TANKLESS WATER HEATER
INSTALLATION DIAGRAMS
Tankless Installation / Optional Return Circulation:

Single Tankless Water Heater and Optional Return Circulation:
One single, small capacity water heater that will serve to maintain the temperature of the recirculation loop. The recirculation loop shall be returned to the cold water inlet of the small tank-type water heater. It is recommended that the circulation pump be placed on a timer or controlled by an immersion thermostat.

Legend:

- Cold Water Isolator Valve Assembly
- Hot Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

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Printed in U.S.A 01/09 Form No. RTG11140A
Tankless Water Heater Installation Diagrams

**EZ-Link Manifold Installation / Optional Return Circulation**

![Diagram of EZ-Link Manifold Installation and Optional Return Circulation](image)

**Legend**
- Cold Water Isolator Valve Assembly
- Hot Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

**EZ-Link Manifold Installation and Optional Return Circulation:**
Two tankless water heaters of like models shall be installed in a parallel manifold, connected with the EZ-Link cable. Only one remote control will be used connected to a single tankless water heater. These units will feed a single, small capacity water heater that will serve to maintain the temperature of the recirculation loop. The recirculation loop shall be returned to the cold water inlet of the small tank-type water heater. It is recommended that the circulation pump be placed on a timer or controlled by an immersion thermostat.

Printed in U.S.A 01/09 Form No. RTG11141

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Drawn by: SMT
Eng Approval: RM
Tankless Water Heater Installation Diagrams

EZ-Link Manifold Installation / Optional Return Circulation

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Legend

- Cold Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

**EZ-Link Manifold Installation and Optional Return Circulation:**
Two tankless water heaters of like models shall be installed in a parallel manifold, connected with the EZ-Link cable. Only one remote control will be used connected to a single tankless water heater.

**Recirculation Option A:** The recirculation loop shall be returned to the cold water inlet of the small tank-type water heater with the hot water outlet connected to the hot water line feeding the fixtures. The tank temperature and aquastat should be set 5°F below the tankless thermostat setting, the timer set for peak demand periods. The pump shall be sized according to the loop head loss.

**Recirculation Option B:** The recirculation loop shall be returned to the cold water manifold feeding the tankless. It is required that the circulation pump be placed on a timer and controlled by an immersion thermostat. The aquastat shall be set 10°F below the thermostat setting of the tankless, the timer shall be set for peak demand periods. The pump shall be sized for 5 GPM @ 25’ of head plus the loop head loss.

Small 10 - 15 Gallon Point-of-Use Water Heater
### Tankless Water Heater Installation Diagrams

## Heavy Duty Tankless Manifold Equipment Schedule

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### Tankless Units

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<th>MICS-180 Controller</th>
<th>MIC-K Cable</th>
<th>API12993C Relief Valve</th>
<th>API13892 Isolation Valve Kits†</th>
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<th>Min. Hot Water Header Size (in.) **</th>
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### Optional Equipment and Accessories

- **MIC-180**: Multiple Unit Controller - controls up to 6 units
- **MICS-180**: Multiple Unit Extender - add on to the MIC-180 for control of up to 20 units
- **MIC-K Cables**: Multiple Unit Control Cables, available in 16-, 32-, and 65-foot lengths
- **API12993C**: Pressure Relief Valve - 150 PSI
- **API13892**: Isolation Valve Kit - includes shut-off valves

* MIC-K cable length to be selected based upon water heater layout.
† Valve Kits are optional; Full flow ball valves should be used as a standard
** Smooth copper pipe sizes
*** Black iron pipe sizes (nominal 7 in. w.c. pressure)
**** Black iron pipe sizes (nominal 11 in. w.c. pressure)

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Multiple Unit Manifold Installation:
Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. The manifold controller will manage the operation of the system. Each tankless water heater shall be installed using code-approved isolation valves and unions to allow service to an individual tankless water heater without taking the entire system offline. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG11145, for details on pipe size and suggested equipment.
**Legend**

- Cold Water Isolator Valve Assembly
- Hot Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

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**Tankless Water Heater Installation Diagrams**

**Multiple Unit Manifold Installation with Direct Recirculation:**

Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. The manifold controller will manage the operation of the system. Each tankless water heater shall be installed using code-approved isolation valves and unions to allow service to an individual tankless water heater without taking the entire system offline. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG11145, for details on pipe size and suggested equipment. The return circulation line shall be connected back to the cold water manifold, and include a check valve and a circulation pump that is on a timer and/or an immersion thermostat control. The pump must be sized properly for the system and head loss through the tankless water heater, at least 5 GPM at 25 foot of head. Also, an expansion tank must be installed on the system.

