

TANKLESS PRODUCT GUIDE





Energy-efficient, plentiful, and
endless supply of hot water.

**SAVE
ENERGY.**



Compact size and wall-mounted
to free up valuable floor space.

**SAVE
SPACE.**



The smart choice that will save you
a substantial amount of energy.

**SAVE
MONEY.**



The A. O. Smith brand has delivered innovative hot water solutions for over 70 years and is sold exclusively by plumbing wholesalers and plumbing contractors. A. O. Smith's selection of residential and commercial tank-type, tankless & hybrid water heaters, boilers and storage tanks is unmatched for quality and diversity. Anywhere hot water is needed, A. O. Smith provides an energy-efficient solution with long-lasting value for years after it's installed. A. O. Smith stands behind its products and customers with world-class service, combining cutting-edge technology with committed people who take pride in being the very best.

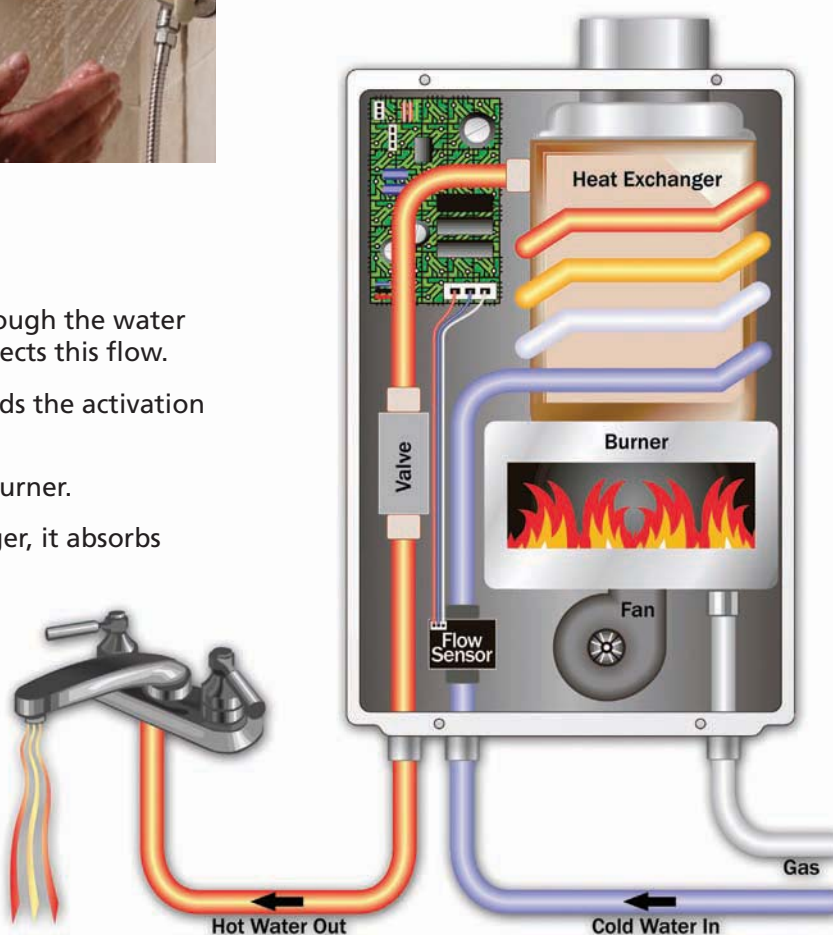
A. O. Smith is headquartered in Ashland City, Tennessee, home of the world's largest water heater factory. The A. O. Smith network includes five manufacturing facilities in North America, plus plants in Nanjing, China and Veldhoven, The Netherlands.

Tankless Advantage



HOW IT WORKS – The Process:

- A hot water tap is opened.
- The opened tap allows water to flow through the water heater. An internal water flow sensor detects this flow.
- Upon flow detection, the flow sensor sends the activation signal to the computer board.
- The computer automatically ignites the burner.
- As water flows through the heat exchanger, it absorbs heat from the burner.
- By the time the water exits the heater, it has reached the designated set temperature.
- When the hot water tap is closed, the water heater automatically turns off.



ENDLESS HOT WATER*

Heating water only as it's being used means you will never run out of hot water again. After the few seconds it takes for the water to reach the designated set temperature, our water heaters will continually provide a steady flow of hot water for as long as your application needs it.

*A. O. Smith tankless water heaters provide endless hot water when sized appropriately for your homes needs.

ENERGY CONSERVATION

Provides you with continuous hot water... in one of the most energy-efficient ways possible. Conventional tank-type water heaters will heat and store a set volume of water, regardless of whether someone is using that hot water or not. Because our water heaters only activate when hot water is being used, no standby energy losses are incurred, providing efficient heating and conserving gas energy.

COMPACT SIZE

On top of all this, an A. O. Smith tankless water heater takes up much less space than your conventional tank-type water heater or boiler. With no tank or boiler to steal valuable storage space, A. O. Smith's wall-mount design allows for additional storage and flexibility.

Safety

At A. O. Smith, we place the safety and reliability of our products above all else. By incorporating technologically advanced safety features into every model, we provide the assurance and peace-of-mind that can only come from an A. O. Smith quality product.

Air-Fuel Ratio (AFR) Sensor

A. O. Smith's unique AFR sensor monitors and maintains proper combustion at all times. Together with the onboard computer, this system will adjust the fan motor speed to ensure that air and fuel have a proper mixture ratio, minimizing emissions and maximizing efficiency.

Additional Safety Features

Freeze Protection:

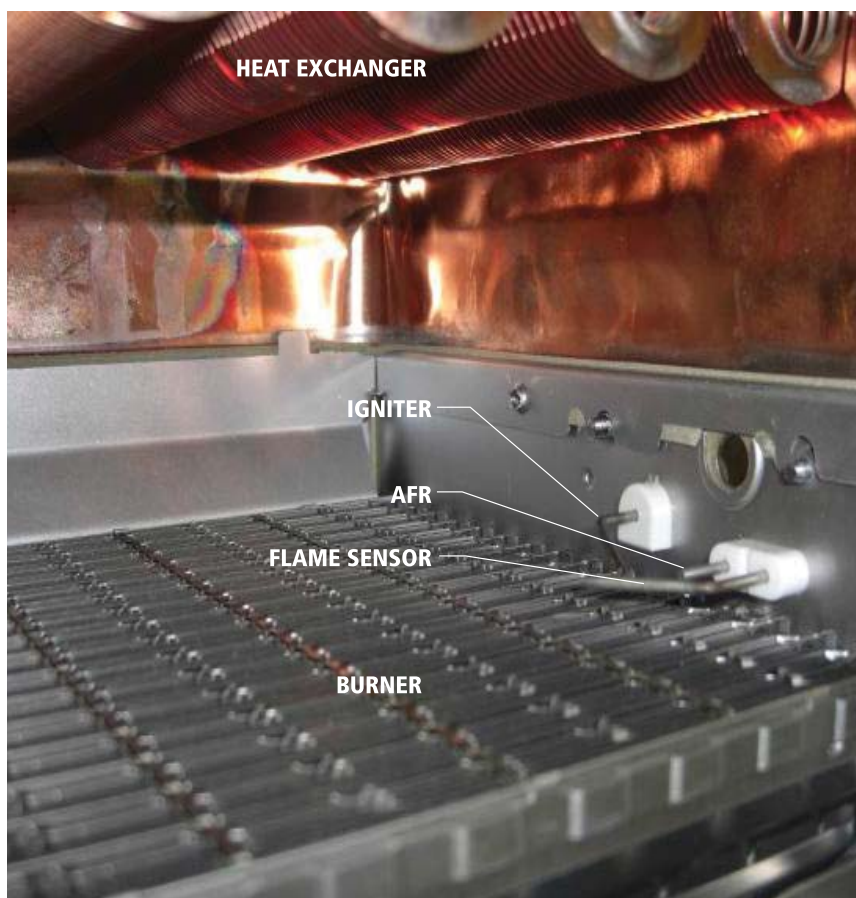
Every heater in A. O. Smith's tankless lineup has an internal freeze protection system, which is rated to protect the heaters when installed in sub-freezing conditions. This system ensures that water temperatures within the heat exchanger never fall below a certain level, preventing freeze damage.

Hi-Limit Switch:

Ensures that water temperatures do not exceed unsafe levels. Before the water temperature can even reach these unsafe levels, the hi-limit switch activates by disengaging the gas valves, effectively shutting down the water heater.

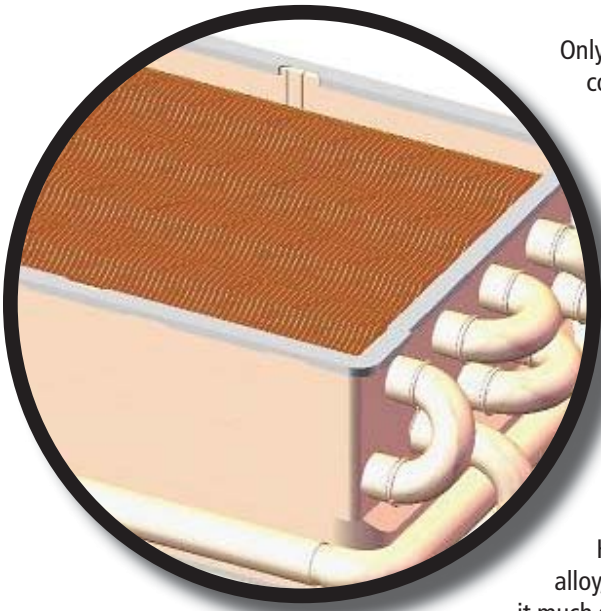
Overheat Cutoff Fuse:

Ensures that there are no breaches in combustion. In cases where enough physical damage might have been done to the water heater to lead to a breach in combustion, the overheat cutoff fuse reacts by shutting down the water heater if the surface of the heat exchanger retains too much heat.



Durability

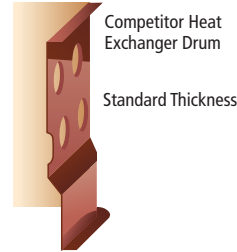
Heat Exchanger HRS35



Only A. O. Smith incorporates true commercial-grade heat exchangers in our tankless heaters. (NOTE: 240H Series, 340H Series, 510 Series, 510U Series, 540H Series, 710 and 910 Series non-ASME models) All aspects of the heat exchanger were designed to add the durability and reliability that is vital to any successful commercial organization or business.

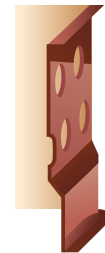
HRS35 Copper Alloy

HRS35 is a heat-resistant copper alloy, with additive elements that make it much stronger and harder than the standard C1220 copper used in most other heat exchangers. HRS35 has 8 times the tensile strength of regular copper. Even at high temperatures, HRS35 maintains a fine grain and high strength. HRS35 provides resistance to the damaging effects of erosion that can cause heat exchangers to leak.



Competitor Heat Exchanger Drum

Standard Thickness



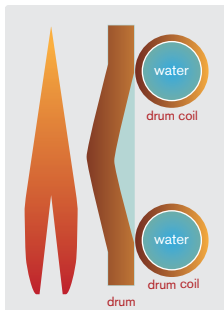
A. O. Smith Commercial & Light-Commercial Heat Exchanger Drum

25% Thicker

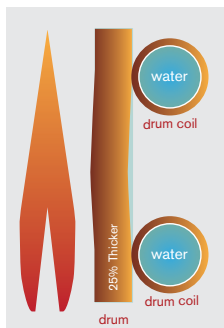


HRS35 copper tubing

A thinner drum strains more under heat stress



A thicker drum creates less strain on the heat exchanger



Comparison between HRS35 copper alloy and C1220 standard copper

	Cu	Co	Sn	Zn	Ni	P
HRS35	99.5%	0.18%	0.10%	0.05%	0.04%	0.05%
C1220 (Standard Copper)	>99.9%	---	---	---	---	0.015% - 0.04%

*HRS35 copper alloy utilized in non-ASME models only

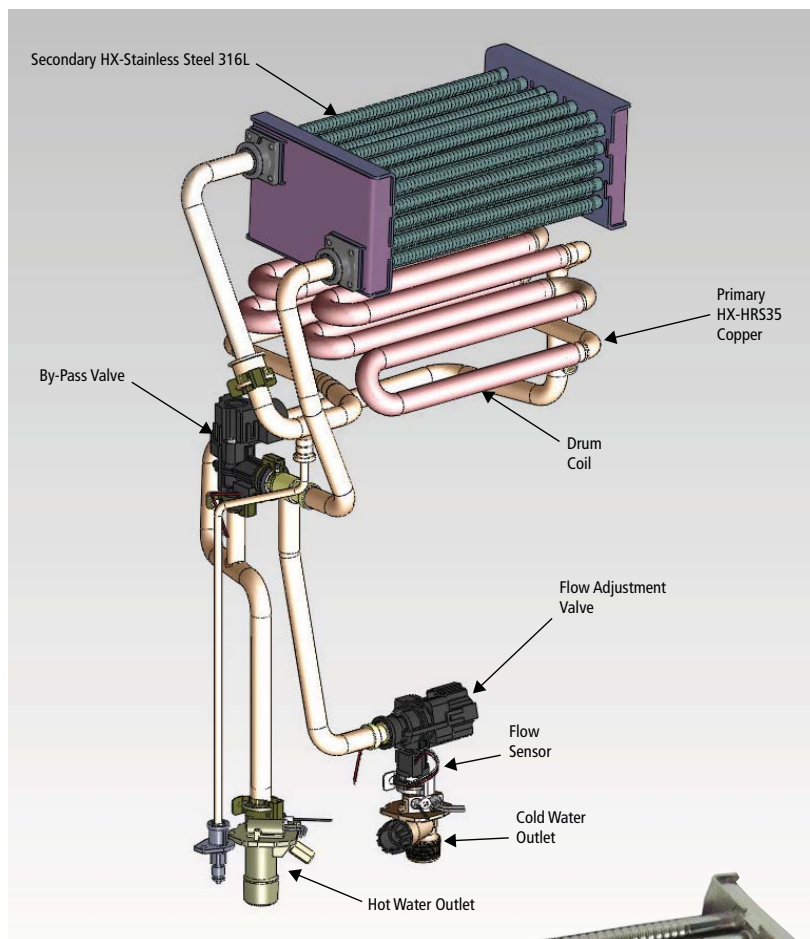
Drum Thickness

During every ignition cycle, thermal expansion causes all heat exchangers to undergo heat stress. After the thousands of ON/OFF cycles typically seen in a commercial application, this heat stress can prove damaging. This is why the heat exchangers in our commercial and light commercial products utilize drums that are 25% thicker, ensuring the longevity of our products. A thicker drum creates less strain on the heat exchanger.

