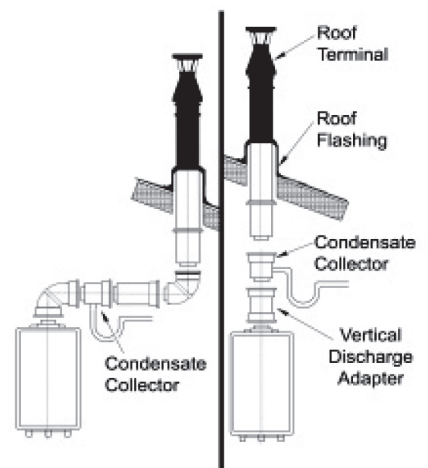
The Rinnai Tankless water heater may also be installed on an internal wall which is near to an external wall. This can be done using a combination of extension tube(s), 90° or 45° elbow(s).

The maximum "HORIZONTAL EQUIVALENT LENGTH" of the vent/air intake system is 41 feet, as calculated using the formula on previous page (i.e. an installation with 23 feet of extension tubes, and three 90° elbows). An approved condensation collar must be installed on any vent/air intake system exceeding 5 feet horizontally or Vertically.

Vertical Direct Vent Installation

The Rinnai tankless water heater can also be installed on flat or pitched roofs. Vertical Venting can be achieved using a combination of vent accessories. The maximum length of a vertical vent/air intake system is 21 linear feet with a maximum of 3 bends. An approved condensation collar must be installed on any vent/air intake system exceeding 5 feet.

Vertical Direct



Position the condensate collector as close to the water heater as possible.

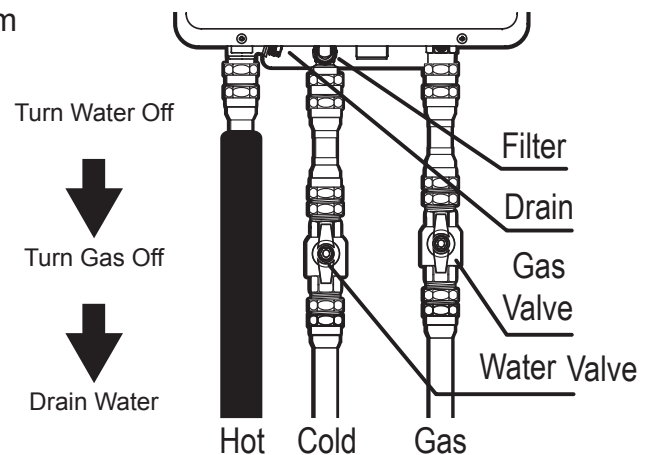
When using a condensate collector always pitch the vent back to the collector. Condensate must drain per local codes.

INSTALLER'S INSTALLATION INSTRUCTIONS

Freeze Protection

If the Rinnai water heater is disconnected from either the electrical supply or gas supply, or if there is an error that prevents the water heater from functioning normally, there is NO FREEZE PROTECTION. Freeze protection of the water heater is only possible when electricity, gas supply and normal water heater functions are enabled. If you expect freezing conditions while either electricity or gas supply is interrupted, water must be completely drained from water heater.

This water heater and venting system is designed to withstand temperatures to as low as -30°F, so long as electricity and gas are supplied to the product and normal water heater functions are enabled. If either gas or electricity is interrupted NO FREEZE PROTECTION is available.



In climates with below freezing temperatures, you must install an Auto-Drain-Down Solenoid Valve system in your plumbing system. This is the only way you can prevent freeze damage in the event of a power failure, interruption of gas supply or other functional failure within the water heater.

There is no warranty on freeze damaged water heater components.



Rinnai is continually updating and improving products, therefore, specifications are subject to change without prior notice. Local, state, provincial and federal codes must be adhered to prior to installation.

Climate conditions can dictate special applications. Please refer to local codes before installing product.

