

# USER'S INFORMATION MANUAL

**MVB**  
*Modulating Vertical Boiler*



## Models 504-2004 Type H



**WARNING:** If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids or other combustible materials in the vicinity of this or any other appliance. To do 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; 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.

**AVERTISSEMENT:** Assurez-vous de bien suivre les instructions données dans cette notice pour réduire au minimum le risque d'incendie ou d'explosion ou pour éviter tout dommage matériel, toute blessure ou la mort.

Ne pas entreposer ni utiliser d'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil ou de tout autre appareil.

### QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:

- Ne pas tenter d'allumer d'appareils.
- Ne touchez à aucun interrupteur. Ne pas vous servir des téléphones dans le bâtiment où vous vous trouvez.
- Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
- Si vous ne pouvez rejoindre le fournisseur de gaz, appelez le service des incendies.

L'installation et l'entretien doivent être assurés par un installateur ou un service d'entretien qualifié ou par le fournisseur de gaz.

**Raypak**  
A Rheem Company

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# WARNINGS

## Pay Attention to These Terms

<b>DANGER:</b>	Indicates the presence of immediate hazards which will cause severe personal injury, death or substantial property damage if ignored.
<b>WARNING:</b>	Indicates the presence of hazards or unsafe practices which could cause severe personal injury, death or substantial property damage if ignored.
<b>CAUTION:</b>	Indicates the presence of hazards or unsafe practices which could cause minor personal injury or product or property damage if ignored.
<b>NOTE:</b>	Indicates special instructions on installation, operation, or maintenance which are important but not related to personal injury hazards.

**DANGER:** Make sure the gas on which the boiler will operate is the same type as that specified on the boiler rating plate.

**WARNING:** Do not use this boiler if any part has been under water. Immediately call a qualified service technician to inspect the boiler and to replace any part of the control system and any gas control which has been under water.

**WARNING:** To minimize the possibility of improper operation, serious personal injury, fire, or damage to the boiler:

- Always keep the area around the boiler free of combustible materials, gasoline, and other flammable liquids and vapors.
- Boiler should never be covered or have any blockage to the flow of fresh air to the heater.

**WARNING:** Risk of electrical shock. More than one disconnect switch may be required to de-energize the equipment before servicing.

**WARNING:** Should overheating occur or the gas supply fail to shut off, do not turn off or disconnect the electrical supply to the pump. Instead, shut off the gas supply at a location external to the appliance.

**AVERTISSEMENT:** En cas de surchauffe ou si l'admission de gaz ne peut être coupée, ne pas couper ni débrancher l'alimentation électrique de la pompe. Fermer plutôt le robinet d'admission de gaz à l'extérieur de l'appareil.

**WARNING - CALIFORNIA PROPOSITION 65:** This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

**WARNING:** Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury, exposure to hazardous materials\* or loss of life. Review the information in this manual carefully. \*This unit contains materials that have been identified as carcinogenic, or possibly carcinogenic, to humans.

**CAUTION:** Operation of this boiler in low temperature systems requires special piping. Harmful internal condensation will occur if the inlet water temperature does not exceed 120°F. Warranty claims will be denied when condensation occurs.

**CAUTION:** If this boiler is to be installed above radiation level, it must be provided with a low water cut-off device at the time of boiler installation.

**CAUTION:** This boiler requires forced water circulation when the burner is operating. See minimum and maximum flow rates. Severe damage will occur if the boiler is operated without proper water flow circulation.

**CAUTION:** If this boiler is to be installed in a negative or positive pressure equipment room, there are special installation requirements. Consult factory for details.

**NOTE:** This manual should be maintained in legible condition and kept adjacent to the boiler or in another safe place for future reference.

## 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 an 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.

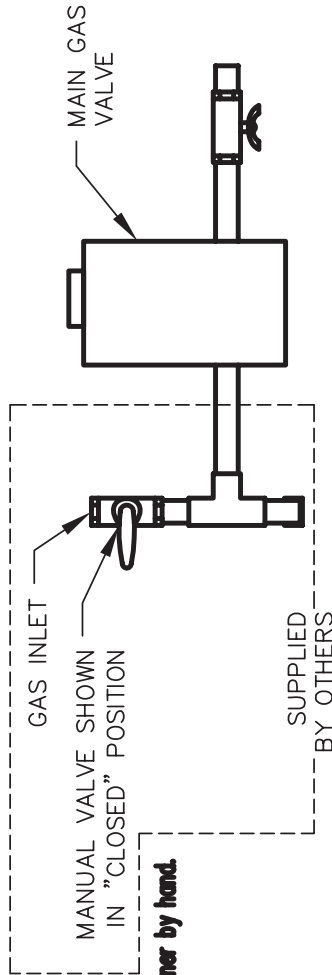
### WHAT TO DO IF YOU SMELL GAS—

- \* 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 gas supplier's instructions.