Secondary Heat Exchanger 316L Stainless Steel (Condensing Models Only)

The secondary condensing heat exchanger is made of high quality 316L stainless steel. This is where the rest of the heat transfer occurs. Due to the lower temperature, acidic condensation occurs, and stainless steel is required in order to avoid corrosion.

For condensing heat exchangers, it is more suitable to use 316L stainless steel because of the extreme environment (heat, acidic condensation, chloride) that the material is subjected to.



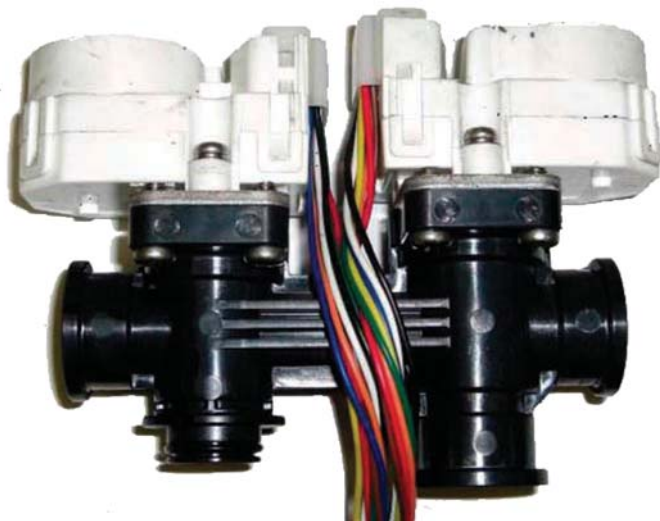
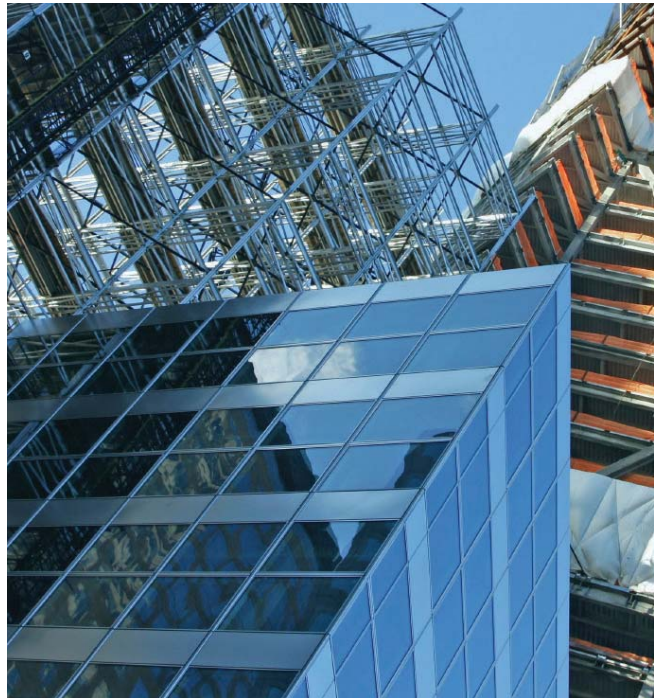
Primary Heat Exchanger: Copper vs Stainless Steel

- Heat transfers 25 times more readily through copper than stainless steel. Consequently, for the same amount of heat transfer, stainless steel heat exchangers need to be larger than copper heat exchangers, leading to a larger pressure loss.
- At higher temperatures, it is the nature of stainless steel to become prone to a number of problems not usually experienced at room temperature. It is vulnerable to pitting corrosion and stress corrosion cracking (SCC).
 - Stainless steel is **NOT** better for durability because it is harder. Hardness causes the material to become brittle. Stainless steel will crack after numerous cycles of thermal expansion/contraction, especially with chloride in the water. Copper heat exchangers are less brittle and better suited for expansion/contraction without cracking. Copper is also better with heat transfer.
 - In a *dual* heat exchanger design, corrosion is not a big concern in the non-condensing primary heat exchanger because no condensation forms on the exterior of the pipes. Stainless steel is unnecessary for this stage.

Water Valves

Making true commercial-grade water heaters involves more than just redesigning our heat exchangers - every internal component has to measure up to A. O. Smith's commercial standards. Just like our advanced heat exchangers, the longevity and functionality of components such as our water valves and flow sensors are also of great importance.

Our heavy-duty commercial water heaters (510/U, 540H, 710 series & 910 series) feature a bypass & flow adjustment valve, which not only provide the optimal control and precision essential for commercial usage, they offer the durability needed to handle tough, high-volume conditions.



Stepper Motor Water Valves



By-pass Valve - 510/U and 540H Models



Flow Adjustment - 510/U and 540H Models

Water Flow

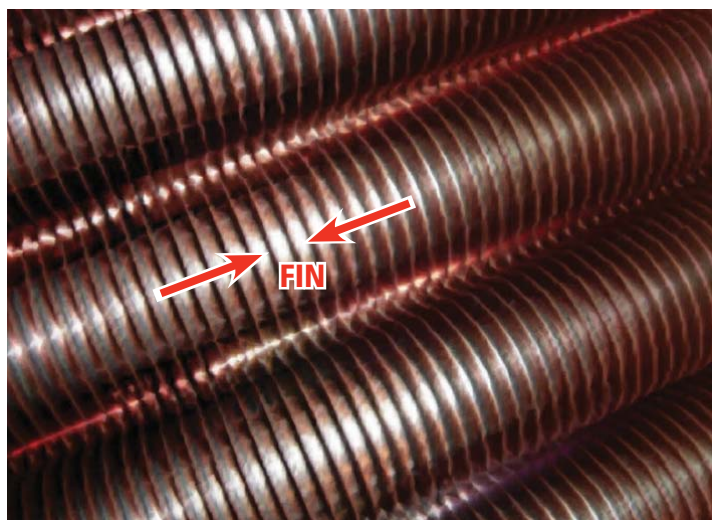
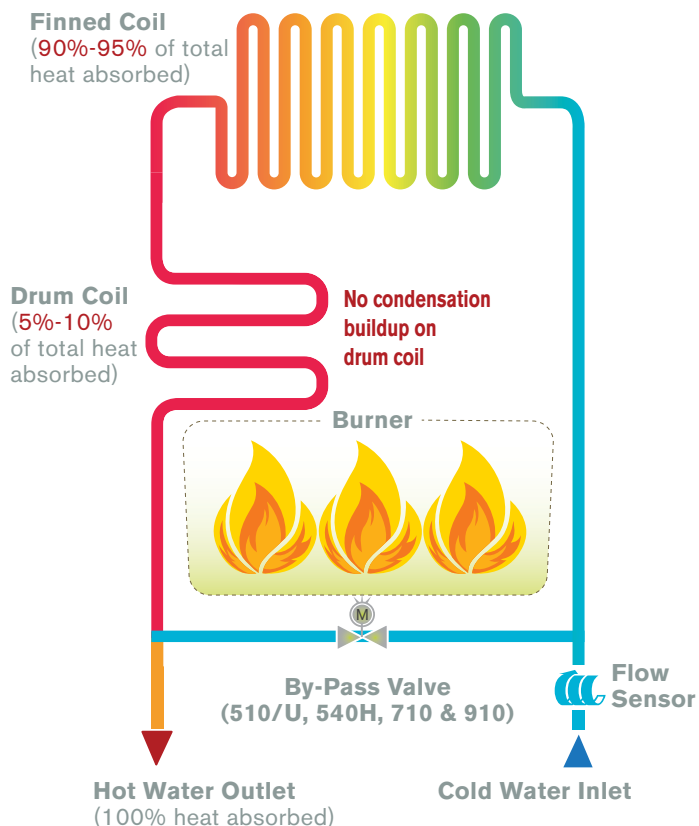
Condensation can build up over time in any heat exchanger, causing damage and premature leaks. A. O. Smith's heavy-duty commercial models (710 series & 910 series) include condensation reduction features that safeguard against these types of damaging effects.

Better Water Pathway Design

By redesigning and redirecting the flow of water, the temperature of the heat exchanger drum and finned coils stays elevated above dew point, making it much more difficult for condensation to build.

Fin Pitch

By widening the pitch of the heat exchanger fins, not only do we improve durability by reducing occurrences of blockage, we also maintain higher temperatures on the upper finned coils. Keeping these coils at elevated temperatures reduces the likelihood of condensation buildup.



BASIC SIZING GUIDELINES

The flow rate capacity of tankless water heaters depends on the temperature difference between the desired output and incoming water temperature. The flow rate comparison chart and table shown here summarizes the flow rate charts found in the specifications of each model.

A. O. Smith water heaters are sized according to the peak flow rate requirements, worst-case temperature-rise scenarios, and types of applications. Once these factors have been determined, refer to either the flow rate comparison here or the flow rate charts found in each model's specifications. Select the appropriate water heater as well as the amount of water heaters required.

Application designers/engineers can decide whether to size for full flow, expected flow, or utilize probability models such as the modified "Hunter Curve". For large scale applications such as hotels, apartment complexes, and large restaurants, Hunter Curves are commonly used to estimate the peak flow rate demand when given the total amount of fixture units within an application. It is up to the application designer/engineer to determine the amount of fixture units within any given application.