INSTALLER'S INSTALLATION INSTRUCTIONS

Gas Piping Sizing Chart

Capacity Table for Natural Gas
cubic feet / hour

(table assumes .3 inch pressure drop, specific gravity of .60)

Nominal Iron Pipe Size Inches	Length of Pipe in Feet													
	10	20	30	40	50	60	70	80	90	100	125	150	175	200
3/4	278	190	152	130	115	105	96	90	84	79	72	64	59	55
1	520	350	285	245	215	195	180	170	160	150	130	120	110	100
1-1/4	1050	730	590	500	440	400	370	350	320	305	275	250	225	210
1-1/2	1600	1100	890	760	670	610	560	530	490	460	410	380	350	320

After determining the length of pipe required select the pipe size that will supply the cubic feet per hour of gas required for the input rating of the Rinnai Water Heaters. The formula for figuring the cubic feet per hour required is:

$$\text{CFH} = \frac{\text{Gas Input of Rinnai water heater (BTU/HR)}}{\text{Heating Value of Gas (BTU/FT}^3\text{)}}$$

*Gas input requirement is on the water heater data plate

*The heating value of the gas can be obtained from the local Natural Gas Utility

Capacity Table for LP Gas

BTUH of undiluted liquified petroleum gases

(table assumes 11 inches of water column pressure at the inlet, .5 inch drop)

Nominal Iron Pipe Size Inches	Length of Pipe in Feet												
	10	20	30	40	50	60	70	80	90	100	125	150	
1/2	275	189	152	129									
3/4	567	393	315	267	237	217	196	185	173	162	146		
1	1071	732	590	504	448	409	378	346	322	307	275	252	
1-1/4	2205	1496	1212	1039	913	834	771	724	677	630	567	511	

INSTALLER'S INSTALLATION INSTRUCTIONS

Gas Piping Notes

- 1) A manual gas control valve must be placed upon the gas supply line to the Rinnai Water Heater. A union can be used on the connection above the shut off valve for the future servicing or disconnection of the unit.
- 2) Check the type of gas and the gas inlet pressure before connecting the Rinnai Water Heater if the Rinnai Water Heater is not of the gas type that the building is supplied with, DO NOT connect the water heater. Contact the dealer for the proper unit to match the gas type.
- 3) Minimum and Maximum Gas pressures are listed below:
 - * Minimum value is for input adjustment

Natural Gas: Minimum 6" WC
 Maximum 10.5" WC

Propane Gas: Minimum 10"WC
 Maximum 13.5" WC

WARNING: **Conversion of this unit from natural gas to propane or propane to natural gas CANNOT be done in the field.**

- 4) After completion of gas pipe connections, all joints including the heater must be checked for gas-tightness by means of leak detector solution, soap and water, or an equivalent nonflammable solution, as applicable. **Caution:** Since some leak test solutions, including soap and water, may cause corrosion or stress cracking, the piping must be rinsed with water after testing, unless it has been determined that the leak solution is non-corrosive.
- 5) The Rinnai Water Heater must be leak tested before it is placed into operation.
- 6) The Rinnai Water Heater and its individual shut-off valve must be disconnected from the gas supply piping system when pressure testing of the gas supply piping system at test pressures greater than 1/2 psi (3.5 kPa).
- 7) Always use approved connectors to connect the unit to the gas line. Always purge the gas line of any debris before connection to the water heater.
- 8) The Rinnai Water Heater must be isolated from the gas supply piping system by closing it's individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psi (3.5 kPa).
- 9) The Rinnai Water Heater Installation location must provide adequate Combustion and Ventilation airflow.

INSTALLER'S INSTALLATION INSTRUCTIONS

Water Piping Notes

- 1) A manual water control valve must be placed upon the water inlet connection to the Rinnai Water Heater before it is connected to the water line. Unions may be used on both the hot/cold water supply lines, for the future servicing or disconnection of the unit.
- 2) All soldering materials and piping must be compatible with potable water.
- 3) Purge the water line to remove from it all debris and air. Debris will damage the Rinnai Water Heaters.
- 4) There is a wire mesh strainer on the Rinnai Water Heater's inlet to discourage the introduction of debris to the unit. It will need to be cleaned periodically. **DO NOT** operate unit without filter in place. Clean this filter before leaving the job site.
- 5) It is recommended that auto drain down solenoids are installed in all applications below freezing.

WARNING: DO NOT reverse the inlet and outlet (cold and hot water) connections on the unit. This would cause the Rinnai Water Heater to operate dangerously or not at all.