- \* If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to push in or move the gas control lever. Never use tools. If the lever will not push in or move by hand, don't 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 on this label.
2. Turn off all electric power to the appliance.
3. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
4. Turn manual valve clockwise  to "CLOSED" position.
5. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, **STOP!** Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
6. Turn manual valve counter clockwise  to "OPEN" position.
7. Turn on all electric power to the appliance.



8. If the appliance will not operate, follow the instructions below "To Turn Off Gas To Appliance" and call your service technician or gas supplier.

## TO TURN OFF GAS TO APPLIANCE

1. Turn off all electric power to the appliance if service is to be performed.
2. Turn manual valve clockwise  to "CLOSED" position.

P/N 901810 REV 1

## POUR VOTRE SÉCURITÉ LISEZ AVANT DE METTRE EN MARCHÉ

**AVERTISSEMENT:** Quiconque ne respecte pas à la lettre les instructions dans la présente notice risque de déclencher un incendie ou une explosion entraînant des dommages, des blessures ou la mort.

- A. Cet appareil ne comporte pas de veilleuse. Il est muni d'un dispositif d'allumage qui allume automatiquement le brûleur. Ne tentez pas d'allumer le brûleur manuellement.
  - B. AVANT DE FAIRE FONCTIONNER, reniflez tout autour de l'appareil pour déceler une odeur de gaz. Reniflez près du plancher, car certains gaz sont plus lourds que l'air et peuvent s'accumuler au niveau du sol.
- QUE FAIRE SI VOUS SENTEZ UNE ODEUR DE GAZ:**
- Ne pas tenter d'allumer d'appareil.
- Ne touchez à aucun interrupteur; ne pas vous servir des téléphones se trouvant dans le bâtiment.
  - Appelez immédiatement votre fournisseur de gaz depuis un voisin. Suivez les instructions du fournisseur.
  - Si vous ne pouvez rejoindre le fournisseur, appelez le service des incendies.
- C. Ne poussez ou tournez la manette d'admission du gaz qu'à la main; ne jamais utiliser d'outil. Si la manette reste coincée, ne pas tente de la réparer; appelez un technicien qualifié. Le fait de forcer la manette ou de la réparer peut déclencher une explosion ou un incendie.
  - D. N'utilisez pas cet appareil s'il a été plongé dans l'eau, même partiellement. Faites inspecter l'appareil par un technicien qualifié et remplacez toute partie du système de contrôle et toute commande qui ont été plongés dans l'eau.