Match the Unit to Your Needs

Warmer Climates 70°F Incoming Groundwater Temperature		Cooler Climates 50°F Incoming Groundwater Temperature		
Capacity – Number of Shower Heads				
AT10-110/U	2 Showers		1 Shower	
AT10-140H	2 Showers		1 Shower	
AT10-310/U	3 Showers		2 Showers	
AT10-240H	2 Showers		1 Shower	
AT10-340H	3 Showers		2 Showers	
AT10-540H	4 Showers		3 Showers	
AT10-510/U	4 Showers		2 Showers	
AT10-710	4 Showers		3 Showers	
AT10-910	6 Showers		4 Showers	

Assuming the set point temperature is 120°F

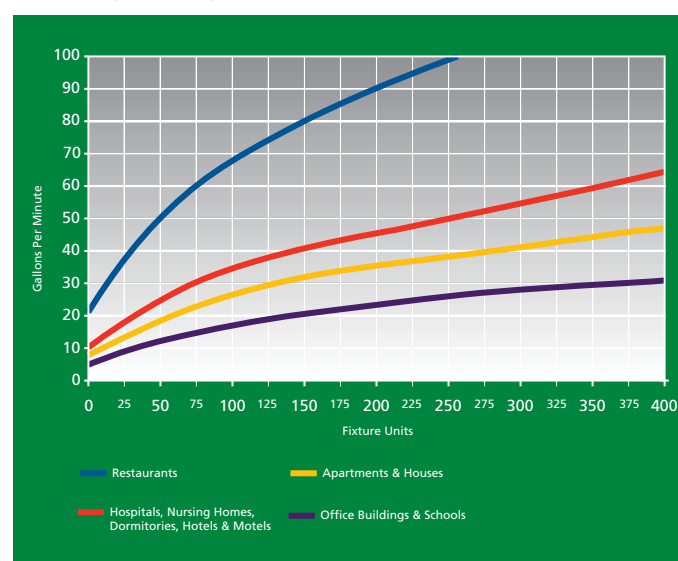
Flowrate Guide

Temperature Rise vs Gallons per Minute

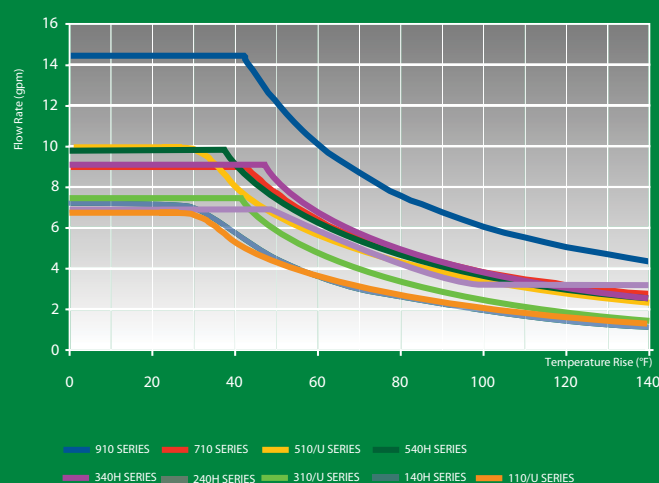
Temp Rise	110/U Series	140H Series	310/U Series	510/U Series	240H Series	340H Series	540H Series	710 Series	910 Series
30°	6.6	6.6	8.0	10.0	6.6	8.0	10.0	9.0	14.5
35°	6.6	6.4	8.0	9.3	6.6	8.0	10.0	9.0	14.5
40°	5.7	5.6	7.8	8.1	6.6	8.0	9.5	9.0	14.5
45°	5.1	5.0	6.9	7.2	6.6	7.6	8.4	8.5	13.5
50°	4.6	4.5	6.2	6.5	6.1	6.8	7.6	7.7	12.2
55°	4.2	4.1	5.7	5.9	5.5	6.2	6.9	7.0	11.1
60°	3.8	3.7	5.2	5.4	5.1	5.7	6.3	6.4	10.1
65°	3.5	3.4	4.8	5.0	4.7	5.3	5.8	5.9	9.4
70°	3.3	3.2	4.4	4.7	4.3	4.9	5.4	5.5	8.7
75°	3.1	3.0	4.1	4.3	4.1	4.6	5.0	5.1	8.1
80°	2.9	2.8	3.9	4.1	3.8	4.3	4.7	4.8	7.6
85°	2.7	2.6	3.7	3.8	3.6	4.0	4.4	4.5	7.2
90°	2.5	2.5	3.5	3.6	3.4	3.8	4.2	4.3	6.8
95°	2.4	2.3	3.3	3.4	3.2	3.6	4.0	4.0	6.4
100°	2.3	2.2	3.1	3.3	3.0	3.4	3.8	3.8	6.1

Flow rate is determined by Temperature Rise. To determine your temperature rise, subtract the incoming water temperature from the set output temperature. All units are factory set to 120 or 122°F but can be changed.

Example of Hunter Curves for Sizing Large Applications



Comparison of Flow Rates vs. Temperature Rise

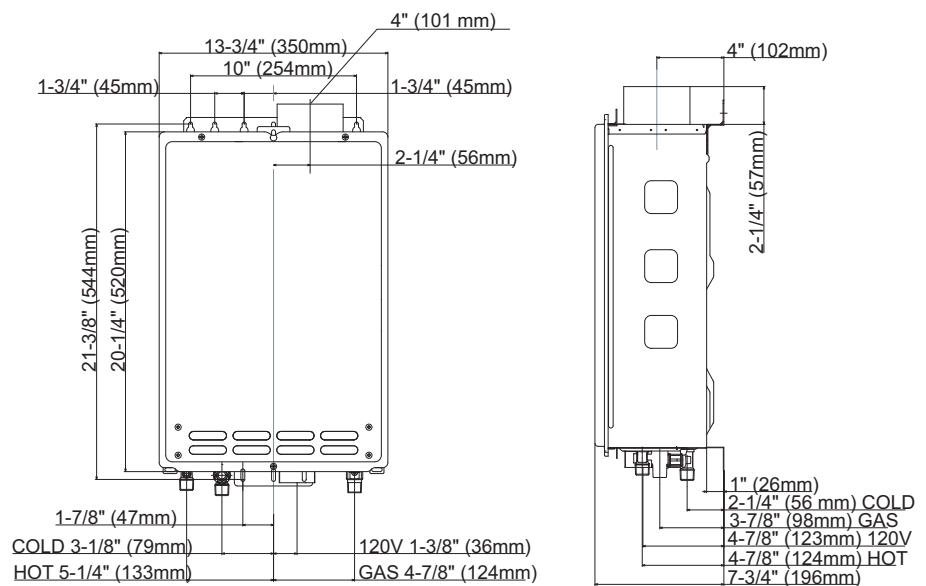


110 Series

The 110 Series is great for apartments, one bath homes in cold climates, condos and summer cabins. Remote control included as a standard feature.



Dimensions



Specifications

Provides a variety of installation options: indoor, outdoor, and direct vent.

Warranty Information**

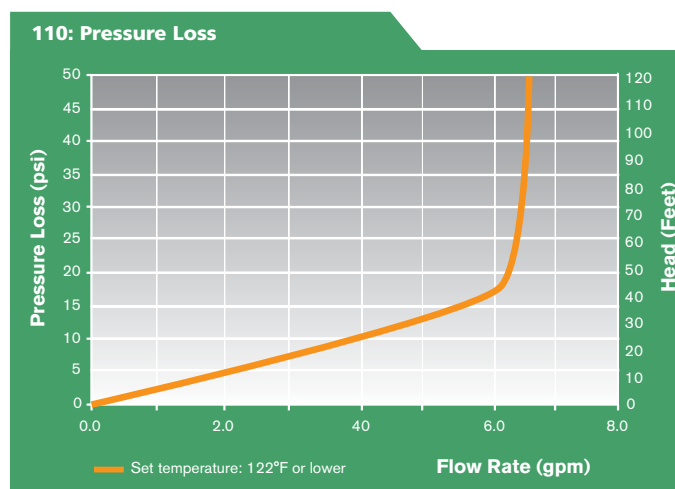
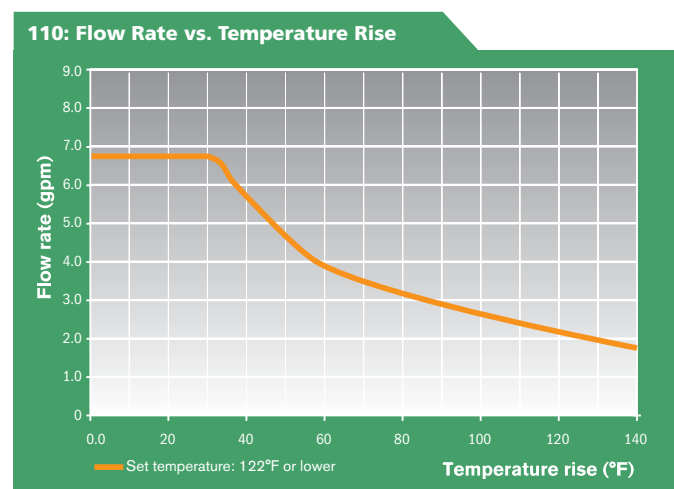
Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

**Refer to www.hotwater.com for further warranty details.

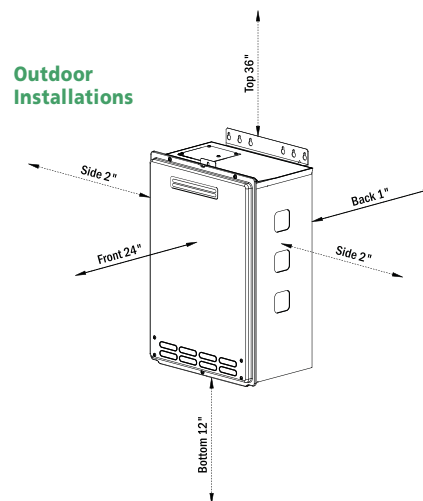
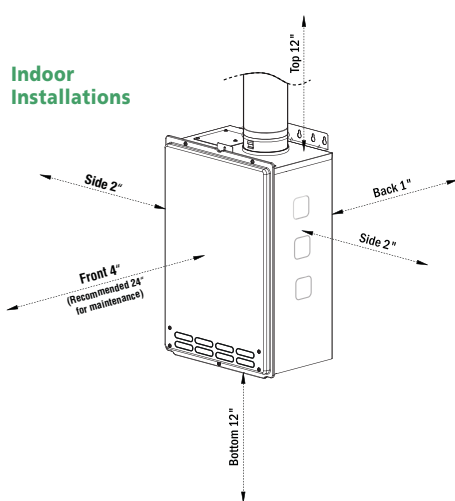
ATI-110 includes both a remote control and power cord as standard features

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	20-1/4" (H) X 13-3/4" (W) X 7-3/4" (D), Weight :33 lbs			
Electric	120 V	0.77 A (Operation)	0.052 A (Standby)	0.93 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	19,500 BTU/h	19,500 BTU/h	
	Max. Input	140,000 BTU/h	140,000 BTU/h	
Energy Factor		0.82	0.82	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	6.6 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	N/A	N/A	
	Multi-Unit System	N/A	N/A	
110 Temperature Settings	Dipswitches	113°F	122°F (default)	131°F 140°F
	With 9007666005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	99°F to 167°F (16 options), 122°F Default Factory Setting			



Clearance

Clearances to Combustible and Non-Combustible Surfaces

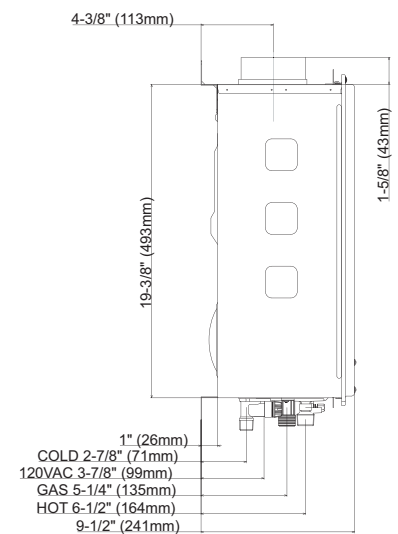
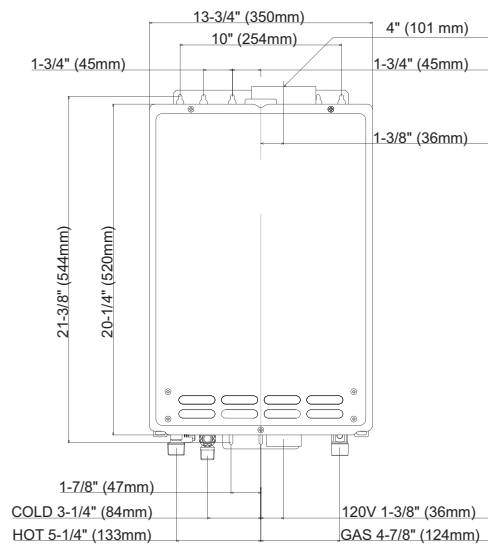


310 Series

The 310 Series is the most versatile and popular tankless model we offer. The 310 features a max flow rate of 8.0 gpm providing enough hot water to run three showers at the same time. Remote control included as a standard feature.



Dimensions



Specifications

Provides a variety of installation options: indoor, outdoor, and direct vent.

