Rinnai RH180 Hybrid Tank – Tankless Water Heater Installation Fundamentals, Level II
CRC – Consumer Response Center – general calls, consumer questions, etc.
Available from 8 a.m. to 8 p.m. EST, Monday – Friday.

Parts Department – parts orders.
Available from 8 a.m. to 8 p.m. EST, Monday – Friday.

Warranty Department – warranty claim issues.
Available from 8 a.m. to 5 p.m. EST, Monday- Friday.

Technical Support Department – technical issues related to the function and repair of all Rinnai products.
Available in the office from 8 a.m. to 8 p.m. EST, Monday – Friday AND 24/7/365 on call support for technicians who are at the service location. Technicians only, call 1-888-RINNAIS (888-746-6247)

Engineering / Applications Department – calls related to product use and applications including sizing.
Available from 8 a.m. to 5 p.m. EST, Monday - Friday.

Rinnai America also provides the following websites for support:
- www.rinnai.us – for installation manuals, product specifications and supporting documents. More technical information is available in the “For Professionals” section of the site under “Partner Portal”. Registration is required for access to this portion of the website.
- www.trainingevents.rinnai.us – for registration in Rinnai product training classes and videos (live and online classes). Service and installation manuals and other technical documents are available under the “Resources” section of the site.
RH180 Hybrid Tank-Tankless Water Heater

Level II Training Program
Installation Fundamentals
Combining Technologies:

With the combination of a tank and a Rinnai tankless water heater into one appliance, the RH180 hybrid provides increased hot water capacity with the ease of a tank installation.
Product Component Identification

- ¾ hot water feed into building
- 4” B-vent exhaust connection
- Combustion air inlet and filter
- Tankless water heater engine
- Temperature controller
- Circulation pump for tank/engine
- Tank drain valve
- Pressure relief valve
- ¾” cold water supply into tank
- 40 gallon storage tank
- 120 Volt power cord (not shown)
- Gas connection
- Hot water supply from engine to tank
- Cold water supply from tank to engine
RH180
Sequence of Operation
Sequence of operation:

1. When the water temperature at the bottom of the tank (at the tank thermistor) drops to a pre-determined temperature, the startup sequence will begin.

2. The tankless engine’s combustion fan will begin turning, drawing fresh air from the space. This will allow the flammable vapor sensor to ensure the intake air is free of combustible vapors.

3. The pump will begin circulating water through the tank-tankless loop.

4. The engine will fire when it detects the water flow from the pump.

5. The heated water from the engine will be deposited back into the tank. The water will be directed toward the top of the tank close to where hot water is being drawn into the plumbing system.

6. Initially as water is drawn from the tank into the engine, the Delta T will be fairly large and the engine will operate in a high fire mode.

7. As the water at the bottom of the tank begins to heat, warmer water will then begin to enter the engine — this will reduce the Delta T allowing a higher flow rate through the engine.

8. As the water in the tank continues to warm and gets closer to the set temperature, the tankless engine will automatically reduce its gas input.

9. When the temperature at the bottom of the tank reaches the set point, the pump turns off — the tankless engine will go into a standby mode until the next start sequence.
RH180
Water Heater
Sizing
## RH180 Sizing

<table>
<thead>
<tr>
<th>Water Heating Options</th>
<th>Max input (Btuh / Kwh)</th>
<th>Tank Capacity (gal.)</th>
<th>Time of available hot water (min.) 70⁰ temp rise</th>
<th>Time of available hot water (min.) 70⁰ temp rise</th>
<th>Recovery time (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showers In use at one time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Tank</td>
<td>4.5 Kw</td>
<td>40</td>
<td>21</td>
<td>10</td>
<td>88</td>
</tr>
<tr>
<td>Gas Tank</td>
<td>34,000 Btu</td>
<td>40</td>
<td>18</td>
<td>8</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>40,000 Btu</td>
<td>50</td>
<td>26</td>
<td>11</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>75,000 Btu</td>
<td>75</td>
<td>50</td>
<td>19</td>
<td>32</td>
</tr>
<tr>
<td>Rinnai RH180 Hybrid Tank - Tankless</td>
<td>91,300 Btu</td>
<td>40</td>
<td>Continuous</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Rinnai Tankless</td>
<td>Up to 199,000 Btu</td>
<td>N/A</td>
<td>Continuous</td>
<td>Continuous</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- Data is based on a 50°F inlet water temperature and a 120°F hot water set point (70°F rise).
- Shower heads assumed to be 2.5 gpm mixed flow rate with 105°F at the fixture.
- Available hot water time and recovery time based on industry standard calculation methods and Rinnai lab testing. Actual results may vary based on the application.
RH180

Product Features & Safety devices
Product Features

- 180 gallon First Hour Rating.
- Quick recovery: Approximately 16 minutes starting from a cold tank.
- Thermal Efficiency: 80%.
- Temperature controller: 5 temperature settings.
- Maintenance/diagnostic codes: Error codes displayed if a fault is detected.
- 40 gallon storage tank: Two inches of insulation, no heating element, burner, or vent stack which helps to minimize standby heat loss.
- Direct electronic ignition: No standing pilot.
- Blue-zircon-glass coated tank.
- Uses standard 4” B-Vent.
- Can be common vented with a furnace.
- Piping configuration and connections same as standard tanks.
- 1/2” gas line connection.
- Water is heated in the engine not the tank: Less thermal stress on the tank.
- Circulation system compatible.
Safety Devices