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*Printed in U.S.A 01/09 Form No. RTG11143*
Multiple Unit Manifold Installation with Alternate Indirect Recirculation

Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. Each tankless water heater shall be installed using code-approved isolation valves and unions to allow service to an individual tankless water heater without taking the entire system offline. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG11145, for details on pipe size and suggested equipment. The hot water main return circulation shall be installed according to code and shall circulate through a small storage vessel or point of use water heater that is not connect to electricity. The tankless water heaters shall maintain the temperature of the storage vessel through a secondary circulation loop with a thermostatically controlled pump. The secondary circulation system shall be plumbed so that hot water from the tankless does not return directly to the tankless inlet until it has passed through the storage vessel and so that the hot water main return does not directly recirculate through the tankless water heaters. An immersion aquastat shall control the operation of the secondary circulation pump so that when the temperature of the storage vessel is reached it will turn off the pump. It is recommended that the hot water main circulation line also be controlled by an aquastat and or timer.

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Printed in U.S.A 01/09 Form No. RTG11144
Multiple Unit Manifold Installation with Dual Temperature Recirculation

Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. Each tankless water heater shall be installed using code-approved isolation valves and unions to allow service to an individual tankless water heater without taking the entire system offline. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG11145, for details on pipe size and suggested equipment. The pump must be sized properly for the system and head loss through the tankless water heaters. The low/second temperature return circulation line will be connected back to a small point-of-use tank-type water heater, with a circulation pump controlled by a timer and/or an immersion thermostat control. The tank-type heater will maintain the temperature of the second recirculation loop. Two expansion tanks must be installed, one on each recirculation system.

Legend

- Cold Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Circulation Pump
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

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Drawn by: SMT
Eng Approval: RM

Printed in U.S.A 01/09 Form No. RTG11146
Single Unit Installation with Dual Temperature Recirculation

A single tankless water heater shall be installed using code-approved isolation valves and unions to allow service. Piping or the plumbing manifold should be properly sized for the tankless water heater being installed. The high temperature return circulation line shall be connected back to the main cold water manifold, and include a check valve and a circulation pump that is on a timer and/or an immersion thermostat control. The pump must be sized properly for the system and head loss through the tankless water heaters. The low/second temperature return circulation line will be connected back to a small point-of-use tank-type water heater, with a circulation pump controlled by a timer and/or an immersion thermostat control. The tank-type heater will maintain the temperature of the second recirculation loop. Two expansion tanks must be installed, one on each recirculation system.
Single Unit Installation with Dual Temperature Recirculation

A single tankless water heater shall be installed using code-approved isolation valves and unions to allow service. Piping or the plumbing manifold should be properly sized for the tankless water heater being installed. The high temperature return circulation line shall be connected back to the cold water input of the Booster Heater, and include a check valve and a circulation pump that is on a timer and/or an immersion thermostat control. The pump must be sized properly for the system and head loss through the tankless water heaters. The low/second temperature return circulation line will be connected back to the cold water main at the tankless water heater, with a circulation pump controlled by a timer and/or an immersion thermostat control. The booster heater will maintain the temperature of the second recirculation loop. Two expansion tanks must be installed, one on each recirculation system.
**Tankless Water Heater Installation Diagrams**

**EZ-Link Manifold Installation / Optional Return Circulation**

**Legend**
- Cold Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

**EZ-Link Manifold Installation and Optional Return Circulation:**
Two tankless water heaters of like models shall be installed in a parallel manifold, connected with the EZ-Link cable. Only one remote control will be used connected to a single tankless water heater.

**Recirculation Option A:** The recirculation loop shall be returned to the cold water inlet of the small tank-type water heater with the hot water outlet connected to the hot water line feeding the fixtures. The tank temperature and aquastat should be set 5°F below the tankless thermostat setting, the timer set for peak demand periods. The pump shall be sized according to the loop head loss.