Warranty Information**

Residential Use:

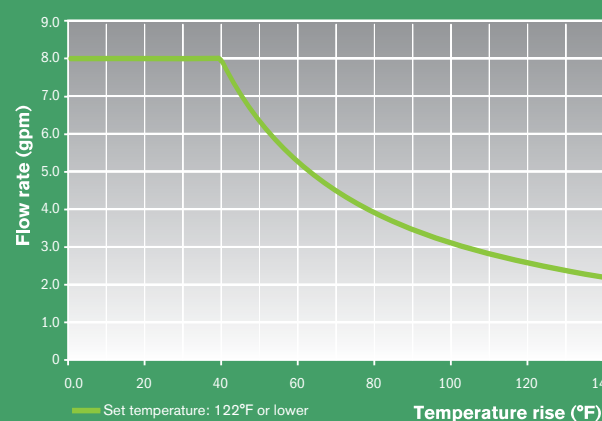
15 yrs limited heat exchanger, 5 yrs limited parts

**Refer to www.hotwater.com for further warranty details.

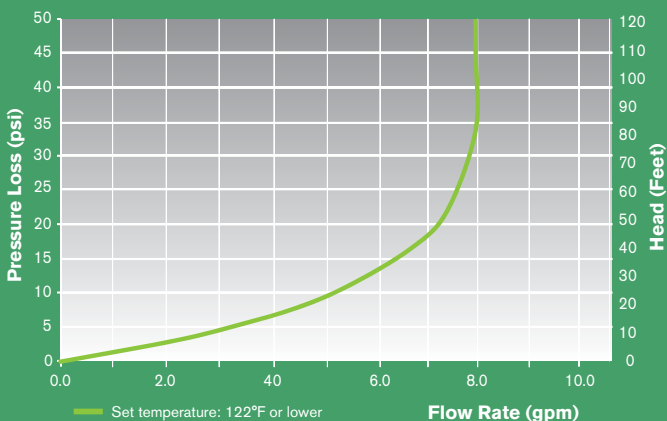
ATI-310 includes both a remote control and power cord as standard features

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	20-1/4" (H) X 13-3/4" (W) X 9-1/2" (D) , Weight :38 lbs			
Electric	120 V	0.77 A (Operation)	0.052 A (Standby)	0.93 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	11,000 BTU/h	11,000 BTU/h	
	Max. Input	190,000 BTU/h	190,000 BTU/h	
Energy Factor		0.82	0.82	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	8.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	N/A	N/A	
	Multi-Unit System	N/A	N/A	
310 Temperature Settings	Dipswitches	104°F	113°F	122°F (default) 131°F 140°F 158°F 176°F 185°F
	With 9007666005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	99°F to 167°F (16 options), 122°F Default Factory Setting			

310: Flow Rate vs. Temperature Rise

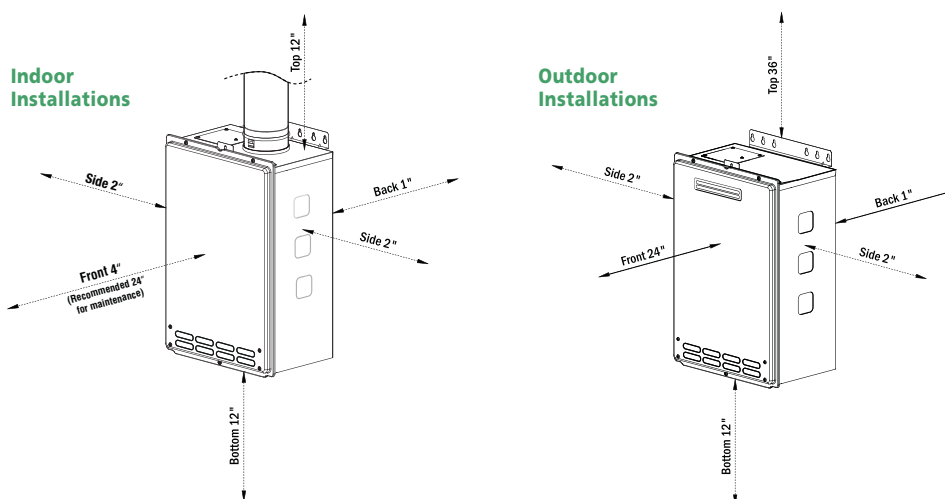


310: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces

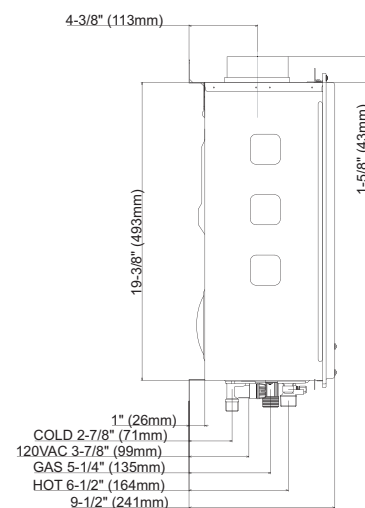
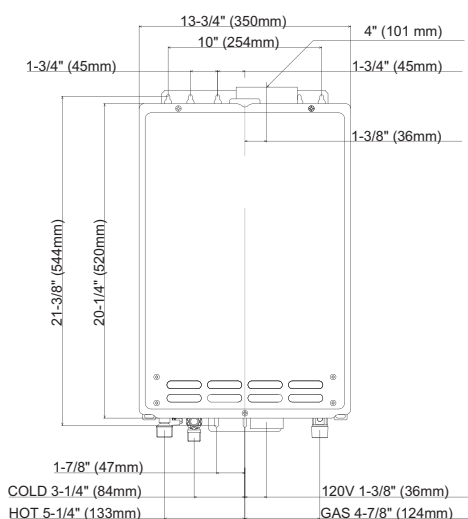


510 Series

The 510 series is well suited for residential/commercial applications such as small restaurants and beauty salons. Utilizing HRS35 copper alloy for the heat exchanger tubing, the 510 series is also suitable for heavier-residential usages such as space heating or domestic recirculation systems. Remote control included as a standard feature.



Dimensions



Specifications

Thicker heat exchanger drum and utilizes HRS (heat-resistant) copper for the heat exchanger tubing. Provides a variety of installation options: indoor, outdoor, and direct vent. Includes a pump control port, ensuring efficient operation of all circulation pumps. Easy-Link System capable up to 4 units.

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

Commercial Use:

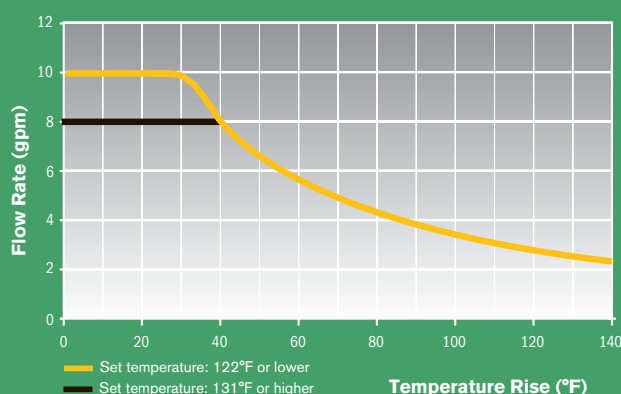
10 yrs limited heat exchanger, 5 yrs limited parts

**Refer to www.hotwater.com for further warranty details.

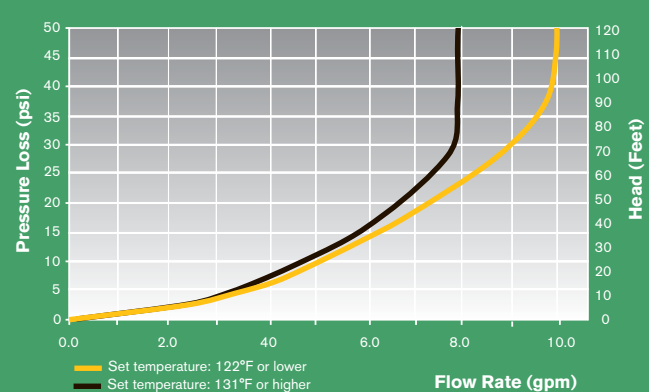
ATI-510 includes both a remote control and power cord as standard features

Installation Type	Indoor, Outdoor, Direct Vent								
Dimension	20-1/4" (H) X 13-3/4" (W) X 9-1/2" (D) , Weight :39 lbs								
Electric	120 V	0.77 A (Operation)	0.052 A (Standby)	0.93 A (Freeze-Protection)					
Ignition	Electronic Ignition								
Noise Level	55 dB at Max output								
Fuel		NG	LP						
Gas Consumption	Min. Input	11,000 BTU/h	11,000 BTU/h						
	Max. Input	199,000 BTU/h	199,000 BTU/h						
Energy Factor		0.82	0.82						
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.						
		Max 10.5" W.C.	Max 14.0" W.C.						
Flow Rate	10.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition							
Hot/Cold/Gas Connection	3/4" NPT								
Coil Capacity	≈0.2 Gallons								
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow							
Multiple Unit Installation	Easy-Link System	Up to 4 units	With no need for a system controller						
	Multi-Unit System	N/A	N/A						
510 Temperature Settings	Dipswitches	104°F	113°F	122°F (default)	131°F	140°F	158°F	176°F	185°F
	With 9007603005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)								
	99°F to 185°F (19 options), 122°F Default Factory Setting								

510: Flow Rate vs. Temperature Rise

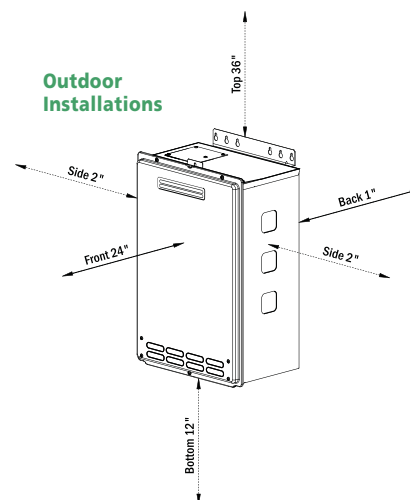
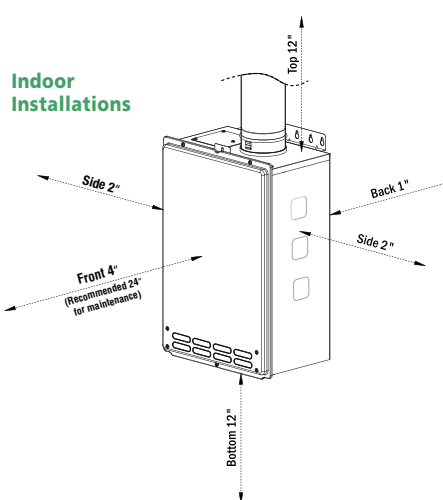


510: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces



110U Series

The 110U Series is great for apartments, one bath homes in cold climates, condos and summer cabins. Remote control included as a standard feature. Complies with Ultra-Low NOx regulations.



ATI-110U

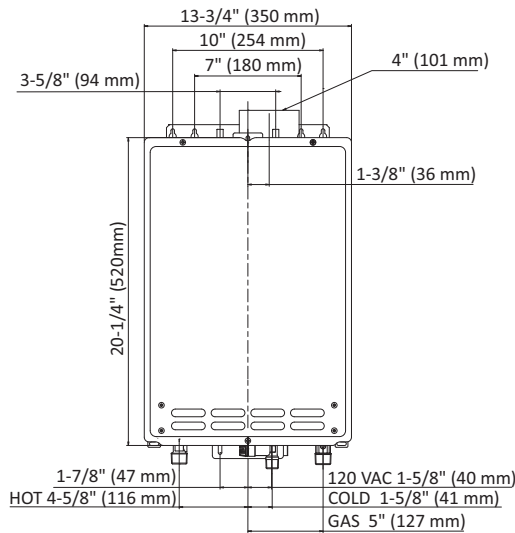


ATO-110U

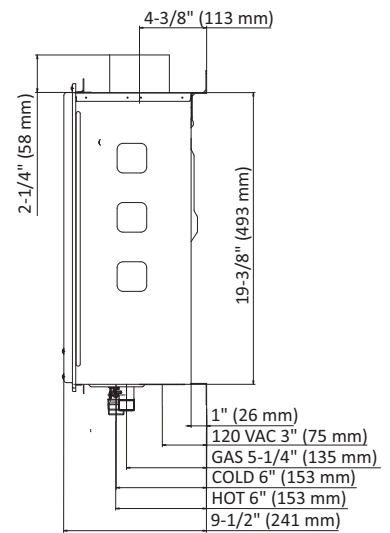


Dimensions

Front view



Side view



Specifications

Provides a variety of installation options: indoor, outdoor, and direct vent. Complies with Ultra-Low NOx regulations. Meets the energy efficiency requirements of ASHRAE 90.1b-1992.

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

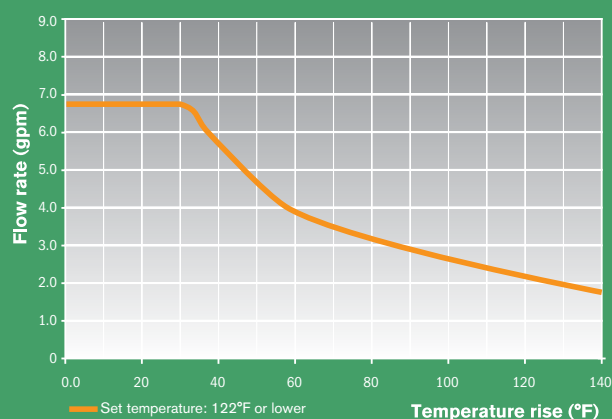
**Refer to www.hotwater.com for further warranty details.