- Flame rod: Detects when flame is present or is extinguished.
- Overheat bi-metal sensor: Detects overheated water conditions.
- Boiling protection sensor: Monitors heat exchanger water temperature.
- Heat exchanger thermal fuse: Detects heat exchanger overheat condition.
- Burner/combustion fan sensor: Indicates if there is a blocked flue.
- Flammable vapor sensor: Monitors for flammable vapors in intake air supply.
- CO sensor: Monitors exhaust gasses for poor combustion, (NOTE: not a room CO sensor).
- Built in surge protector.
- Power supply is protected by 5-amp glass fuse.
- Main circuit board monitors component operation and will post error codes or maintenance codes on the temperature controller if abnormal operation is detected.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>RH180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min / Max Gas Input Rates</td>
<td>Min. 59,500 Btu-Natural Gas / 47,600 Btu-Propane</td>
</tr>
<tr>
<td></td>
<td>Max. 91,300 Btu-Natural Gas / 87,300 Btu-Propane</td>
</tr>
<tr>
<td></td>
<td>(two stage burner, does not modulate between max-min inputs)</td>
</tr>
<tr>
<td>First Hour Rating</td>
<td>180 Gallons / hour</td>
</tr>
<tr>
<td>Storage Tank Volume</td>
<td>40 gallons</td>
</tr>
<tr>
<td>Temperature Selections</td>
<td>110°F, 120°F, 130°F, 135°F, 140°F (43°C, 49°C, 54°C, 57°C, 60°C )</td>
</tr>
<tr>
<td>Weight</td>
<td>150 lbs. (68kg)</td>
</tr>
<tr>
<td>Thermal Efficiency</td>
<td>80%</td>
</tr>
<tr>
<td>Noise Level</td>
<td>50 dB</td>
</tr>
<tr>
<td>Electrical</td>
<td>120 VAC, 60 Hz., Normal Operation - 150 watts / Standby – 3 watts (5 amp fuse)</td>
</tr>
<tr>
<td>Minimum Gas Supply Pressure</td>
<td>4.0” w.c. Natural Gas / 8.0” w.c. Propane</td>
</tr>
<tr>
<td>Maximum Gas Supply Pressure</td>
<td>10.5” w.c. Natural Gas / 13.5” w.c. Propane</td>
</tr>
<tr>
<td>Connections</td>
<td>Gas Supply: ½” MNPT – Water Connections: ¾” MNPT</td>
</tr>
<tr>
<td>Water Supply Pressure</td>
<td>20 - 150 psi (Recommend 30 – 50 psi for maximum performance)</td>
</tr>
<tr>
<td>Sensor and Switches</td>
<td>Flammable Vapor, Combustion Air CO Sensor, Bi-Metal Overheat Switch</td>
</tr>
</tbody>
</table>

See Operation / Installation manual for more complete information. Specifications subject to change without prior notice.
A licensed professional must install the appliance, inspect it and leak test it before use. The warranty may be voided due to improper installation.

The installer should have skills such as:

- Gas sizing
- Connecting gas lines, water lines, valves and electricity.
- Knowledge of applicable national, state and local codes.
- Installing venting through a wall or roof.
- Venting Category I, Fan Assist Appliances per NFPA 54 and local codes.

If you lack these skills contact a licensed professional.
Installation Location

- Not approved for mobile homes or outdoor installations (can be used in light commercial applications where the temperature requirement do not exceed 140° F).
- Installation must be accomplished in such a manner that if the tank or any connection should leak, the flow of water will not cause damage to the structure. For this reason it is not advisable to install the water heater in an attic or upper floor. When such location cannot be avoided, an approved drain pan should be used and piped to a drain line or outside the home.
- Use an approved tank water heater drain pan. (Rinnai recommends 26” diameter pan. See next page for example). See International plumbing code for details.
- Gasoline or other flammable substances MUST NOT be stored in the vicinity of the water heater.
- A stand is not required as this water heater complies with the FVIR requirements and the burner and igniter are positioned greater than 18 inches from the base of the unit (verify with local codes).
- If installed in a crawl space with a dirt floor, position the unit on a solid level surface (such as concrete) away from the ground’s moisture.
- If installed in a closet or alcove, ensure all intake (combustion) air requirements are followed, see owner’s/installation manual.
- The RH180 meets or exceeds the National Appliance Energy Conservation Act Standards with respect to insulation and standby losses. If an insulation blanket is still desired, follow the installation procedures outlined in the Operation and Installation manual.
Drain Pan Installation.

Rinnai recommends using a 26” diameter drain pan minimum to provide protection from leaks and still allow removal of the front pipe/pump shroud for service. Use only an approved drain pan and install in accordance with all applicable plumbing and building codes.
Installation Location

**Minimum Clearances:**
The minimum clearances from both combustibles and non-combustibles construction is:

- 0 inches from the sides.
- 0 inches from the back.
- 12 inches from the top.
- 4 inches from the front.

**NOTE:** These clearances are minimums. Be sure to allow sufficient clearance for future servicing and maintenance.
Dimensions

23.8 (605)

18.7 (475)

24.8 (630)

25.8 (655)

27.5 (698)

51.2 (1300)

8 (203)

10 (254)

48.6 (1234)

27.5 (698)

Rinnai
Electrical and Water Installation

Code Adherence
- Installation MUST comply with National, State, and Local codes.

Electrical Requirements
- Standard three-prong 120 VAC, 60 Hz. grounded circuit.
- Ensure plumbing lines are grounded in accordance to Local, State, and National codes.

Water Installation Requirements
- Supply pressure 20 – 150 psi.
- A temperature/pressure relief valve is supplied with the product. The discharge must be piped per local code requirements.
- Water quality should meet Part 143 of the National Secondary Drinking Water Regulations. (see installation manual for guidelines).
- Ensure inlet water filter on appliance is clean before filling tank.
- Do not operate water heater unless tank is completely full of water.
Water Requirements (continued)

- Make sure the water heater and its water lines are protected from freezing. Damage due to freezing is not covered by the warranty.

- Do not use this appliance in an application such as a pool or spa heater that uses chemically treated water. (the RH180 is suitable for filling large or whirlpool spa tubs using potable water).

- If a water heater is installed in a closed water supply system, such as one having a backflow preventer, a means shall be provided to control thermal expansion (expansion tank).

- If required, install a vacuum relief valve per local codes. (Massachusetts 248 CMR section 10.14 (I) “All potable water pressure tanks shall be provided with a vacuum relief valve at the top of the tank that will operate up to a maximum water pressure of 200 P.S.I.G. and to a maximum water temperature of 200° F.”)
RH180

Venting

and

Altitude Requirements

! WARNING

Improper installation of the vent system and its components, or failure to follow all installation instructions, can result in property damage or serious injury
Vent Guidelines: Combustion air

Combustion air is drawn from the room in which the water heater is installed. This water heater requires adequate combustion air for ventilation and dilution of flue gasses. Failure to provide adequate combustion air can result in unit failure, fire, explosion, serious bodily injury or death. Read all the venting guidelines in the Operation and Installation manual.