INSTALLER'S INSTALLATION INSTRUCTIONS

Pressure Relief Valve

- 1) ANSI code calls for the addition of an approved pressure relief valve to all water heating systems.
- 2) The pressure relief valve must meet the following criteria: The relief valve must comply with the standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems ANSI Z21. 22 and/or the standard CAN1-4.4 Temperature, Pressure, Temperature and Pressure Relief Valves and Vacuum Relief Valves. This relief valve must be rated up to 150 PSI of pressure.
- 3) The relief valve should be added to the hot water outlet line per manufacturer's instructions. **DO NOT** place any other type valve or shut off device between the relief valve and the hot water heater.
- 4) The discharge from the pressure relief valve should be piped to the ground or into a drain system to prevent exposure or possible burn hazards to humans or other plant or animal life. Water discharged from the relief valve could cause severe burns instantly, scalds and/or death.
- 5) Do not plug the relief valve and do not install any reducing fittings or other restrictions in the relief line. The relief line should allow for complete drainage of the valve and the line.
- 6) If a relief valve discharges periodically, this may be due to thermal expansion in a closed water supply system. Contact the water supplier or local plumbing inspector on how to correct this situation. Do not plug the relief valve.
- 7) Pressure relief valve must be manually operated once a year to check for correct operation. Caution: See Item 4 before manually operating relief valve.
- 8) Should overheating occur or the gas supply fail to shut off, turn off the manual gas valve on the Rinnai.

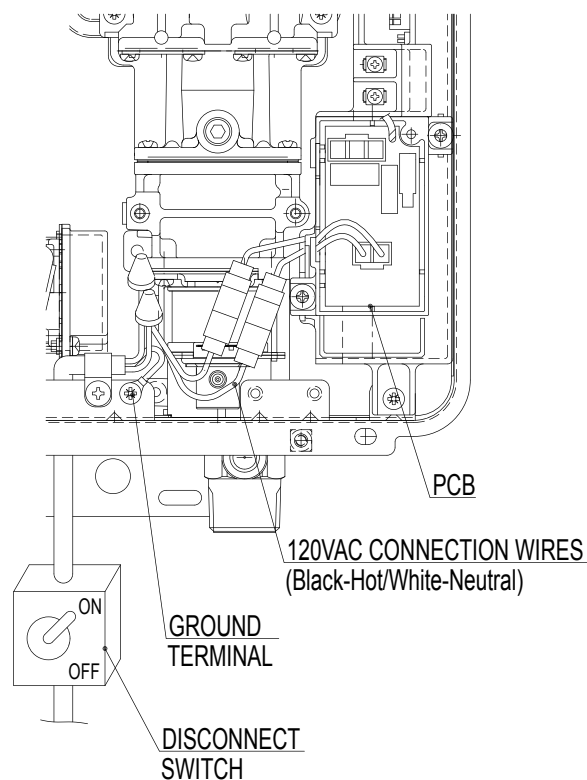
INSTALLER'S INSTALLATION INSTRUCTIONS

Electrical Connection Notes

WARNING: The Rinnai Water Heaters must be electrically grounded in accordance with local codes or in the absence of local codes with the most recent edition of the National Electrical Code, ANSI/NFPA 70. In Canada, all electrical wiring to the Rinnai Water Heaters should be in accordance with local codes and the Canadian Electrical Code, CSA C22.1 Part 1. Do not rely on the gas or water piping to ground the metal parts of the water heater.

CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

- 1 The Rinnai Water Heater requires 120VAC/60 HZ. Power from a properly grounded circuit.
- 2 An on/off switch must be provided and installed for the incoming 120VAC power.
- 3 Wire the Rinnai Water Heater exactly as shown on the inside of the cover panel. The black wire is the hot leg wire; the white wire is the neutral wire.
- 4 A green screw is provided in the junction box for the grounding connection.



Your disconnect switch should be a type that is suitable for outdoor use. Check National Electrical Codes for proper type switch to use in your area.

INSTALLER'S INSTALLATION INSTRUCTIONS

Lighting the Unit

WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- 1) This water heater does not have a pilot. It is equipped with a direct ignition device which automatically lights the burner. DO NOT TRY TO LIGHT THE BURNER BY HAND.
- 2) Before operating the Rinnai Water Heater smell all around the unit for gas. Be sure to smell near the ground as leaking gas may settle there.
- 3) Turn the manual gas control valve on.

STOP!! READ THE SAFETY ISSUES ON PAGES 8

- 4) Turn on any hot water tap. The Rinnai Water Heater should light and begin heating your water.