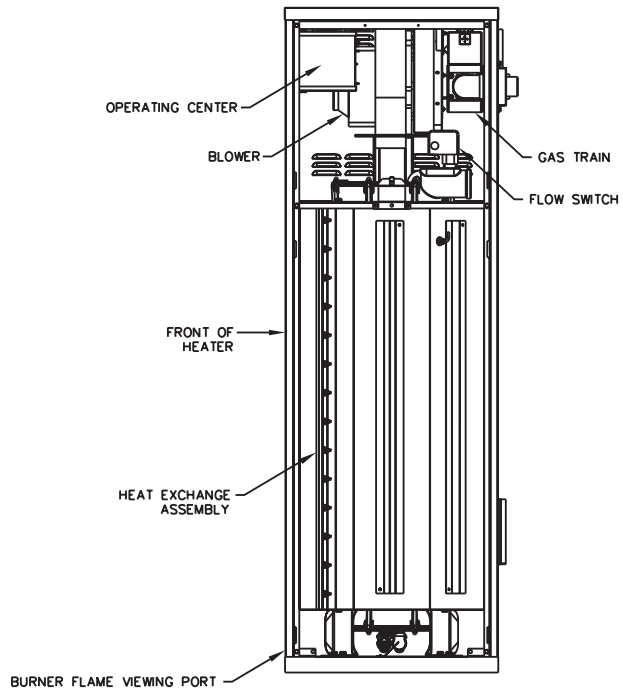
## INSTRUCTIONS DE MISE EN MARCHÉ

1. ARRÊTEZ! Lisez les instructions de sécurité sur la portion supérieure de cette étiquette.
2. Réglez le thermostat à la température la plus basse.
3. Coupez l'alimentation électrique de l'appareil.
4. Cet appareil ne comporte pas de veilleuse. Il est muni d'un dispositif d'allumage qui allume automatiquement le brûleur. Ne tentez pas d'allumer le brûleur manuellement.
5. Enlever le panneau de porte du réchauffeur.
6. Enfoncer légèrement le bouton de commande de gaz et le tourner dans le sens horaire à la position (Off).
7. Attendre cinq (5) minutes pour laisser échapper tout le gaz. Reniflez tout autour de l'appareil, y compris près du plancher, pour déceler une odeur de gaz. Si vous sentez une odeur de gaz, ARRÊTEZ! Pas-sez à l'étape B des instructions de sécurité sur la portion supérieure de cette étiquette. S'il n'y a pas d'odeur de gaz, passer à l'étape suivante.
8. Tourner le bouton de commande de gaz dans le sens antihoraire à la position (ON).
9. Reposer le panneau de porte du réchauffeur.
10. Rétablir toutes les alimentations électriques de l'appareil.
11. Réglez le thermostat à la température désirée.
12. Si l'appareil ne se met pas en marche, suivre les instructions intitulées "Comment couper l'admission de gaz de l'appareil" et appelez un technicien qualifié ou le fournisseur de gaz.

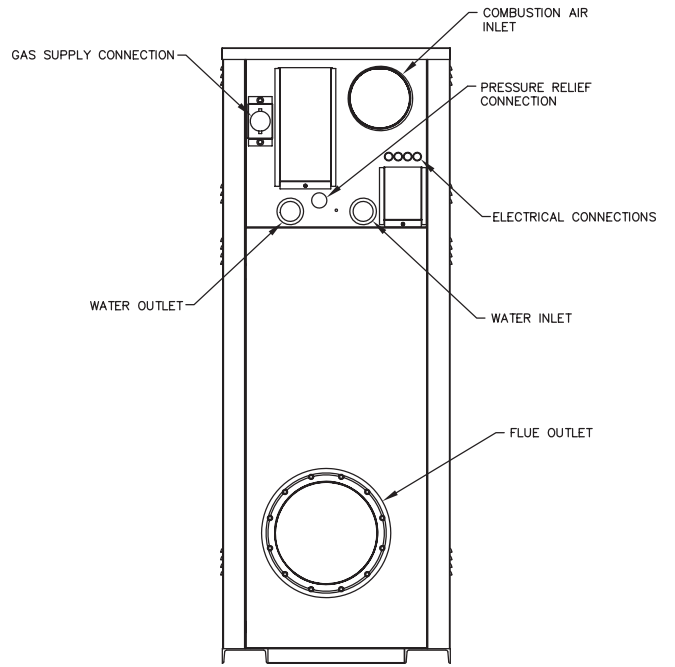
## COMMENT COUPER L'ADMISSION DE GAZ DE L'APPAREIL

1. Réglez le thermostat à la température la plus basse.
2. Coupez l'alimentation électrique de l'appareil s'il faut procéder à l'entretien.
3. Enlever le panneau de porte du chauffe-eau.
4. Tourner le bouton de commande de gaz dans le sens horaire à la position (OFF). S'assurer que le bouton reste contre l'arrêt.
5. Replacer le panneau de porte du chauffe-eau.

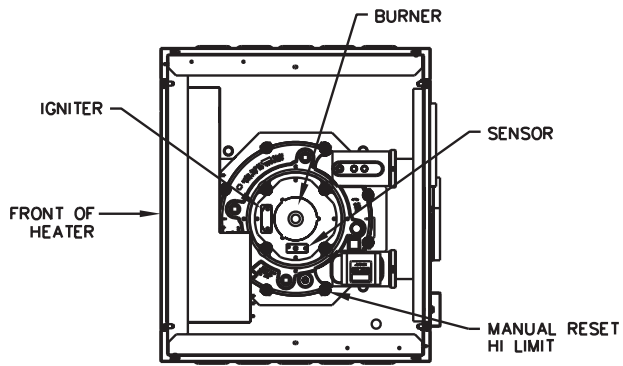
# Component Locations



Panels omitted for clarity  
**Fig. 1: Component Locations – Side**



**Fig. 3: Component Locations – Rear**



Top panel, blower and gas train omitted for clarity  
**Fig. 2: Component Locations – Top**

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# MAINTENANCE

## Suggested Minimum Maintenance Schedule

Regular service by a qualified service agency and maintenance must be performed to ensure maximum operating efficiency.

Maintenance as outlined below may be performed by the owner.