**Note:** Combustion air must be free of corrosive chemicals. Do not provide combustion air from corrosive environments. Appliance failure due to corrosive air is not covered by the warranty.

- Combustion air must be free of acid forming chemicals such as sulfur, fluorine and chlorine. These chemicals have been found to cause rapid damage/decay and could become toxic when drawn into the combustion chamber of the appliance.
- Such chemicals can be found in, but not limited to bleach, ammonia, cat litter, aerosol sprays, cleaning solvents, varnish, paint, and air fresheners.
- Do not store any of the products listed above in the vicinity of this water heater.

The room in which the water heater is installed must be defined as a confined or unconfined space based on the code requirements pertaining to Category 1 type appliances.
**Unconfined space:**
An unconfined space is defined in NFPA 54 as “a space whose volume is not less than 50 cubic feet per 1,000 Btu/hr. (4.8 m$^3$ per kW per hour) of the aggregate input rating of all appliances in that space. Rooms communicating directly with the space in which the appliances are installed, through openings not furnished with doors, are considered a part of the unconfined space”. If the “unconfined space” containing the appliance(s) is in a building with tight construction, additional outside air may be required for proper operation. Outside air openings should be sized the same as for a confined space.

**Confined space:**
(Small room, Closet, Alcove, Utility Room, Etc.)
A confined space is defined in the NFPA 54 as “a space whose volume is less than 50 cubic feet per 1000 Btu/hr. (4.8 m$^3$ per kW per hour) of the aggregate input rating of all appliances installed in that space”. 

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Confined and Unconfined space examples:

**Unconfined** space with a 91,300 Btu water heater.

25 x 25 x 8 = 5000 cubic feet
5000 cubic feet ÷ 50 = 100
100 x 1000 = 100,000 Btu

**Confined** space with 91,300 Btu water heater and a 100,000 btu furnace. Total = 191,300 Btu.

Vent Guidelines: Combustion air

24
A confined space must have two combustion air openings. Size the combustion air openings based on the Btu input for all gas utilizing equipment in the space and the method by which combustion air is supplied.

**Louvers and Grills:**
When sizing the permanent opening:
Consideration must be taken for the design of the louvers or grills to maintain the required free area required for all gas utilizing equipment in the space. If the free area of the louver or grill is not available, assume wood louvers will have 25% free area and metal louvers / grills will have 75% free area. Under no circumstance should the louver, grill or screen have openings smaller than \( \frac{1}{4} \)".

Example:
Wood: \( 10 \text{ inches} \times 12 \text{ inches} \times 0.25 = 30 \text{ square inches of free space.} \)
Metal: \( 10 \text{ inches} \times 12 \text{ inches} \times 0.75 = 90 \text{ square inches of free space.} \)

Combustion air provided to the appliance should not be taken from an area of the structure that may produce a negative pressure (i.e. exhaust fans, powered ventilation fans).
Using Indoor Air For Combustion:
When using air from other room(s) in the building, the total volume of the room(s) must be of adequate volume (Greater than 50 cubic feet per 1,000 Btu/hr.). Each combustion air opening must have at least one square inch of free area for each 1,000 Btu/hr, but not less than 100 square inches each.
Using Outdoor Air For Combustion:
Outdoor air can be provided to a confined space through two permanent openings, one commencing within 12 inch (300 mm) of the top and one commencing within 12 inches (300 mm) of the bottom, of the confined space. The openings shall communicate to the outside by one of two ways.
When communicating directly with outdoors through horizontal ducts, each opening shall have a minimum free area of 1 square inch per 2000 Btu/hr (1100 mm\(^2\)/kW) of total input rating of all appliances in the confined space.

Note: If ducts are used, the cross sectional area of the duct must be greater than or equal to the required free area of the openings to which they are connected.

When communicating indirectly with the outdoors through vertical ducts, each opening shall have a minimum free area of 1 square inch/4,000 Btu/hr (550 mm\(^2\)/kW) of total input rating of all appliances in the confined space.

Combustion air to the appliance can be provided from a well ventilated attic or crawl space.

Note: Check your local building codes to ensure providing makeup air in the manner you choose is allowed.
Vent Guidelines: Exhaust

• This water heater must be vented/terminated vertically to the outside of the building or structure. This water heater is NOT designed or certified for side wall horizontal vent terminations.

• All installations must be vented in accordance with the National Fuel Gas Code NFPA 54/ANSI Z223.1 – latest edition and the requirements of State or local codes. In Canada, the furnaces must be vented in accordance with National Standard of Canada, CAN/CSA B149.2 – latest editions and amendments and the codes of the local utility or other authority having jurisdiction.

• NOTE: The vertical height of the Category I venting system must be at least as great as the horizontal length of the venting system.

• All vent (Category I) passing through a concealed space, an attic or floor, MUST be Type B double wall vent and/or Type B double wall vent connectors. For vent passing through an internal wall, use Type B with ventilated thimble ONLY.

• The RH180 CANNOT be vented into any chimney serving an open fireplace or any other solid fuel burning appliance.

• Use the same diameter Category I connector or vent as permitted by NFPA 54/ANSI z223.1 venting tables.
Vent Guidelines: Exhaust

- It is not permitted to reduce vent diameter (4").
- Vent or vent connector runs should be as short and direct as possible.
- Vertical outdoor runs of Type B or ANY single wall vent below the roof line are NOT permitted.
- All horizontal vent runs to be sloped up away from the RH180 a minimum of ¼” (6mm) per foot.
- All horizontal vent runs are to be supported, at a minimum, every 6 ft. (2 m) using suitable clamps and/or metal straps.
- Existing exhaust vent or chimney is to be checked to ensure they meet clearances and local codes.
- The RH180 can ONLY be connected to a manufactured chimney or vent that complies with a recognized standard. Venting into a masonry or concrete chimney is only permitted as outlined in the NFPA54/ANSI Z223.1 National Fuel Gas Code venting tables. It is therefore a contractual obligation on the part of the installer to follow all safe venting requirements.
Vent Dampers:
Vent dampers must be certified in accordance with ANSI Z21.68.