If the Rinnai Water Heater fails to light

- 1) DO NOT ATTEMPT TO LIGHT BY HAND.
- 2) Turn off the electrical power to the unit.
- 3) Turn off the manual gas control.
- 4) Wait 5 minutes, if you smell gas, go to a neighbor's house and call the gas company or the fire department. If you do not smell gas, go to the next step.
- 5) Turn the manual gas control valve on.
- 6) Turn the electrical power to the unit on.
- 7) Turn on any hot water tap.
- 8) If the unit still fails to light, turn off the electricity and gas to the unit and call Rinnai 1-800-621-9419.

INSTALLER'S INSTALLATION INSTRUCTIONS

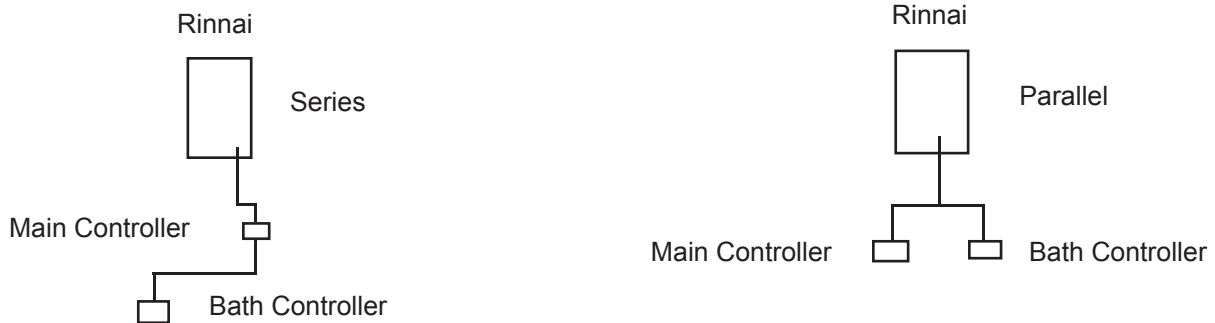
Remote Controllers- General

The remote controls for the Rinnai Water Heater allow the customer to control the functions of the water heater and to diagnose certain fault conditions.

Before installing the remote controllers, determine the most convenient location(s). When deciding on the best location for the remote controllers, please consider the following items:

- 1) Place the controllers out of reach of small children.
- 2) Avoid locations where remote controller(s) will become hot. (over the stove, near the oven or a radiant heater.
- 3) Avoid direct sunlight. (The digital monitor can be difficult to read in direct sunlight)
- 4) Avoid areas where remote controller(s) can be splashed with cooking water, oil or sauce.
- 5) Remote controller(s) cables carry low voltage, 12VDC digital.

Every installation is different



Remote controller(s) can be wired in series or in parallel depending on the distance from the Rinnai Water Heaters to the controllers.



NOTE When the Temperature Controller(s) is used in public applications, it should be installed where it can not be adjusted by the public (i.e. a maintenance room or manager's office).

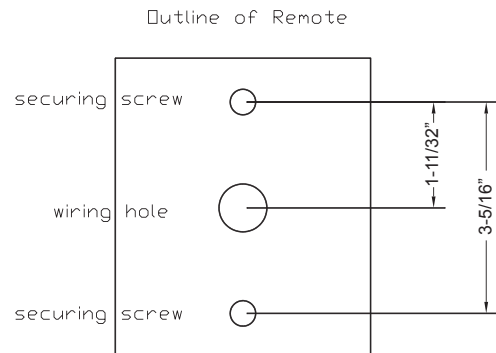


NOTE The Temperature Controller(s) have default temperature settings for The Rinnai Water Heater models. See page 18 for details.

INSTALLER'S INSTALLATION INSTRUCTIONS

Remote Controllers - Installation

- 1) Determine a suitable location for the controller.
- 2) Make three holes on the wall as shown.
- 3) Run the cable between the controller and the Rinnai Water Heater or the controller and the other controller.