Indoor models include both a remote control and power cord as standard features

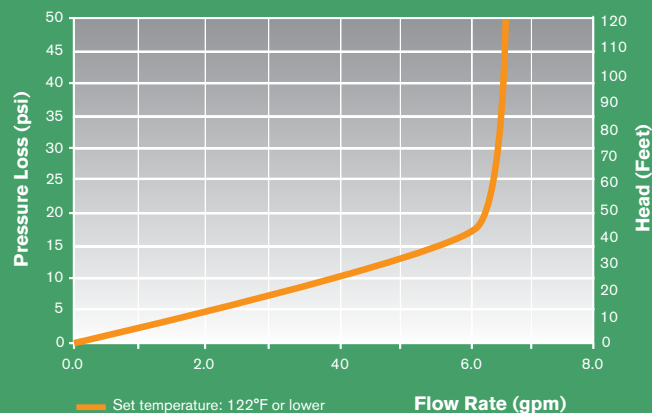
Outdoor models include remote control as a standard feature

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	20-1/4" (H) X 13-3/4" (W) X 9-1/2" (D) , Weight :33 lbs			
Electric	120 V	0.77 A (Operation)	0.052 A (Standby)	0.93 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG		
Gas Consumption	Min. Input	15,000 BTU/h		
	Max. Input	140,000 BTU/h		
Energy Factor		0.82		
Gas Pressure		Min 5.0" W.C. Max 10.5" W.C.		
Flow Rate	6.6 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	N/A	N/A	
	Multi-Unit System	N/A	N/A	
110U Temperature Settings	Dipswitches	120°F (default) 140°F		
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	100°F to 140°F (9 options), 120°F Default Factory Setting			

110U: Flow Rate vs. Temperature Rise



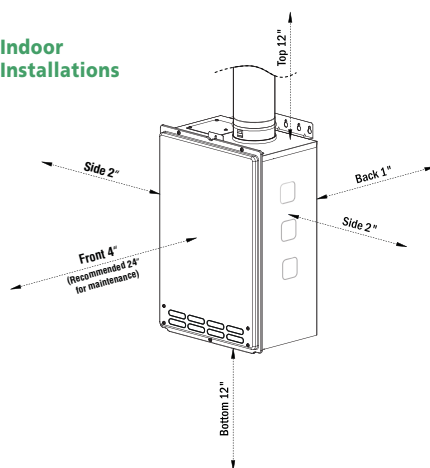
110U: Pressure Loss



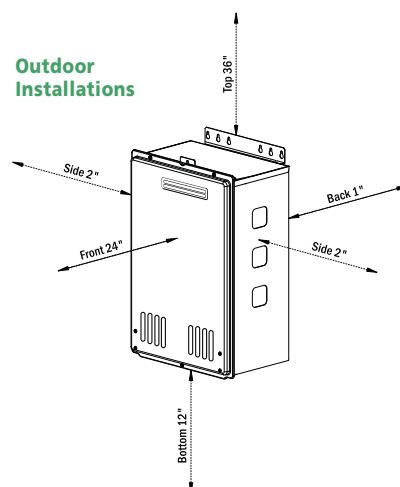
Clearance

Clearances to Combustible and Non-Combustible Surfaces

Indoor Installations



Outdoor Installations

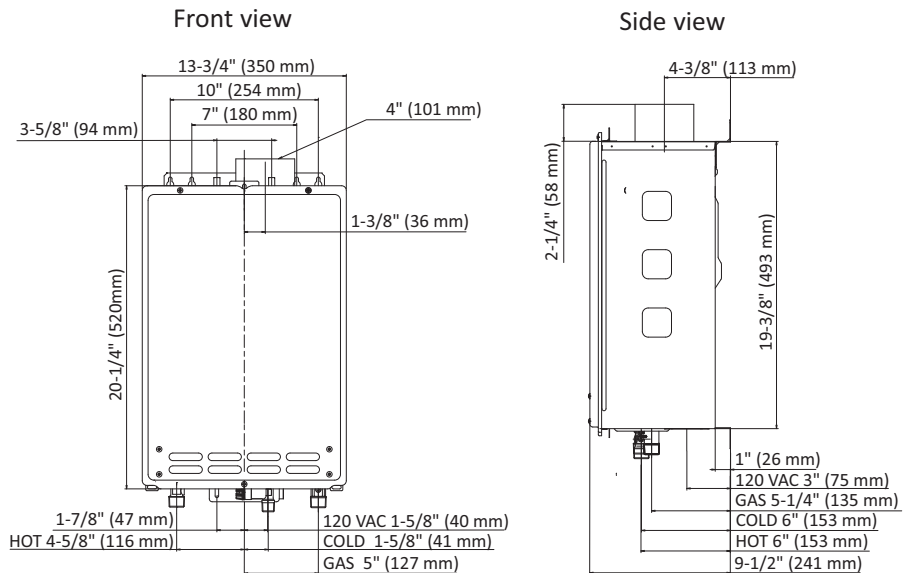


310U Series

The 310U features a max flow rate of 8.0 gpm providing enough hot water to run three showers at the same time. Remote control included as a standard feature. Complies with Ultra-Low NOx regulations.



Dimensions



Specifications

Provides a variety of installation options: indoor, outdoor, and direct vent. Complies with Ultra-Low NOx regulations. Meets energy efficiency requirements of ASHRAE 90.1b-1992.

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

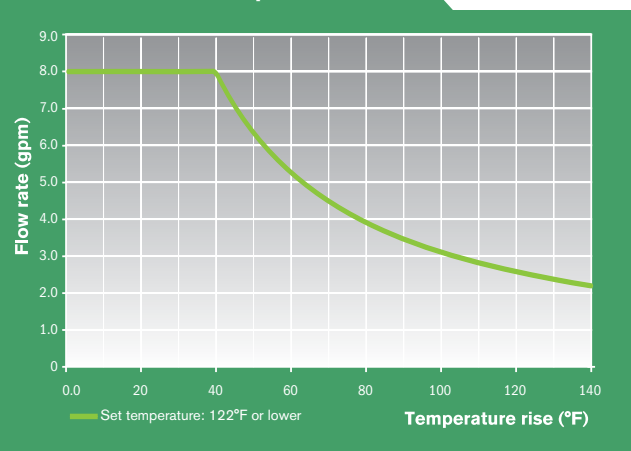
**Refer to www.hotwater.com for further warranty details.

Indoor models include both a remote control and power cord as standard features

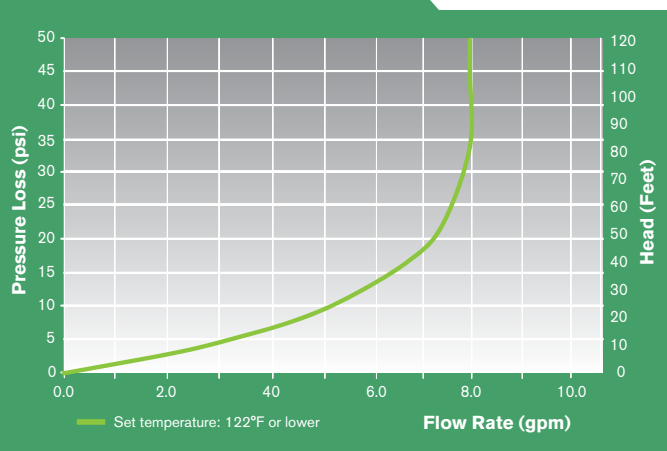
Outdoor models include remote control as a standard feature

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	20-1/4" (H) X 13-3/4" (W) X 9-1/2" (D) , Weight :37 lbs			
Electric	120 V	0.73 A (Operation)	0.052 A (Standby)	0.93 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG		
Gas Consumption	Min. Input	15,000 BTU/h		
	Max. Input	190,000 BTU/h		
Energy Factor		0.82		
Gas Pressure		Min 5.0" W.C.		
		Max 10.5" W.C.		
Flow Rate	8.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	N/A	N/A	
	Multi-Unit System	N/A	N/A	
310U Temperature Settings	Dipswitches	120°F (default)	140°F	
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	120°F to 140°F (9 options), 120°F Default Factory Setting			

310U: Flow Rate vs. Temperature Rise



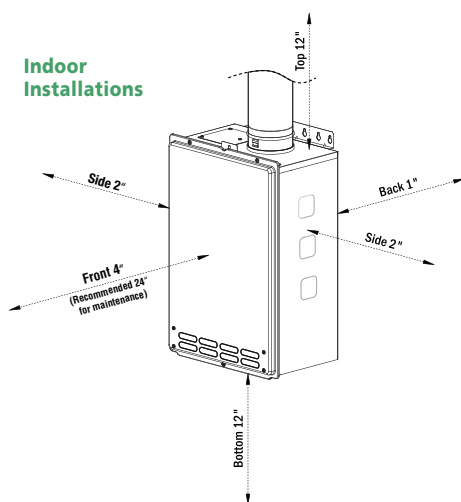
310U: Pressure Loss



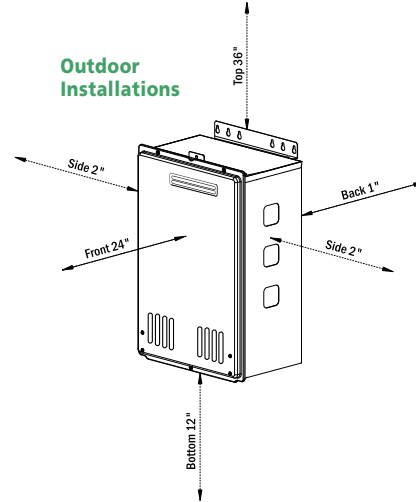
Clearance

Clearances to Combustible and Non-Combustible Surfaces

Indoor Installations



Outdoor Installations

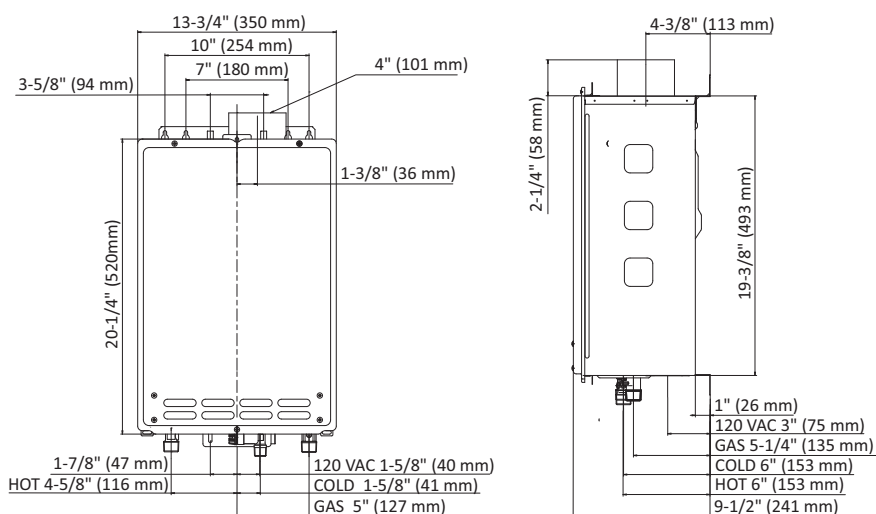


510U Series

The 510U series is well suited for residential/commercial applications such as small restaurants and beauty salons. Utilizing HRS35 copper alloy for the heat exchanger tubing, the 510U series is also suitable for heavier-residential usages such as space heating or domestic recirculation systems. Remote control included as a standard feature.



Dimensions



Specifications

Thicker heat exchanger drum and utilizes HRS (heat-resistant) copper for the heat exchanger tubing. Provides a variety of installation options: indoor, outdoor, and direct vent. Includes a pump control port, ensuring efficient operation of all circulation pumps. Complies with Ultra-Low NOx regulations. Meets the energy efficiency requirements of ASHRAE 90.1-b 1992. Easy-Link System capable up to 4 units. Multi-Link system capable up to 20 units.

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

Commercial Use:

10 yrs limited heat exchanger, 5 yrs limited parts

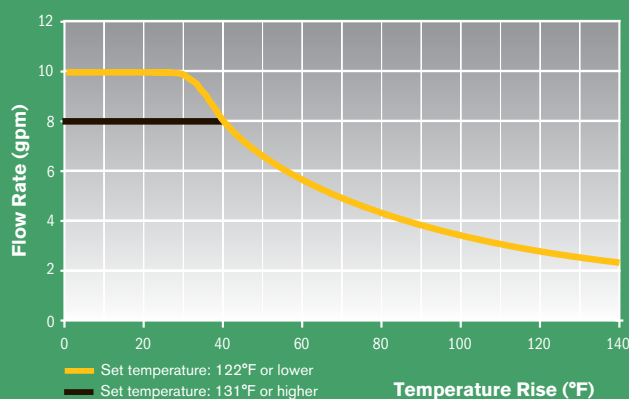
**Refer to www.hotwater.com for further warranty details.