Before installing any flue damper, consult the local gas authority and damper manufacturer for proper installation.

**WARNING**
Thermal Operated Vent Dampers: Should NOT be used with this appliance. This appliance has a thermal efficiency greater than 80%. This higher efficiency will result in lower flue gas temperatures. Such temperatures may be too low to activate a thermal operated vent damper. Use of a thermal operated flue damper on this product may result in spillage of exhaust gases and ultimately carbon monoxide poisoning.

Vent Inspection:
The entire vent system (Combustion air ducts, louvers, and exhaust vent) must be checked periodically for signs of obstruction or damage. If damaged components are observed they must be repaired or replaced immediately.

Vent Size:
This water heater is equipped with a 4” vent adaptor and must never be attached to a vent smaller than 4”. Certain applications may require vent diameters greater than 4”. Consult your local gas supplier or authority to aid in the proper vent diameter selection per the requirement of the vent tables in the current edition of the National Fuel Gas Code ANSI Z223.1/NFPA 54.
Set dip switch 3 to the position shown in the table below for your altitude. The default setting for the appliance is 0 – 2,000 ft. (0 - 610 meters) with dip switch 3 in the OFF position. The maximum allowed altitude for this appliance is 5,400 ft. (1,646 meters).

<table>
<thead>
<tr>
<th>Switch No. 3</th>
<th>0 – 2000 ft. (0- 610 m)</th>
<th>2001 – 5400 ft. (610 – 1646 m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>ON</td>
<td></td>
</tr>
</tbody>
</table>

**WARNING:** Do not adjust the other dip switches unless specifically instructed to do so.
RH180
Gas Supply Installation

When sizing a gas system you MUST take into account the type pipe and gas being used, the inlet gas pressure being fed to the site, meter, regulator and/or tank size and Btu ratings. Improperly sized gas system will result in poor performance of all gas appliances.
The RH180 has a maximum input of 91,300 Btu. Under most circumstances the same supply gas line that supplies a standard atmospheric tank water heater (40 gallons or more) will adequately supply the RH180. Consider the following:

- All gas appliances in the structure MUST be included in gas sizing calculation.
- Flexible gas supply lines connected directly to the RH180 MUST be able to supply a minimum of 91,300 Btu for NG or 87,300 Btu for LP.
- Consult the NFPA 54 National Fuel Gas Code Pipe Sizing Guidelines to ensure adequate gas supply is provided.
- Supplied gas pressure must be within the recommendations listed on the unit’s rating plate.
- The RH180 requires a higher gas supply than standard 40 gallon tank water heaters.
  - The RH180 has a maximum input rating of 91,300 Btu (natural gas models).
  - The average 40 gallon gas-fired tank water heater has an input rating of approximately 40,000 Btu.
  - In this example, the difference between the RH180 and the 40 gallon tank water heater is 51,300 Btu. This additional gas load must be considered when installing this product.

- Issues caused by insufficient gas supply:
  - Poor appliance operation or intermittent error codes.
  - Rumbling noises due to insufficient air/gas mixture.

If any symptom exists suggesting a gas supply issue may be present, a gas manometer will be needed to verify incoming pressure.
This gas supply sizing procedure is known as the longest length method. This example is for Natural gas. A full explanation of NG and LPG pipe sizing can be found in the National Fuel Gas Code Manual.

1. Using this method you first determine the total pipe length from the gas meter to the appliance farthest from the meter. (60 ft. in this example).

2. Once this length is determined find the line on the appropriate table in the NFPA 54 manual that corresponds to that length (for your pipe, type of gas, inlet pressure and specific gravity).

3. The 60 ft. measurement will be the only length used for this calculation.

<table>
<thead>
<tr>
<th>Pipe Size (in.)</th>
<th>Capacity in Cubic Feet of Gas per Hour (CFH=Btu/1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal: ½</td>
<td>10 ft. 172 60 130 368 2090 1</td>
</tr>
<tr>
<td></td>
<td>20 ft. 118 247 468 957 1430 1</td>
</tr>
<tr>
<td></td>
<td>30 ft. 95 199 378 768 1150 1</td>
</tr>
<tr>
<td></td>
<td>40 ft. 81 170 320 657 985 1</td>
</tr>
<tr>
<td></td>
<td>50 ft. 72 151 284 503 873 1</td>
</tr>
<tr>
<td></td>
<td>60 ft. 65 137 257 528 791 1</td>
</tr>
<tr>
<td></td>
<td>70 ft. 60 126 237 465 728 1</td>
</tr>
<tr>
<td></td>
<td>80 ft. 50 117 227 456 718 1</td>
</tr>
</tbody>
</table>

Outlet C RH180 91,300 Btu/hr
Outlet D furnace 100,000 Btu/hr
Outlet A gas fireplace 30,000 Btu/hr
Outlet B range/oven 75,000 Btu/hr
Outlet D furnace 100,000 Btu/hr
Outlet C RH180 91,300 Btu/hr
Outlet A gas fireplace 30,000 Btu/hr
Outlet B range/oven 75,000 Btu/hr
Gas Supply Sizing Procedure

Using the row for 60 ft on this table, you can now determine pipe sizes.

1. Outlet A, section 1, can draw up to 30,000 Btu. This section requires ½” pipe minimum.
2. Outlet B, Section 2, can draw up to 75,000 Btu. This section requires ¾” pipe minimum.
3. Outlets C and D, section 3, share a common supply pipe which can draw up to a total of 191,300 Btu. This section requires 1” pipe minimum.
4. Section 4 is supplying outlets A, C and D. These outlets can draw up to 221,300 Btu. This section requires 1” pipe minimum.
5. Section 5 is supplying all appliances. The total Btu load for the home is 296,300 Btu. This section requires 1 ¼” pipe minimum.