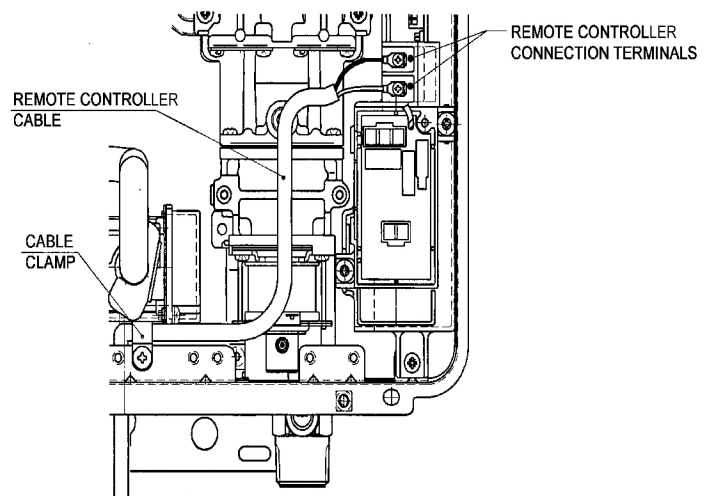
- 4) Remove the face plate from the remote controller(s), using a screw driver.
- 5) Connect the cable to the remote controller(s).
- 6) Mount the controller to the wall using the holes drilled in step 2.

Note: If the cable cannot be run in the wall cavity, the plastic knockout should be removed from the top or bottom of the controller to allow flush mounting with the wall

- 7) Disconnect the power from the Rinnai Water Heater.
- 8) Remove the cover of the Rinnai Water Heater.
- 9) Remove the plastic cover from the PCB and electrical connections.

DO NOT ATTEMPT TO CONNECT THE REMOTE CONTROLLERS WITH THE POWER ON, THERE'S 120 VOLT POTENTIAL, NEXT TO THE REMOTE CONTROLLER CONNECTIONS INSIDE THE UNIT. All service and wiring should be performed by a certified installer.

- 10) Thread the cable through the access hole at the base of the unit and connect the wires to the controller terminals on the right hand side bottom of the PCB.
- 11) Secure the controller cable using the clamp provided.
- 12) Replace plastic cover over PCB and then replace the cover of the Rinnai Water Heaters.



INSTALLER'S INSTALLATION INSTRUCTIONS

Testing

- 1) Turn on the gas and water.
- 2) Check for water and gas leaks. Use soapy water to test for gas leaks.
- 3) Remove pressure test point screw, attach pressure gauge to test point.
- 4) Turn Power on.
- 5) Open any hot water tap fully.
- 6) Check test point or supply pressure in water columns per inch.

Natural Gas Inlet and Manifold Gas Pressure by Model

REU2520FFU Series	6" - 10.5"	0.77"	3.7"
REU2532FFU Series	6" - 10.5"	0.77"	3.7"

Propane Gas Inlet and Manifold Gas Pressure by Model

REU2520FFU Series	10" - 13.5"	0.93"	4.2"
REU2532FFU Series	10" - 13.5"	0.93"	4.2"

NOTE: The pressure may be low due to too little flow, too high an incoming temperature, and/or undersized gas piping. Examine these areas before determining that the pressure needs to be adjusted. **Contact Rinnai before adjusting manifold pressures at 1-800-621-9419. Failure to contact Rinnai, could void unit's warranty.**

- 7) If it is determined that the gas pressure needs adjusting, first check the incoming pressure at the test point on the gas inlet. If it is correct follow the adjusting procedure contained in the pouch of the unit EXACTLY.