Indoor models include both a remote control and power cord as standard features

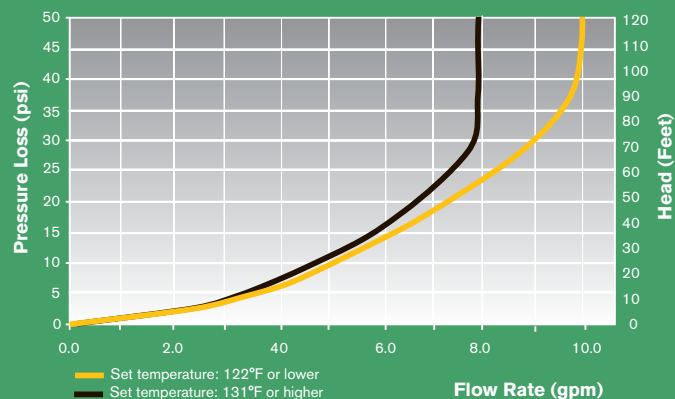
Outdoor models include remote control as a standard feature

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	20-1/4" (H) X 13-3/4" (W) X 9-1/2" (D) , Weight :39 lbs			
Electric	120 V	0.77 A (Operation)	0.052 A (Standby)	0.93 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG		
Gas Consumption	Min. Input	15,000 BTU/h		
	Max. Input	199,000 BTU/h		
Energy Factor		0.82		
Gas Pressure		Min 5.0" W.C. Max 10.5" W.C.		
Flow Rate	10.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	Up to 4 units	With no need for a system controller	
	Multi-Unit System	Up to 20 units	Multi-Controller (9008300005)	
510U Temperature Settings	Dipswitches	120°F (default)	140°F	
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	100°F to 185°F (16 options), 120°F Default Factory Setting			

510U: Flow Rate vs. Temperature Rise



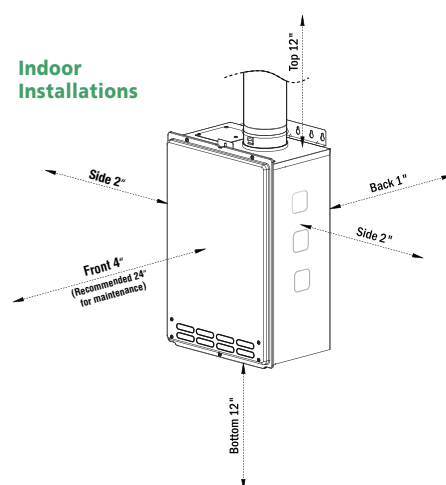
510U: Pressure Loss



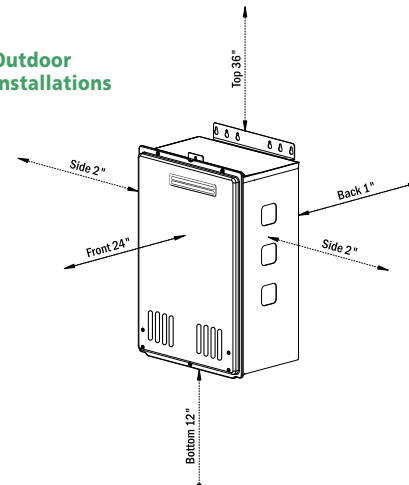
Clearance

Clearances to Combustible and Non-Combustible Surfaces

Indoor Installations

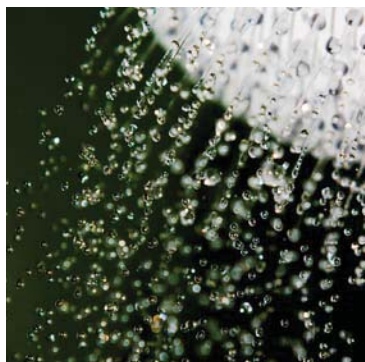


Outdoor Installations



140H Series

The 140H Series is a high efficient, ultra-low NOx condensing model with a .93 Energy Factor, allowing for the use of 3 or 4" PVC venting or Category III Stainless Steel.



ATI-140H

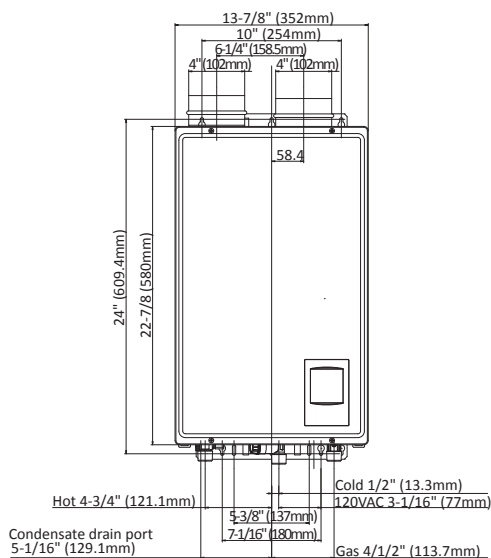


ATO-140H

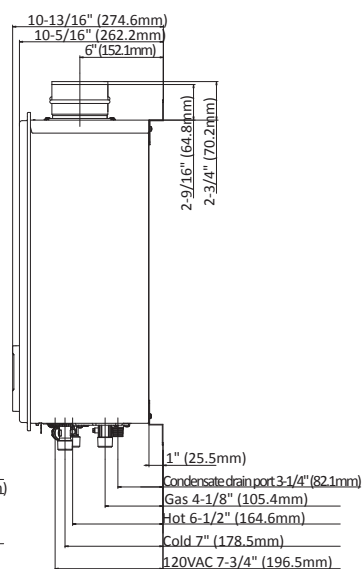


Dimensions

Front view



Side view



Specifications

Provides a variety of installation options: indoor, outdoor, and power direct vent design. Complies with California's Ultra-Low NOx emission requirements of 14 ng/J or 20 ppm.

Warranty Information**

Residential Use:

15 years limited heat exchanger, 5 yrs limited parts

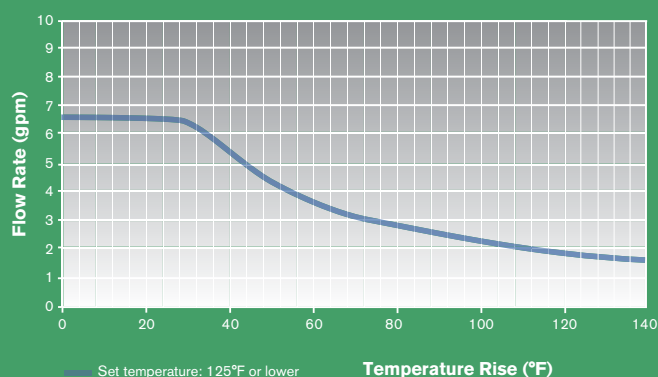
**Refer to www.hotwater.com for further warranty details.

Indoor model includes a built-in temperature controller and advanced diagnostics to simplify troubleshooting.

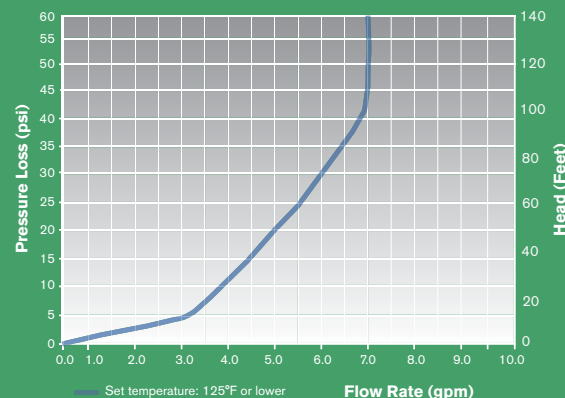
Outdoor model includes a wall mount temperature remote controller and advanced diagnostics for troubleshooting.

Installation Type	Indoor, Outdoor, SCH 40 PVC Direct Vent or Category III Stainless Steel									
Dimension	22-7/8" (H) X 13-7/8" (W) X 10-3/4" (D) , Weight :DV: 44 lbs OS: 44 lbs									
Electric	120 V	1.27 A (Operation)	0.07 A (Standby)	1.73 A (Freeze-Protection)						
Ignition	Electronic Ignition									
Noise Level	55 dB at Max output									
Fuel		NG	LP							
Gas Consumption	Min. Input	15,000 BTU/h	15,000 BTU/h							
	Max. Input	120,000 BTU/h	120,000 BTU/h							
Energy Factor		0.93	0.93							
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.							
		Max 10.5" W.C.	Max 14.0" W.C.							
Flow Rate	6.6 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition								
Hot/Cold Connection	3/4" NPT									
Gas Connection	1/2" NPT									
Coil Capacity	≈0.2 Gallons									
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI).								
		40 psi or above recommended for max. flow								
Multiple Unit Installation	Easy-Link System	N/A		N/A						
	Multi-Unit System	N/A		N/A						
140H Temperature Settings	Built In / without remote	100°F	105°F	110°F	115°F	120°F (Default)	125°F	130°F	135°F	140°F
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)									
	100°F to 140°F (9 options), 120°F Default Factory Setting									

140H: Flow Rate vs. Temperature Rise



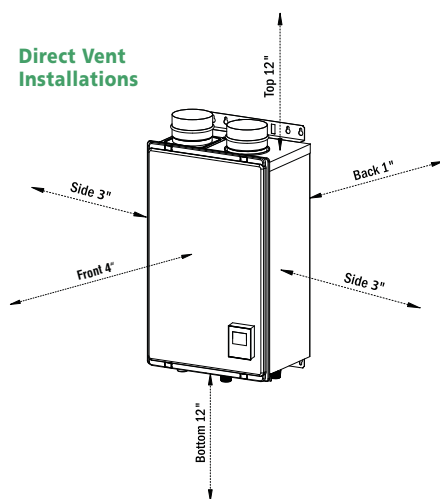
140H: Pressure Loss



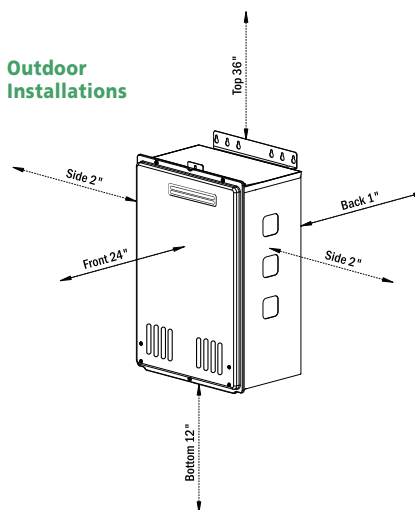
Clearance

Clearances to Combustible and Non-Combustible Surfaces

Direct Vent Installations

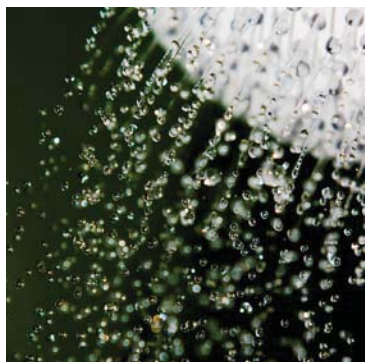


Outdoor Installations

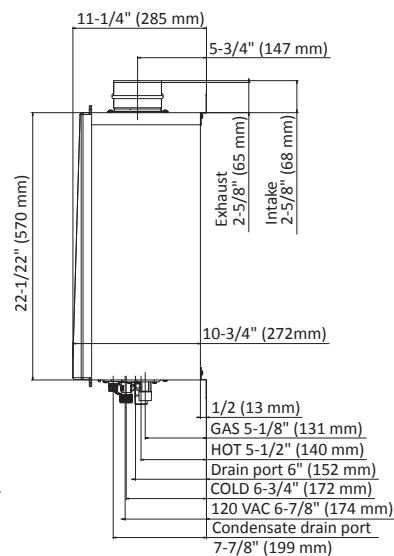
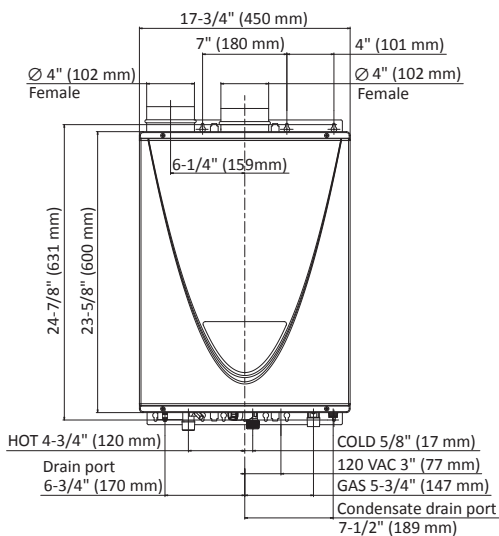


240H Series

The 240H series offers high efficiency Ultra-Low NOx condensing technology allowing for the use of 3" PVC venting and has 0" clearance to combustibles. Utilizes HRS35 copper alloy for the heat exchanger tubing. Remote control included as a standard feature. Indoor models are certified up to 10,100 ft. altitude.



Dimensions



Specifications

Provides a variety of installation options: indoor, outdoor, and direct vent. Complies with Ultra-Low NO_x regulations. Meets the energy efficiency requirements of ASHRAE 90.1b-1992.