<table>
<thead>
<tr>
<th>Pipe Size (in.)</th>
<th>Nominal:</th>
<th>½</th>
<th>¾</th>
<th>1</th>
<th>1 ¼</th>
<th>1 ½</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (ft)</td>
<td>Capacity in Cubic Feet of Gas per Hour (CFH=Btu/1000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>65</td>
<td>137</td>
<td>257</td>
<td>528</td>
<td>791</td>
<td></td>
</tr>
</tbody>
</table>

Outlet A gas fireplace 30,000 Btu/hr
Outlet B range/oven 75,000 Btu/hr
Outlet C RH180 91,300 Btu/hr
Outlet D furnace 100,000 Btu/hr
Gas System - Two stage piping example

If resizing gas supply lines is not a feasible option, a two stage supply system may be used depending on local code guidelines. Two stage systems operate in the following manner:

- Higher pressure (usually 2 lbs or approximately 56” w.c.) is supplied for a large portion of the supply system.

- By increasing the system pressure, this overcomes volume inadequacies. NOTE: Never apply high pressure (such as 2 lbs) to a household appliance unless stated by the manufacturer. All Rinnai tankless water heaters require no more than ½” lb inlet pressure (14” w.c.).

- Regulators are placed close to each appliance to reduce pressure to the appliance standard of ½ lb or approximately 7-14” w.c.

- Follow NFPA 54 guideline and all code requirements when sizing two stage systems.

- Two stage systems can be used in NG or LP applications—sizing values differ by gas type

- Gas meter capacity must also be considered
RH180
Temperature Controller
Temperature Controller

How to use the Temperature Controller

TEMPERATURE INDICATION
Indicates the selected water temperature (note temperature key below). Diagnostic Codes flash if operator intervention is required or a warning condition is sensed.

THERMOSTAT
Increases or decreases the desired water temperature

TEMPERATURE KEY

IN USE INDICATOR
Indicates that the engine is in operation and heating water (does not indicate pump operation)

ON/OFF BUTTON
When unit is Off, freeze protection is active. If the water heater engine approaches, freezing temperatures, the pump will cycle warm water from the tank into the engine. If the tank approaches freezing temperatures, the engine will fire while the pump circulates—warming the tank water.

Note: Freeze protection will activate as long as gas and electricity are available.
Temperature Controller

Five temperature settings are available. Push the up and down arrows to select the desired temperature setting. The number on the display corresponds to the temperature scale below.

1. = 110° F
2. = 120° F
3. = 130° F
4. = 135° F
5. = 140° F

To display the recovery flow rate (in gallons per minute) through the unit (not the fixture), press and hold the UP button. After 3 seconds also press the ON/OFF button then release both buttons.

To display the temperature supplied to the storage tank in degrees Fahrenheit, press and hold the DOWN button. After 3 seconds also press the ON/OFF button then release both buttons.

(Note: the temperature display will be one or two digits, Example: 14 = 140 to 149.)
RH180
Maintenance and Warranty
Rinnai recommends that the inlet water filter be cleaned before the initial operation of a new unit.

Before removing the inlet filter, ensure that the water supply has been turned off.

If the tank is already full, it must be drained from the drain valve at the bottom of the tank.

See filter location in picture at right.

Remove any debris from the filter either by rinsing or low pressure compressed air.

When reinstalling the filter assembly, it should be hand tightened only.
The RH180 is a fan assisted water heater. Intake air is drawn into the appliance from the surrounding area.

To maintain optimum performance, periodically clean the air filter. Do not operate unit if the filter is not in place.

A dirty air filter could result in codes 05, 10 or 13 being posted on the temperature control panel. See manual for details.
Maintenance - Tank

- Drain the water from the tank at least once per year. This will remove excess sediment from the bottom of the tank. Accumulated sediment will reduce the efficiency and life expectancy of the tank.

- Manually operate the relief valve at least once per year.

- The water heater is equipped with an anode rod that is designed to prolong the life of the glass-lined tank. This anode is slowly consumed protecting the tank from corrosion. The anode should be checked every two years. If more than half of the anode has been consumed it should be replaced.

- In certain conditions, the anode rod can react with the water producing discolored water or an odor. This can be a result of the reaction between the anode and hydrogen sulfide gas dissolved in the water. For more information see the “required maintenance” section of the operation and installation manual under “Anode”.
Flushing the heat exchanger consists of pumping virgin food grade white vinegar or food grade citric acid through the copper heat exchanger to remove lime scale or calcium buildup.

Damage caused by lime or scale buildup is not covered under the water heater’s warranty.

Specific flushing instructions can be found in the System Maintenance section of the operation and installation manual.

5 gallon bucket to be filled with 4 gallons of food grade white vinegar or citric acid.
Internal view of tank

- ¾” cold feed inside tank
- ¾” anode rod inside tank
- ¾” circulation pump feed line back into tank
- Bottom pan of tank
Typical Installations.

A Hot Water Outlet
B Hot water Outlet Valve
C Temperature – Pressure Relief valve
D Cold and Hot Unions
E Cold Water Supply valve
F Cold Water Supply
G Thermal Expansion Tank
H 4” B-Vent

I Combustion Air Screen
J Operation Unit / Temperature Control
K Outlet Receptacle
L Drain Pan
M Temperature – Pressure Relief Valve Discharge Pipe (do not cap plug or reduce)
N Drip Leg (Sediment Trap)
O Gas Union
P Gas control valve
Q Thermostatic Mixing Valve
R Non-Tempered Return Line
S Non-Tempered Supply Line

* Field Supplied
Installation Method (2 units)

Pictures are for illustration Purposes only.