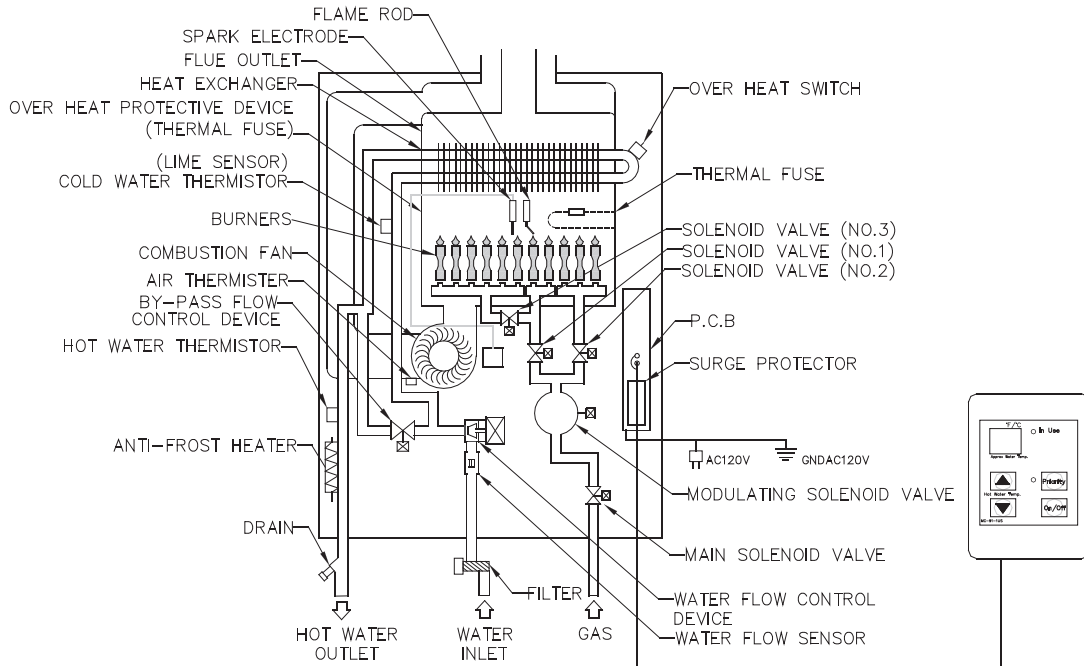
The regulator is pre-set at the factory, it should not need resetting.

- 8) Turn the hot water off. Turn the power off. Remove the pressure gauge and replace the test point screw. Check for a gas leak around the test point screw.
- 9) Replace the front cover.
- 10) Turn the power back on.
- 11) Check the operation of the unit. Check the operation of each of the remote controller(s). Check the operation of the Power failure protection system.
- 12) Explain the proper operation of the Rinnai Water Heaters to the customer.

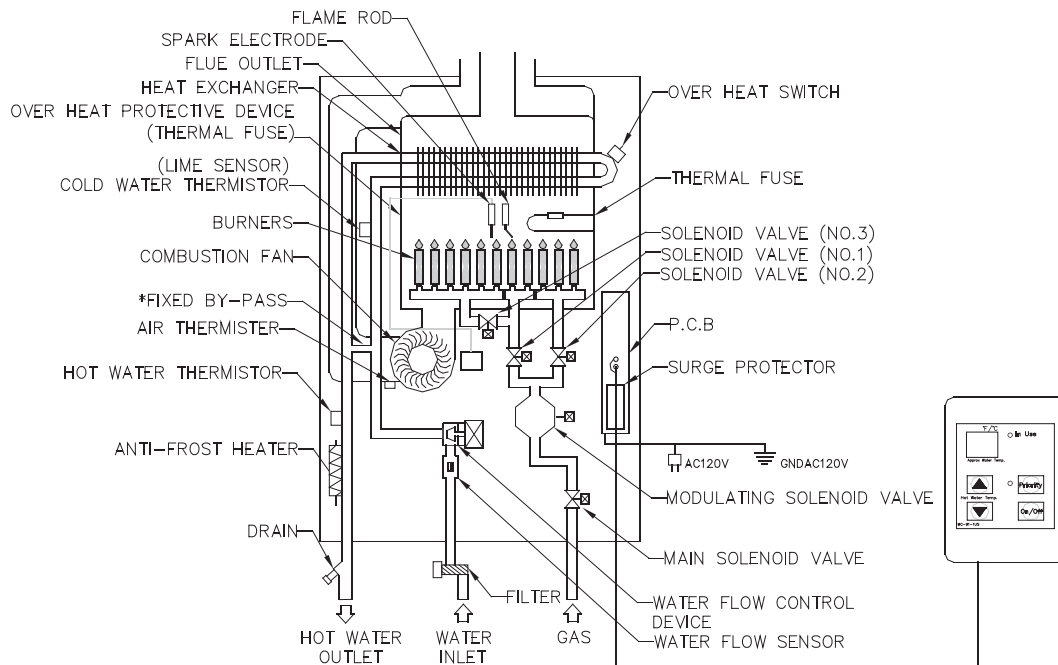
INSTALLER'S INSTALLATION INSTRUCTIONS

Schematic Diagram

2532FFU (R85) & 2532FFUC (C85)



2520FFU (R53) - (Fixed By-Pass) *2520FFUC (C53) - (No By-Pass)



Ask about

WWW.RINNAI.US OR 800-621-9419

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