### Daily

1. Check that the area where the heater is installed is free from combustible materials, gasoline, and other flammable vapors and liquids.
2. Check for and remove any obstruction to the flow of combustion or ventilation air to heater.

### Monthly

1. Check for piping leaks around pumps, mixing valves, relief valves, and other fittings. If found, repair at once. DO NOT use petroleum-based stop-leak compounds.
2. Visually inspect burner flame.
3. Visually inspect venting system for proper function, deterioration or leakage.
4. Visually inspect for proper operation of the condensate drain in the venting. If leaks are observed repair at once.
5. Check air vents for leakage.

### Yearly (Beginning Of Each Heating Season)

**WARNING:** Annual service should ONLY be performed by a qualified service agency. Schedule annual service by calling a qualified service agency.

1. Visually check top of vent for soot. Call service person to clean. Some sediment at bottom of vent is normal.
2. Visually inspect all flue product carrying areas of the boiler including the venting system and pilot and main burners for proper function, deterioration

or leakage. Ensure that condensate drains are inspected and ensure that condensate is being directed to appropriate condensate management system or drain, as required by local codes.

3. Check that area is free from combustible materials, gasoline, and other flammable vapors and liquids.
4. Check for and remove any obstruction to the flow of combustion or ventilation air to heater.
5. Follow pre-start-up check in the Start-up section.
6. Visually inspect burner flame. It should be light blue at full input. Remove and visually inspect hot surface igniter and sensor for damage, cracking or debris build-up.
7. Check operation of safety devices. Refer to manufacturers' instructions.
8. Follow oil-lubricating instructions on pump (if required). Over-oiling will damage pump. Water-lubricated circulators do not need oiling.
9. To avoid potential of severe burn, DO NOT REST HANDS ON OR GRASP PIPES. Use a light touch; return piping will heat up quickly.
10. Check blower and blower motor.
11. Check for piping leaks around pumps, relief valves and other fittings. Repair, if found. DO NOT use petroleum-based stop-leak.

### Periodically

1. Check relief valve. Refer to manufacturer's instructions on valve.
2. Test low water cut-off (if equipped). Refer to manufacturer's instructions.

## Preventive Maintenance Schedule

**WARNING:** Preventative maintenance should ONLY be performed by a qualified service agency in accordance with the procedures listed in the heater Installation and Operating Instruction Manual.

The following procedures are recommended and are good practice for all MVB installations.

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## Daily

1. Check gauges, monitors and indicators.
2. Check instrument and equipment settings.
3. Check burner flame. (Should see light blue flame at full input rate).

## Weekly

For low-pressure heaters, test low-water cut-off device. (With heater in pre-purge, depress the low water cut-off test button. Appliance should shut-off and ignition fault light should come on. Depress reset button on front of heater control panel to reset).

## Monthly

1. Check flue, vent, stack, or outlet dampers.
2. Test blower air pressure.
3. Test high and low gas pressure interlocks (if equipped).

## Semi-Annually

1. Recalibrate all indicating and recording gauges.
2. Check flame failure detection system components.
3. Check firing rate control by checking the manifold pressure at full fire.
4. Check piping and wiring of all interlocks and shut-off valves.

## Annually

1. Test flame failure detection system.
2. Test high limit and operating temperature.
3. Check flame sensor.
4. Conduct a combustion test at full fire. Carbon dioxide should be 8.0 to 9.0% at full fire for natural gas, and between 9.0 to 10.0% for propane gas. Carbon monoxide should be < 100 ppm.
5. Check valve coil for 60 cycle hum or buzz. Check for leaks at all valve fittings using a soapy water solution (while heater is operating). Test other

operating parts of all safety shut-off and control valves and increase or decrease settings (depending on the type of control) until the safety circuit opens. Reset to original setting after each device is tested.

6. Perform leakage test on gas valves.
7. Test air switch in accordance with manufacturer's instructions. (Turn panel switch to the "On" position until blower is proven, then turn the switch to "Off.")
8. Inspect and clean burner using shop air. Air must be directed from outside of burner towards inside.

## As Required

1. Recondition or replace low water cut-off device (if equipped).
2. Check drip leg and gas strainers.
3. Check flame failure detection system.
4. Check igniter. (Resistance reading should be 42-70 ohms at ambient temperature).
5. Check flame signal strength. (Flame signal should be greater than 1 microampere DC as measured at the 2 pins on the upper left corner of the ignition control).
6. Check firing rate control by checking the manifold pressure at full fire.
7. Test safety/safety relief valves in accordance with ASME Heater and Pressure Vessel Code Section IV.



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