Parallel Piping (recommended method)

Cold water in

Hot water out

Series Piping (not allowed)

Cold water line feeds into #1 water heater

Drip pans MUST be installed under each water heater per local or State code.
## Component Description

### Parts Breakdown

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION OF ENGINE PARTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>EXHAUST DUCT BOX</td>
</tr>
<tr>
<td>3</td>
<td>OVERHEAT SWITCH</td>
</tr>
<tr>
<td>4</td>
<td>HEAT EXCHANGER</td>
</tr>
<tr>
<td>5</td>
<td>THERMAL FUSE</td>
</tr>
<tr>
<td>6</td>
<td>ELECTRODE</td>
</tr>
<tr>
<td>7</td>
<td>FLAME ROD</td>
</tr>
<tr>
<td>8</td>
<td>MANIFOLD ASSEMBLY</td>
</tr>
<tr>
<td>9</td>
<td>P.C.B.</td>
</tr>
<tr>
<td>10</td>
<td>IGNITER</td>
</tr>
<tr>
<td>11</td>
<td>SURGE PROTECTOR</td>
</tr>
<tr>
<td>12</td>
<td>GAS CONTROL ASSEMBLY</td>
</tr>
<tr>
<td>13</td>
<td>GAS CONNECTION</td>
</tr>
<tr>
<td>14</td>
<td>DRAIN VALVE</td>
</tr>
<tr>
<td>15</td>
<td>HOT WATER OUTLET</td>
</tr>
<tr>
<td>16</td>
<td>COMBUSTION FAN</td>
</tr>
<tr>
<td>17</td>
<td>WATER INLET</td>
</tr>
<tr>
<td>18</td>
<td>WATER FILTER ASSEMBLY</td>
</tr>
<tr>
<td>19</td>
<td>WATER FLOW SENSOR</td>
</tr>
<tr>
<td>20</td>
<td>WATER FLOW CONTROL DEVICE</td>
</tr>
<tr>
<td>21</td>
<td>OPERATION UNIT</td>
</tr>
<tr>
<td>22</td>
<td>COMBUSTION AIR ASSEMBLY</td>
</tr>
<tr>
<td>23</td>
<td>FLAMMABLE VAPOUR ASSEMBLY</td>
</tr>
<tr>
<td>24</td>
<td>BURNER THERMISTOR</td>
</tr>
<tr>
<td>25</td>
<td>COMBUSTION CHAMBER FRONT PLATE ASSEMBLY</td>
</tr>
<tr>
<td>26</td>
<td>OUTGOING WATER THERMISTOR</td>
</tr>
<tr>
<td>27</td>
<td>WALL INSTALLATION BRACKET</td>
</tr>
<tr>
<td>28</td>
<td>CO SENSOR</td>
</tr>
<tr>
<td>29</td>
<td>EXHAUST OUTLET ASSEMBLY</td>
</tr>
<tr>
<td>30</td>
<td>FRONT PANEL ASSEMBLY</td>
</tr>
<tr>
<td>31</td>
<td>MAIN BURNER</td>
</tr>
</tbody>
</table>

*Diagram of the engine parts is also provided.*
Component Description

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ENGINE</td>
</tr>
<tr>
<td>2</td>
<td>PUMP</td>
</tr>
<tr>
<td>3</td>
<td>RELIEF VALVE</td>
</tr>
<tr>
<td>4</td>
<td>ANODE</td>
</tr>
<tr>
<td>5</td>
<td>J-TUBE</td>
</tr>
<tr>
<td>6</td>
<td>DIPTUBE</td>
</tr>
<tr>
<td>7</td>
<td>OUTLET NIPPLE</td>
</tr>
<tr>
<td>8</td>
<td>DRAIN VALVE</td>
</tr>
<tr>
<td>9</td>
<td>THERMOSTAT BRACKET</td>
</tr>
<tr>
<td>10</td>
<td>THERMOSTAT BRACKET</td>
</tr>
<tr>
<td>11</td>
<td>FLEXIBLE HOSE</td>
</tr>
<tr>
<td>12</td>
<td>FLEXIBLE HOSE</td>
</tr>
<tr>
<td>13</td>
<td>FRONT COVER</td>
</tr>
<tr>
<td>14</td>
<td>SIDE TRIM</td>
</tr>
<tr>
<td>15</td>
<td>THERMISTOR</td>
</tr>
<tr>
<td>16</td>
<td>SHOE-HORSE GROMMET</td>
</tr>
<tr>
<td>17</td>
<td>NIPPLE 1/2” X 4”</td>
</tr>
<tr>
<td>18</td>
<td>90 ELBOW</td>
</tr>
<tr>
<td>19</td>
<td>HEXAGONAL REDUCING BUSHING</td>
</tr>
<tr>
<td>20</td>
<td>CLOSE NIPPLE</td>
</tr>
</tbody>
</table>
Maintenance Codes

Maintenance codes flash on the temperature controller when a fault occurs. Depending on the code, water flow or power may need to be reset to clear the code. See owner's manual for a full detailed list of all codes.