Warranty Information**

Residential Use:

15 years limited heat exchanger, 5 yrs limited parts

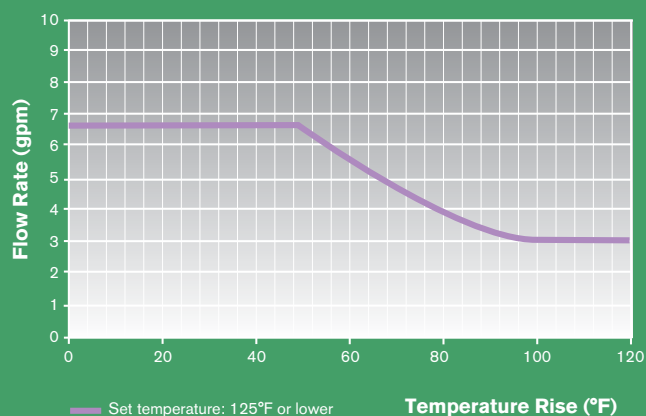
**Refer to www.hotwater.com for further warranty details.

Indoor model includes a built-in temperature controller and advanced diagnostics to simplify troubleshooting.

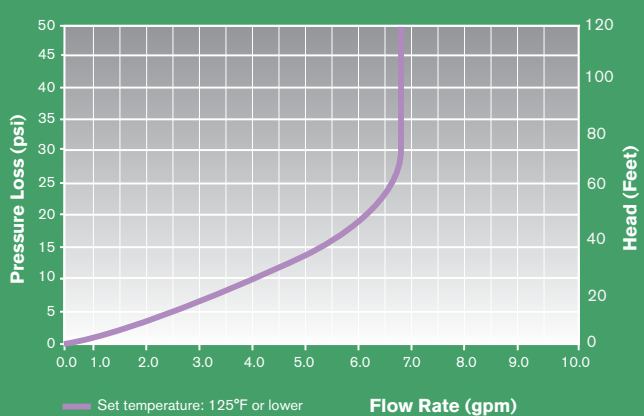
Outdoor model includes a wall mount temperature remote controller and advanced diagnostics to simplify troubleshooting.

Installation Type	Indoor, Outdoor, SCH 40 PVC Direct Vent			
Dimension	23-5/8" (H) X 17-3/4" (W) X 11-1/4" (D) , Weight :DV: 58 lbs OS: 58 lbs			
Electric	120 V	1.27 A (Operation)	0.07 A (Standby)	1.73 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	15,000 BTU/h	13,000 BTU/h	
	Max. Input	160,000 BTU/h	160,000 BTU/h	
Energy Factor		0.95	0.95	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	6.6 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	N/A	N/A	
	Multi-Unit System	N/A	N/A	
240H Temperature Settings	Built In / without remote	100°F 105°F 110°F 115°F 120°F (Default) 125°F 130°F 135°F 140°F (9 options)		
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	100°F to 140°F with 5°F intervals (9 options), 120°F Default Factory Setting			

240H: Flow Rate vs. Temperature Rise

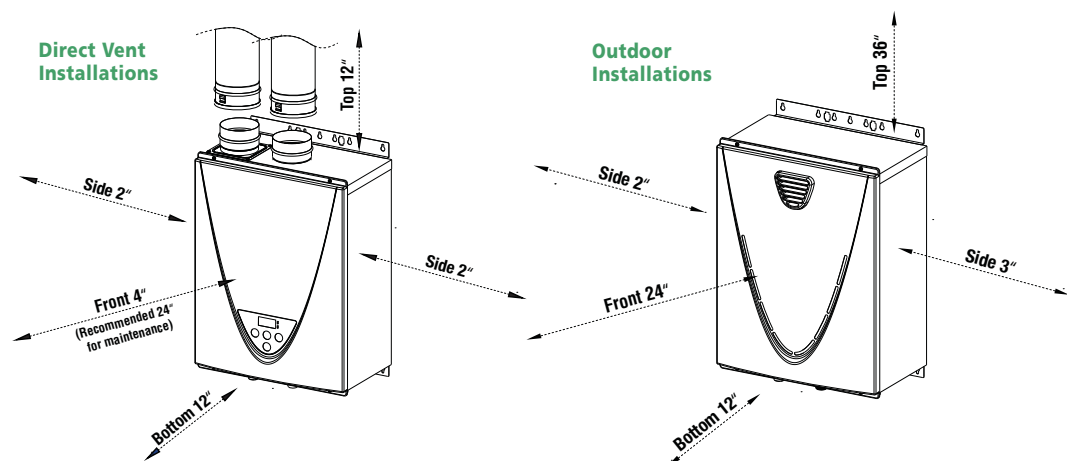


240H: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces

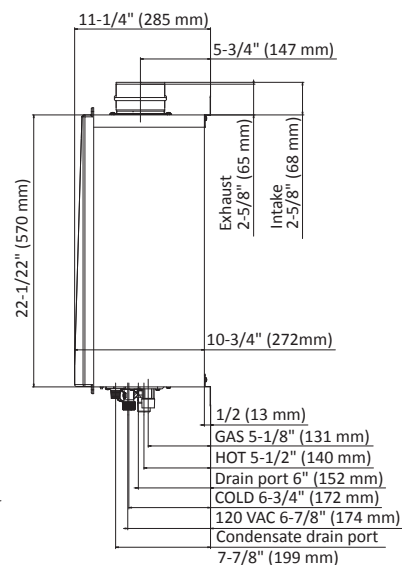
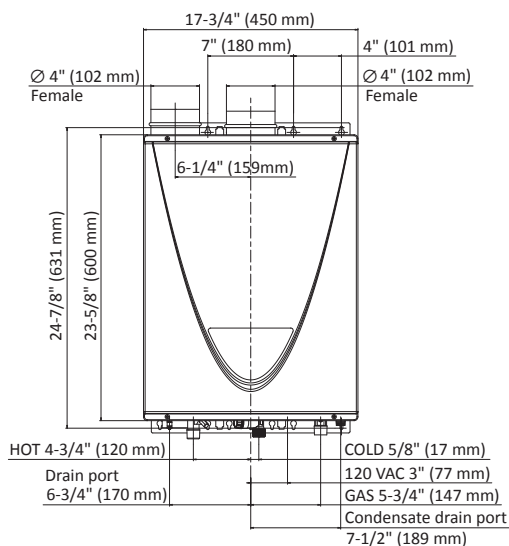


340H Series

The 340H series offers high efficiency Ultra-Low NOx condensing technology allowing for the use of 3" PVC venting and has 0" clearance to combustibles. Utilizes HRS35 copper alloy for the heat exchanger tubing. Remote control included as a standard feature. Indoor models are certified up to 10,100 ft. altitude.



Dimensions



Specifications

Provides a variety of installation options: indoor, outdoor, and direct vent. Complies with Ultra-Low NO_x regulations. Meets the energy efficiency requirements of ASHRAE 90.1b-1992.

Warranty Information**

Residential Use:

15 years limited heat exchanger, 5 yrs limited parts

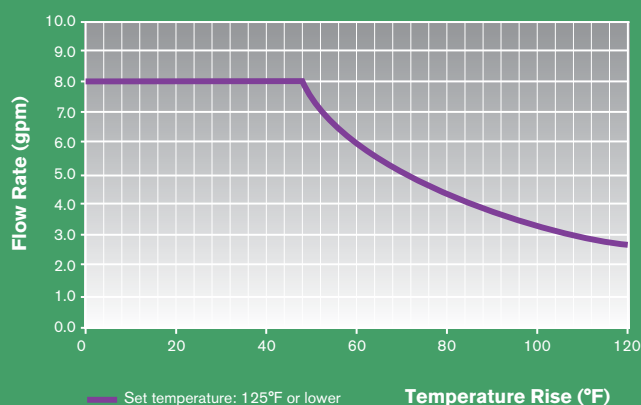
**Refer to www.hotwater.com for further warranty details.

Indoor model includes a built-in temperature controller and advanced diagnostics to simplify troubleshooting.

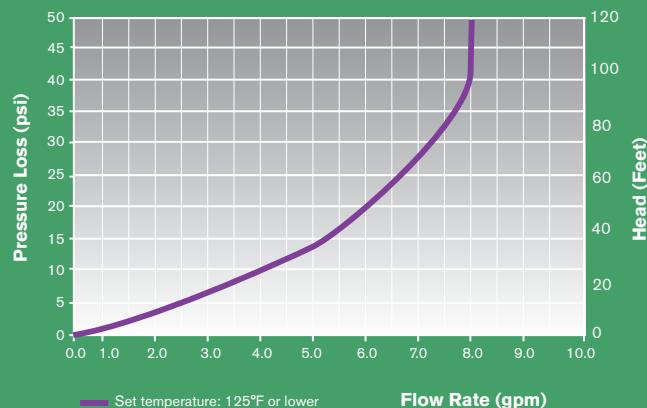
Outdoor model includes a wall mount temperature remote controller and advanced diagnostics to simplify troubleshooting.

Installation Type	Indoor, Outdoor, SCH 40 PVC Direct Vent			
Dimension	23-5/8" (H) X 17-3/4" (W) X 11-1/4" (D) , Weight :DV: 58 lbs OS: 58 lbs			
Electric	120 V	1.27 A (Operation)	0.07 A (Standby)	1.73 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	15,000 BTU/h	13,000 BTU/h	
	Max. Input	180,000 BTU/h	180,000 BTU/h	
Energy Factor		0.95	0.95	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	8.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	N/A	N/A	
	Multi-Unit System	N/A	N/A	
340H Temperature Settings	Built In / without remote	100°F 105°F 110°F 115°F 120°F (Default) 125°F 130°F 135°F 140°F (9 options)		
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	100°F to 140°F with 5°F intervals (9 options), 120°F Default Factory Setting			

340H: Flow Rate vs. Temperature Rise

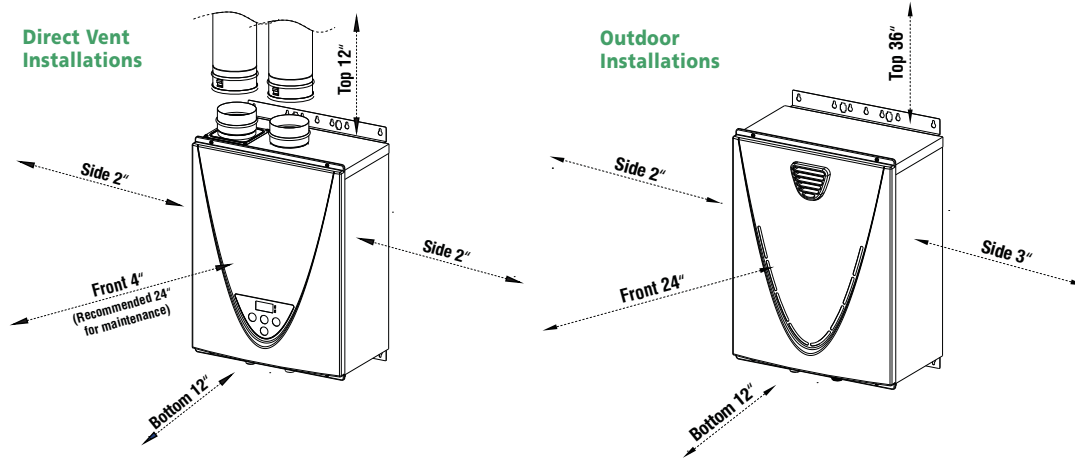


340H: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces

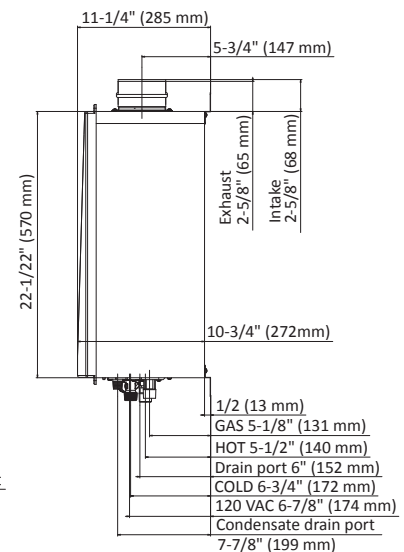
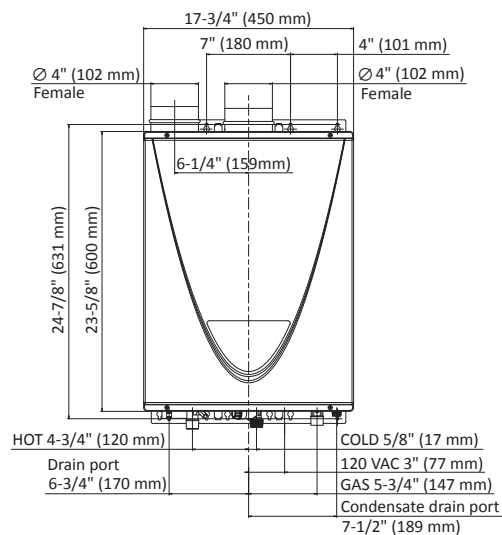


540H Series

The 540H is well suited for residential/commercial applications such as small restaurants and beauty salons. Complies with Ultra-Low NOx regulations. Utilizing HRS35 copper alloy for the heat exchanger tubing, the 540H is also suitable for heavier-residential usages such as space heating or domestic recirculation systems. Remote control included as a standard feature. Indoor models are certified up to 10,100 ft. altitude.