**Recirculation Option B:** The recirculation loop shall be returned to the cold water manifold feeding the tankless. It is required that the circulation pump be placed on a timer and controlled by an immersion thermostat. The aquastat shall be set 10°F below the thermostat setting of the tankless, the timer shall be set for peak demand periods. The pump shall be sized for 5 GPM @ 25’’ of head plus the loop head loss.

This drawing is intended as a guide only. It is not to be used as an alternative to a professionally engineered project drawing. This drawing does not imply compliance with local building codes. Installation may vary, depending on installation location, and must be done in accordance with all local building codes. Consult with local building officials prior to installation.

Printed in U.S.A. 01/11 Form No. RTG11141 Rev 2
Single Tankless Water Heater with Domestic Water and Home Heating:
One tankless water heater installed in a dual use system with domestic water and an air handler for home heating. The system will supply a maximum of 140°F water to the air handler. A thermostatic tempering valve will provide control for the 120°F domestic water temperature. The heating system will be controlled by a room thermostat or environmental control system. There will be a priority switch (flow detector) installed in the cold water source line. The priority switch will deactivate the circulation pump and air handler while water is being drawn from the cold water supply, such as for showering. The priority switch will reactivate the circulation pump and air handler when the domestic water supply is not in use. The circulation pump must be able to supply a minimum of 5 GPM at 35° of head loss and shall be controlled by the room thermostat or environmental control system. An expansion tank shall be installed on the system to control thermal expansion when the air handler is in use. The air handler, circulation pump, and tankless water heater should be sized by a professional contractor or mechanical engineer to ensure proper operation.

**Legend**

- Cold Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

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Multiple Unit Manifold Installation with Buffer Storage Tank

Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG11145, for details on pipe size and suggested equipment. The storage vessel will be fed direct from the tankless and act as a buffer between the fixtures and tankless. A Taco 0011 pump or greater shall be used to circulate the water from the storage vessel back to the tankless units and an immersion thermostat in the storage vessel will control the circulation pump so that the tankless are used only when the temperature of the tank drops. The tankless will also operate when a demand is placed on the system such as a hot water use fixture is turned on. A return circulation line from the fixtures will be feed back to the storage tank with an appropriately sized circulation pump, placed on a timer to limit the hours of operation.

Legend

- Cold Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

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Printed in U.S.A 01/09 Form No. RTG11150

Drawn by: SMT
Eng Approval: RM
Multiple Unit Manifold Installation with Direct Return Recirculation

Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG1 1145, for details on pipe size and suggested equipment. A Taco 0011 pump or greater shall be used to circulate the water from the return recirculation line back to the tankless units and an immersion thermostat in recirculation line will control the circulation pump so that the tankless are used only when the temperature of the loop temperature drops. The tankless will also operate when a demand is placed on the system such as a hot water use fixture is turned on.

Legend

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Printed in U.S.A 02/10 Form No. RTG1 1151
Tankless Water Heater Installation Diagrams

Multiple Unit Manifold Installation Stacked Configuration

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Printed in U.S.A 03/08 Form No. PI1030706
**Tankless Water Heater Installation Diagrams**

**Tankless Installation / Demand Return Circulation**

Single Tankless Water Heater and Demand Return Circulation:
A demand return circulation system is one that the pump is controlled by system as to where the pump is only operated for a short duration to bring hot water to the desired fixture. A demand system operates with either a push button or motion detector and shut off as soon as hot water reaches the fixture. A circulation pump with a timer and/or aquastat is not considered a demand pump as they can continuously run.

The Metlund D'MAND® System is an alternative to a hot water circulation loop and operates in a manner that only runs when hot water is needed at the fixture. A demand system of this type does not impact the warranty of our tankless water heaters.

This drawing demonstrates a basic installation of a demand system with a tankless water heater. Follow the manufactures recommended installation instructions and guidelines.