**Diagnostic Codes and Remedies**

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>Air Filter Error.</td>
<td>Follow the procedure “Air Screen Inspection, Detection and Cleaning” in the operation / installation manual. If the error code continues to flash after cleaning the air filter, review the items under “Code 10” or contact a qualified service technician. NOTE: This code will allow the water heater to continue operating.</td>
</tr>
<tr>
<td>07</td>
<td>Circulation flow rate has dropped below 2.1 GPM.</td>
<td>Check the water filter for blockage. Check pump operation and wiring. Clean heat exchanger. NOTE: This code will allow the water heater to continue operating.</td>
</tr>
<tr>
<td>10</td>
<td>Air supply or exhaust blockage.</td>
<td>Check that nothing is blocking the vent, inlet screen or “Combustion Air Assembly”. Check all vent components for proper connection.</td>
</tr>
<tr>
<td>Code</td>
<td>Definition</td>
<td>Remedy</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>10 cont.</td>
<td>Air supply or exhaust blockage.</td>
<td><strong>Licensed professional only</strong>&lt;br&gt;Ensure listed 4” B-vent material is used and there are no reductions in the vent system.&lt;br&gt;Check fan for blockage.&lt;br&gt;Ensure vent length, vent size and combustion air comply with the requirements stated in the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1.</td>
</tr>
<tr>
<td>11</td>
<td>No Ignition.</td>
<td>Check that the gas is turned on at the water heater, gas meter, or cylinder.&lt;br&gt;Ensure the appliance is properly grounded.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Licensed professional only</strong>&lt;br&gt;Ensure gas type and pressure is correct.&lt;br&gt;Ensure gas line, meter, and/or regulator is sized properly.&lt;br&gt;Bleed all air from the gas line.&lt;br&gt;Verify dip switches are set properly.&lt;br&gt;Ensure igniter is operational. (check igniter wiring harness for damage.)&lt;br&gt;Check gas solenoid valves for open or short circuits.&lt;br&gt;Remove burner cover and ensure all burners are properly seated.&lt;br&gt;Remove burner plate and inspect burner surface for condensation or debris.</td>
</tr>
<tr>
<td>12</td>
<td>No Flame.</td>
<td>Check that the gas is turned on at the water heater, gas meter or cylinder.&lt;br&gt;Check for obstructions in the flue outlet.&lt;br&gt;Ensure the appliance is properly grounded.</td>
</tr>
<tr>
<td>Code</td>
<td>Definition</td>
<td>Remedy</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>--------</td>
</tr>
</tbody>
</table>
| 12 cont. | No Flame. | Licensed professional only  
Ensure gas line, meter, and/or regulator is sized properly.  
Ensure gas type and pressure is correct.  
Bleed air from the gas lines.  
Ensure vent length, vent size and combustion air comply with the requirements stated in the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1.  
Verify dip switches are set properly.  
Check power supply for loose connections.  
Check power supply for proper voltage and voltage drops.  
Ensure flame rod wire is connected.  
Check flame rod for carbon buildup.  
Disconnect and reconnect all wiring harnesses on unit and PC Board.  
Check for DC shorts at components.  
Check gas solenoid valves for open or short circuits.  
Remove burner plate and inspect burner surface for condensation or debris. |
| 13 | Combustion. | Review items listed under codes “05” and “10”. |
## Maintenance Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>FE Cont.</td>
<td>Flammable Vapors Detected.</td>
<td>When safety personnel have identified the area as safe and all flammable vapors have been removed and eliminated, the water heater can be reset by unplugging the unit and then plugging back in. If “FE” continues to flash after the area is determined to be free from flammable vapors, contact a qualified service technician.</td>
</tr>
<tr>
<td>14</td>
<td>Thermal Fuse.</td>
<td>Check for restrictions in air flow around the unit and vent termination.</td>
</tr>
<tr>
<td></td>
<td><strong>Licensed professional only</strong></td>
<td>Check gas type of unit and ensure it matches the gas type being used. Ensure dip switches are set to the proper position. Check heat exchanger for cracks and/or separations. Check heat exchanger surface for hot spots which indicate blockage due to scale buildup. Refer to heat exchanger flushing instructions in the manual. Measure the resistance of the safety circuit. Ensure high fire and low fire manifold pressure is correct. Check for improper gas type conversion of the product.</td>
</tr>
</tbody>
</table>
## Maintenance Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Over temperature warning (safety shutdown because unit is too hot).</td>
<td>Check for restrictions in air flow around the unit and vent termination.</td>
</tr>
<tr>
<td></td>
<td>Licensed professional only</td>
<td>Check for foreign materials in combustion chamber and/or exhaust piping.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check for clogged heat exchanger.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check that the gas type being used is correct for the unit.</td>
</tr>
<tr>
<td>30</td>
<td>FV sensor (flammable vapor)</td>
<td>Check sensor wiring for damage.</td>
</tr>
<tr>
<td></td>
<td>Licensed professional only</td>
<td>Measure resistance of sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace sensor.</td>
</tr>
<tr>
<td>31</td>
<td>Burner Sensor.</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Heat exchanger outgoing temp. thermistor.</td>
<td>Check sensor wiring for damage.</td>
</tr>
<tr>
<td></td>
<td>Licensed professional only</td>
<td>Measure resistance of sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clean sensor of scale buildup.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace sensor.</td>
</tr>
<tr>
<td>35</td>
<td>Tank temperature thermistor.</td>
<td>Check sensor wiring for damage.</td>
</tr>
<tr>
<td></td>
<td>Licensed professional only</td>
<td>Measure resistance of sensor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Verify that sensor is properly mounted on the tank surface.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace sensor.</td>
</tr>
</tbody>
</table>
# Maintenance Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>CO or FV sensor.</td>
<td>Check sensor wiring for damage. Measure resistance of sensor. Replace sensor.</td>
</tr>
<tr>
<td>52</td>
<td>Modulating solenoid valve signal.</td>
<td>Check modulating gas solenoid valve wiring harness for loose or damaged terminals. Measure resistance of valve coil.</td>
</tr>
<tr>
<td>61</td>
<td>Combustion fan.</td>
<td>Ensure fan will turn freely. Check wiring harness to motor for damage and/or loose connections. Measure resistance to motor winding.</td>
</tr>
<tr>
<td>63</td>
<td>Circulation flow rate has dropped below 1.3 gpm.</td>
<td>Check water filter for blockage. Check pump operation and wiring. Clean heat exchanger.</td>
</tr>
<tr>
<td>71</td>
<td>Solenoid valve circuit fault (SV0, SV1, SV2, SV3).</td>
<td>Check wiring harness to all solenoids for damage and/or loose connections. Measure resistance of each solenoid valve coil. Replace PCB.</td>
</tr>
</tbody>
</table>
## Maintenance Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>Flame sensing device.</td>
<td><strong>Licensed professional only</strong>&lt;br&gt;Verify flame rod is touching flame when it fires.&lt;br&gt;Check all wiring to flame rod.&lt;br&gt;Remove flame rod and check for carbon buildup.&lt;br&gt;Check inside burner chamber for any foreign material blocking flame at flame rod.&lt;br&gt;Measure micro-amp output of sensor circuit with flame present.&lt;br&gt;Replace flame rod.&lt;br&gt;Replace PCB.</td>
</tr>
<tr>
<td>73</td>
<td>Burner sensor circuit.</td>
<td><strong>Licensed professional only</strong>&lt;br&gt;Check sensor wiring and PCB for damage.&lt;br&gt;Replace sensor.&lt;br&gt;Replace PCB.</td>
</tr>
<tr>
<td>No</td>
<td>code</td>
<td>No hot water, no light or error code on display.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Confirm the water heater is plugged in and has 120 VAC available.</strong> Confirm the water heater is turned on at the temperature controller.</td>
</tr>
</tbody>
</table>
Further explanation of conditions that might cause no hot water and/or No error codes:

Since the hot water supply to the building comes from the tank and not directly from the tankless engine, opening a fixture will not flow water through the engine and will not automatically trigger it to fire.

- The tankless engine will fire only when it detects water flow and since the flow is provided by the built in circulation pump, no code or operation could be the result of the pump not turning on. The issue could be the pump is not being commanded to turn on. If the tank thermistor is faulty or damaged and not reading the correct temperature, it may not be triggering the pump to turn on.

- If the pump is being signaled to turn on and the unit is not sensing flow (due to the pump not operating or not flowing water or due to a damaged flow turbine, flow sensor, disconnected flow sensor, or clogged filter) you should get a code 63 since the flow reading would be “zero”. Code 63 is posted if the flow rate is below 1.3 GPM.
The Technical Data Booklet that is included with the water heater contains specific information for diagnostic service points, voltage and resistance readings.

Layout of wiring and connection points on the wiring diagram correspond directly to the location of these points on the PCB.
# Warranty

## How long does warranty coverage last?

<table>
<thead>
<tr>
<th>Item</th>
<th>Single family Residential applications.</th>
<th>Commercial applications Domestic hot water only</th>
<th>Combination domestic hot water / space heating and all other applications. [3]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Exchanger</td>
<td>10 years [1]</td>
<td>5 years [2]</td>
<td>3 years</td>
</tr>
<tr>
<td>Tank</td>
<td>6 years [1]</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>All other parts and components</td>
<td>3 years [1]</td>
<td>3 years</td>
<td>3 years</td>
</tr>
<tr>
<td>Reasonable labor.</td>
<td></td>
<td>1 year</td>
<td></td>
</tr>
</tbody>
</table>

[1] For residential applications the period of coverage is reduced to 3 years on the heat exchanger and one year on the tank from date of purchase when used as a recirculating water heater within a hot water recirculation loop, where the water heater is in series with a recirculation system and all recirculating water flows through the water heater, and where an aquastat / thermostat, timer or an on-demand recirculation system is not incorporated. A system that incorporates a continuous recirculation due to timer settings, excessive heat loss of the loop or aquastat / thermostat setting will be treated as a continuous recirculation system and have a reduced warranty of 3 years on the heat exchanger and 1 year on the tank.

On-demand recirculation is defined as a hot water recirculating loop or system that utilizes existing hot and cold water lines or a dedicated return line and only activates when domestic hot water is used.

[2] Commercial applications incorporating any type of recirculation have a reduced warranty period of 3 years on the heat exchanger.

[3] Domestic hot water must be heated directly within the water heater. When combined with domestic hot water production the water heater may be connected to provide space heating either directly or indirectly for distributing heated fluid to either a fan coil or similar appliance for space heating purposes.
RH180
FAQ
1. **Is the engine available separately?**
   - No, because the minimum input is 60,000 Btu, ignition occurs at no less than 2 gpm—this is not a viable stand alone tankless product.

2. **Is this product ENERGY STAR rated?**
   - No, currently there is no qualification for tank water heaters over 75,000 Btu.

3. **What is the energy factor rating?**
   - Energy factor ratings are only assigned to tank water heaters with 75,000 Btu or less.

4. **Is this product eligible for any federal tax credits or incentives?**
   - Not at this time. The efficiency is compliant but the Btu for a tank must be less than 75,000 to qualify as a residential water heater.

5. **What happens if the demand is great enough to deplete the tank?**
   - If demand is 3 gpm or less, the engine will service the demand adequately. So, the unit can provide an endless supply of hot water supply to a single standard shower or washing machine, etc.
   - If demand is greater than 3 gpm, after the tank is depleted of its stored hot water, there could be a reduction in temperature—this will be dependent on the flow and groundwater (supply) temperature.
   - It is important to note that full recovery with no demand is only about 15 minutes.

6. **Does the controller beep when there is an error code?**
   - No.
7. **Is this product approved for commercial use?**
   - Yes - light commercial use. Maximum temperature is 140° F.

8. **Is this product approved for circulation? If so, how is the warranty affected?**
   - Yes, circulation can be applied to this system in the same manner as a normal tank. The warranty may be reduced to 3 years on the heat exchanger and 1 year on the tank depending on the type of circulation used. See product warranty for details.

9. **Can drain down solenoid valves be installed?**
   - Due to the design, this would drain the entire tank, which would not be viable.

10. **Are there any high altitude stipulations?**
    - Installation are permitted up to 5,400 ft. only. Installations between 2,001 and 5,400 feet require a dip switch adjustment.

11. **What is the material of the tank?**
    - Carbon-steel glass lined tank. The glass lining reduces corrosion issues.

12. **Can multiple RH180 units be installed together?**
    - Yes. No additional equipment (such as MSA control accessories) is required. They should be installed with balanced parallel piping.

13. **What are the makeup air requirements of the RH180?**
    - Please see the installation manual for the appropriate room calculation procedures to determine this.
RH180
Residential Applications
Before / After Installations

Before

Three, 40 gallon tank water heaters (2-gas, 1-electric) servicing a 5,000 sq. ft. home

The gas units were common vented with a furnace.

No change to the existing vent was required to install the RH180.

The RH180 sufficiently replaced all three tanks.

After
40 gallon gas tank water heater common vented with existing furnace.

No change to existing vent was required beyond junction point.
No change to existing vent beyond junction point.

40 gallon gas tank water heater common vented with furnace.
Before / After Installations

Before

40 gallon gas natural tank. Venting was changed to 4” using the same roof flashing and penetration

After
Two 40 gallon tank water heaters replaced with one RH180, freeing up valuable storage space
This concludes the RH180 Water Heater Training Program Level II

Installation Fundamentals