**Legend**

- Cold Water Isolator Valve Assembly
- Hot Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

**Printed in U.S.A.  06/08  Form No. RTG11154**
Multiple Unit Manifold Installation with Buffer Tank and Demand Recirculation

Multiple tankless water heaters of like models shall be installed in a parallel manifold, connected with a common manifold control through communication cables, with only one remote control connected to the manifold controller. The units will operate in a random sequence depending upon the water flow rate through the system. Each tankless water heater shall be installed using code-approved isolation valves and unions to allow service to an individual tankless water heater without taking the entire system offline. Piping or the plumbing manifold should be properly sized for the number of tankless water heaters being installed. See the Manifold Equipment Schedule, Form No. RTG11145, for details on pipe size and suggested equipment. The hot water main shall be installed according to code and shall pass through a small water heater or storage tank that will be used as a buffer tank to eliminate the cold water sandwich effect from short cycle usage. The buffer tank shall have openings sized to match the manifold pipe size. The main hot water line will feed branch fixtures after the buffer tank. A demand or thermostatically controlled circulation pump, such as the Metlund S-70T or S-02T, or the Laing ACT-909, shall be installed on each branch at the furthestmost fixture. These pumps will operate to draw hot water to the fixture by pushing the cold water back through the cold water supply line. When the hot water reaches a given temperature as set by the pump manufacturer, the pump will shut off. This application is ideal in salons, public rest rooms, and nursing homes where the draw demands on hot water are short and spaced apart.

Multiple Unit Manifold Installation Diagrams

Legend

- Cold Water Isolator Valve Assembly
- Hot Water Isolator Valve Assembly
- Pressure Relief Valve
- Shut-off Valve
- Check Valve
- Union
- Gas Pipe
- Cold Water Pipe
- Hot Water Pipe
- Return Circulation Line

This drawing is intended as a guide only. It is not to be used as an alternative to a professionally engineered project drawing. This drawing does not imply compliance with local building codes. Installation may vary, depending on installation location, and must be done in accordance with all local building codes. Consult with local building officials prior to installation.

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Single Tankless Water Heater as a Solar Booster:
A tankless unit will be connected inline with the hot water output of a solar storage tank and the hot water supply to the fixtures. The supply to the tankless must be connected to a thermostatic mixing valve so that the tankless does not receive water exceeding 140°F. The tankless unit(s) should be sized according to the total demand of the application. When the water temperature drops below the T-stat setting on the tankless and the flow is great enough, the tankless unit will engage. Refer to the tankless Use and Care manual for installation instructions and recommendations for the tankless water heater.
This drawing is intended as a guide only. It is not to be used as an alternative to a professionally engineered project drawing. This drawing does not imply compliance with local building codes. Installation may vary, depending on installation location, and must be done in accordance with all local building codes. Consult with local building officials prior to installation.

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See Drawing RTG11140 for typical piping installations.

The RTG20147 Kit Contains:
(1) 3/5" Appliance Adapter - RTG20144
(1) 3/5" Horizontal Termination - RTG20128
(1) 94 Degree 3/5" Elbow - No Rheem Part Number
(2) 12" Wall Plate, Screws - No Rheem Part Number
(1) 3/5" Concentric 12" Vent Pipe - RTG20151R
(1) Relief Valve - AP12993C
(1) 10ft T-Stat Wire - RTG20009-1
RTG-95DVT Direct Vent Water Heater
Water Heater(s) shall be internally mounted, instantaneous, multiple point-of-use, gas fired, direct vent, water heater design certified to the ANSI Z21.10.3 standard for gas-fired water heaters. Each Water Heater shall produce no more than 55 ppm NOx (40 ng/J) emissions when tested in accordance with the Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). Said water heater(s) shall be configured to operate with _______ (natural/propane) gas and a 120 volt/60 Hz AC power source.

Unit(s) shall have a BTU input range of 11,000 BTU/hr to 199,900 BTU/hr, a minimum recovery efficiency rating of 82%, a minimum hot water outlet capacity of 9.5 gallon per minute (with a 35°F temperature rise), and a minimum operating flow rate of 0.26 (0.40 activation) gallon per minute (with a 35°F temperature rise). Water Heater(s) shall be microprocessor controlled and utilize a direct electronic ignition system (with no standing pilot), fully modulating gas control valve, turbine water flow meter, automatic electro-mechanical water flow control valve, and water temperature thermistors to maintain outlet water temperature between ±2°F of setpoint temperature. Unit(s) shall incorporate the following internal safety devices: incomplete combustion sensing burner technology, film-type thermal overheat protection covering entire heat exchanger, flame failure lockout, internal freeze protection for ambient temperatures as low as –30°F, and lockout protection in the event of a blocked flue.

Water Heater(s) shall be provided with a remote temperature thermostat with an adjustable setpoint range of 85°F to 140°F. Unit(s) shall also be capable of storing and displaying up to 8 diagnostic maintenance codes, via the display on the remote temperature thermostat controller(s). Water Heater(s) shall have a copper heat exchanger warranted against material defects or workmanship for a period of 12 years from the date of purchase, or 3 years from date of purchase when used as a circulating water heater within a hot water circulation loop. Unit(s) shall have stainless steel burners, cast aluminum gas control valve/gas connection, and solid brass inlet and outlet water connections. Unit(s) shall also be provided with a 120 volt/60 Hz AC power cord. These and all other parts shall be warranted against material defects or workmanship for a period of 5 years from the date of purchase, or 3 years from date of purchase when used as a circulating water heater within a hot water circulation loop or when used in a commercial application. Unit(s) shall have stainless steel burners, cast aluminum gas control valve/gas connection, and solid brass inlet and outlet water connections. These and all other parts shall be warranted against material defects or workmanship for a period of 5 years from the date of purchase, or 3 years from date of purchase when used as a circulating water heater within a hot water circulation loop or when used in a commercial application.

Water Heater(s) shall be suitable for use in multiple unit electronic manifold installations. Units shall have the ability to be manifolded electronically in configurations from 2-20 units. Temperature control and diagnostic functions for all water heaters in manifold installations shall be controlled via a single remote temperature thermostat. Manifold installations utilizing 2 water heaters shall be accomplished with simple cable-only interconnection (EZ-Link). Manifold installations utilizing 2 water heaters shall be accomplished with simple cable-only interconnection (EZ-Link). Manifold installations utilizing up to 20 units with an external manifold controller system (MIC-185/MICS-180).

RTG-95X Outdoor Water Heater
Water Heater(s) shall be externally mounted, instantaneous, multiple point-of-use, gas fired, direct vent, water heater design certified to the ANSI Z21.10.3 standard for gas-fired water heaters. Each Water Heater shall produce no more than 55 ppm NOx (40 ng/J) emissions when tested in accordance with the Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). Said water heater(s) shall be configured to operate with _______ (natural/propane) gas and a 120 volt/60 Hz AC power source.

Unit(s) shall have a BTU input range of 11,000 BTU/hr to 199,900 BTU/hr, a minimum recovery efficiency rating of 82%, a minimum hot water outlet capacity of 9.5 gallon per minute (with a 35°F temperature rise), and a minimum operating flow rate of 0.26 (0.40 activation) gallon per minute (with a 35°F temperature rise). Water Heater(s) shall be microprocessor controlled and utilize a direct electronic ignition system (with no standing pilot), fully modulating gas control valve, turbine water flow meter, automatic electro-mechanical water flow control valve, and water temperature thermistors to maintain outlet water temperature between ±2°F of setpoint temperature. Unit(s) shall incorporate the following internal safety devices: film-type thermal overheat protection covering entire heat exchanger, flame failure lockout, internal freeze protection for ambient temperatures as low as –30°F.

Water Heater(s) shall be provided with a remote temperature thermostat with an adjustable setpoint range of 85°F to 140°F. Unit(s) shall also be capable of storing and displaying up to 8 diagnostic maintenance codes, via the display on the remote temperature thermostat controller(s). Water Heater(s) shall have a copper heat exchanger warranted against material defects or workmanship for a period of 12 years from the date of purchase, or 3 years from date of purchase when used as a circulating water heater within a hot water circulation loop or when used in a commercial application. Unit(s) shall have stainless steel burners, cast aluminum gas control valve/gas connection, and solid brass inlet and outlet water connections. These and all other parts shall be warranted against material defects or workmanship for a period of 5 years from the date of purchase, or 3 years from date of purchase when used as a circulating water heater within a hot water circulation loop or when used in a commercial application.

Water Heater(s) shall be suitable for use in multiple unit electronic manifold installations. Units shall have the ability to be manifolded electronically in configurations from 2-20 units. Temperature control and diagnostic functions for all water heaters in manifold installations shall be controlled via a single remote temperature thermostat. Manifold installations utilizing 2 water heaters shall be accomplished with simple cable-only interconnection (EZ-Link). Manifold installations utilizing 2 water heaters shall be accomplished with simple cable-only interconnection (EZ-Link). Manifold installations utilizing up to 20 units with an external manifold controller system (MIC-185/MICS-180).