Dimensions



Specifications

Thicker heat exchanger drum and utilizes HRS35 (heat-resistant) copper for the heat exchanger tubing. Provides a variety of installation options: outdoor, and direct vent. Includes a pump control port, ensuring efficient operation of all circulation pumps. Complies with Ultra-Low NOx regulations. Meets the energy efficiency requirements of ASHRAE 90.1b-1992. Easy-Link System capable up to 4 units. Multi-Link System capable up to 20 units.

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

Commercial Use:

10 yrs limited heat exchanger, 5 yrs limited parts

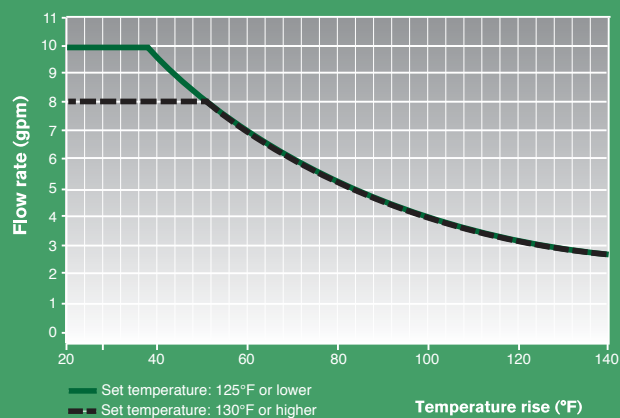
** Refer to www.hotwater.com for further warranty details.

Indoor model includes a built-in temperature controller and advanced diagnostics to simplify troubleshooting.

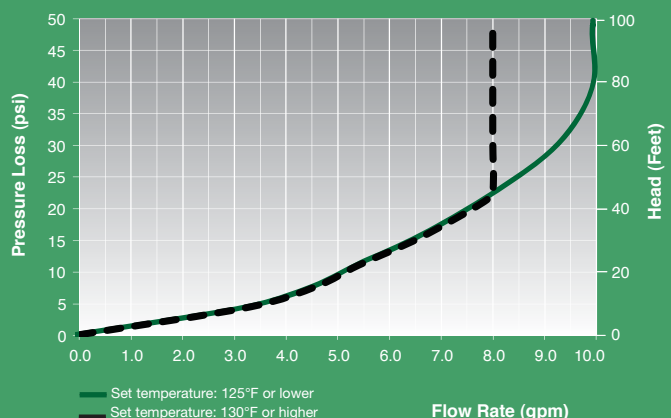
Outdoor models includes a wall mount temperature remote controller and advanced diagnostics to simplify troubleshooting.

Installation Type	Indoor, Outdoor, SCH 40 PVC Direct Vent			
Dimension	23-5/8" (H) X 17-3/4" (W) X 11-1/4" (D) , Weight :DV: 59 lbs OS:59 lbs			
Electric	120 V	1.27 A (Operation)	0.07 A (Standby)	1.73 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	55 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	15,000 BTU/h	13,000 BTU/h	
	Max. Input	199,000 BTU/h	199,000 BTU/h	
Energy Factor		0.95	0.95	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	10.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.2 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 200,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	Up to 4 units	With no additional parts or accessories needed	
	Multi-Unit System	Up to 20 units	Multiple-Unit Controller 9008300005	
540H Temperature Settings	Built In / without remote	100°F 105°F 110°F 115°F 120°F (Default) 125°F 130°F 135°F 140°F 145°F 150°F 155°F 160°F 165°F 170°F 175°F and 185°F (17 options)		
	With 9008172005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring.)			
	100°F to 185°F with 5°F intervals (16 options), 120°F Default Factory Setting			

540H: Flow Rate vs. Temperature Rise

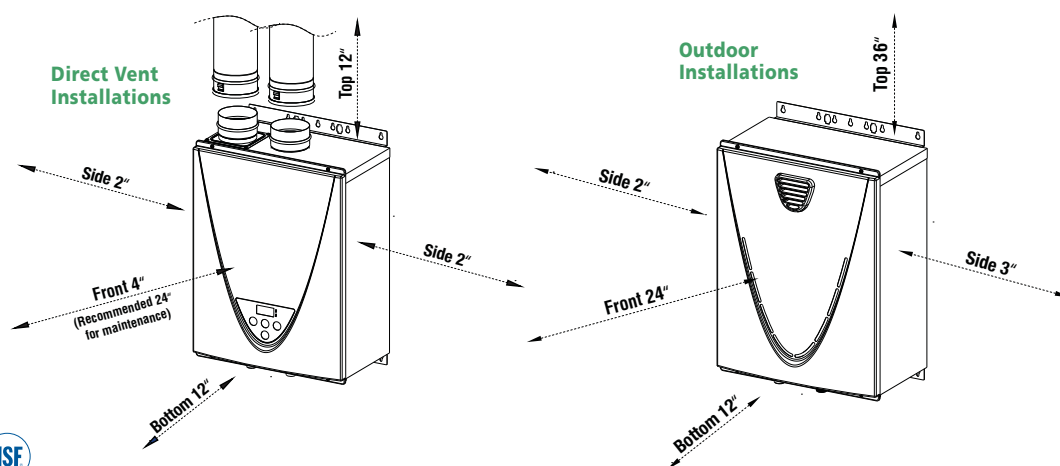


540H: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces



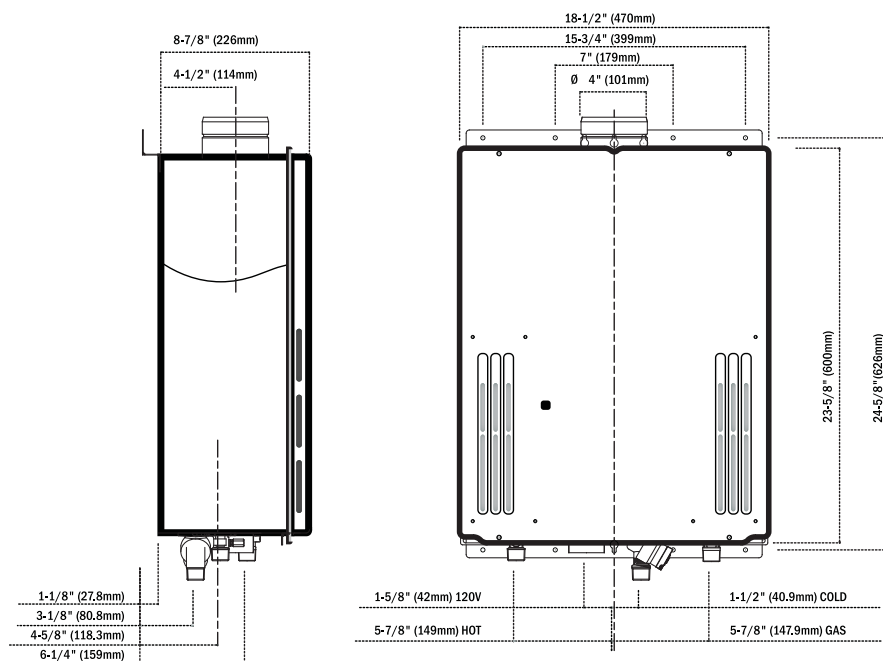
710 Series

Commercial

The 710 Series is specifically designed for commercial applications and shares many of the same commercial-grade attributes as the 910 Series. Though it was designed as a smaller, lighter, and less powerful unit than the 910 Series, it provides the versatility of being able to link up to 20 units in a Multi-Unit System.



Dimensions



Specifications

Thicker heat-exchanger drum and utilizes HRS35 copper alloy for the heat exchanger tubing. Provides a variety of installation options. Adjustments can be made for higher-altitude installations. Includes an internal pump control port. Easy-Link system capable up to 4 units. Multi-Unit System capable up to 20 units. An ASME version of the 710 Series is also available.*

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

Commercial Use:

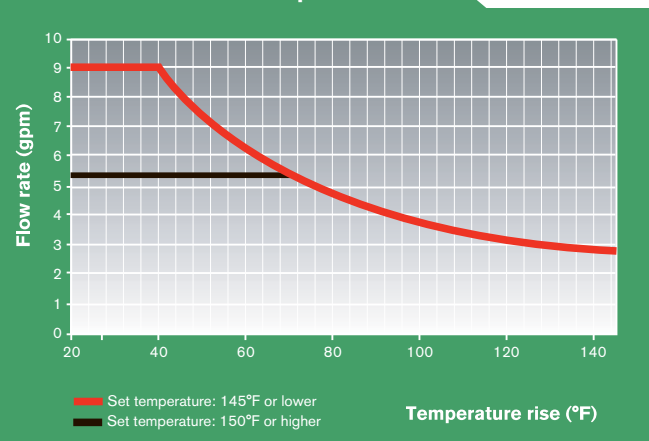
10 yrs limited heat exchanger, 5 yrs limited parts

*ASME models do not utilize HRS35 copper alloy.

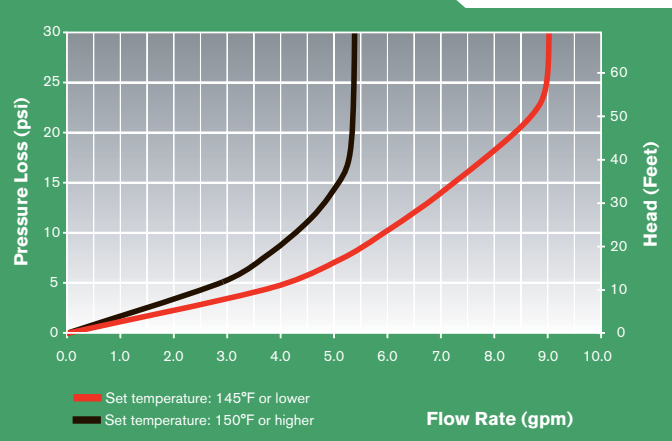
**Refer to www.hotwater.com for further warranty details.

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	23-5/8" (H) X 18-1/2" (W) X 10" (D), Weight : 59 lbs			
Electric	120 V	0.94 A (Operation)	0.075 A (Standby)	1.56 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	56 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	24,000 BTU/h	24,000 BTU/h	
	Max. Output	240,000 BTU/h	240,000 BTU/h	
Thermal Efficiency		82.2%	83.9%	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	9.0 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition.		
Hot/Cold/Gas Connection	3/4" NPT			
Coil Capacity	≈0.32 Gallons			
Water Pressure	15-150 PSI	Pressure-only relief valve required (min. 240,000 BTU/h, 150 psi) 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	Up to 4 units	With no need for a system controller	
	Multi-Unit System	Up to 20 units	With 9007675005 (Multiple Unit System Controller)	
ATIO-710 Temperature Settings	Dipswitches	100°F 115°F 120°F (default) 135°F 145°F 155°F 165°F 185°F		
	With 9007603005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring)			
	Default Mode	100°F 105°F 110°F 115°F 120°F (default) 125°F 130°F 135°F 140°F 145°F 150°F 155°F 160°F 165°F 170°F 175°F		
	High Temp. Mode	110°F 115°F 120°F (default) 125°F 130°F 135°F 140°F 145°F 150°F 155°F 160°F 165°F 170°F 175°F 180°F 185°F		

ATIO-710: Flow Rate vs. Temperature Rise

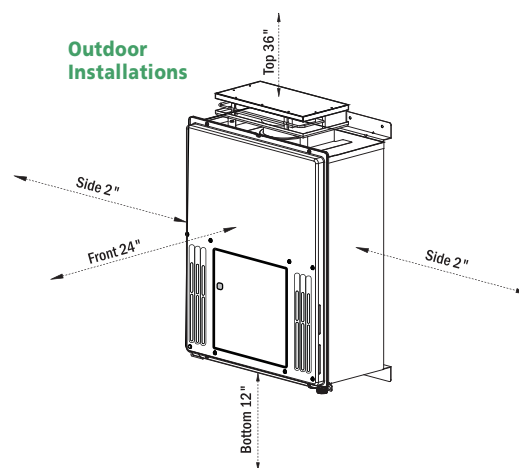
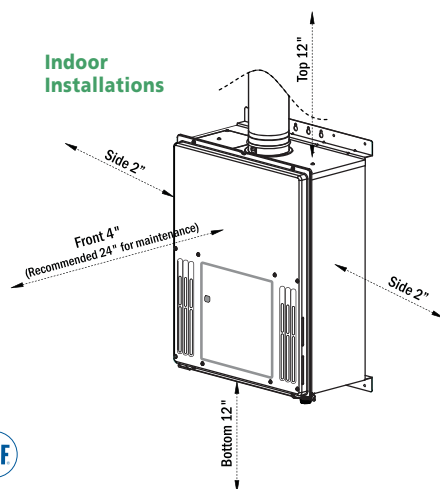


ATIO-710: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces

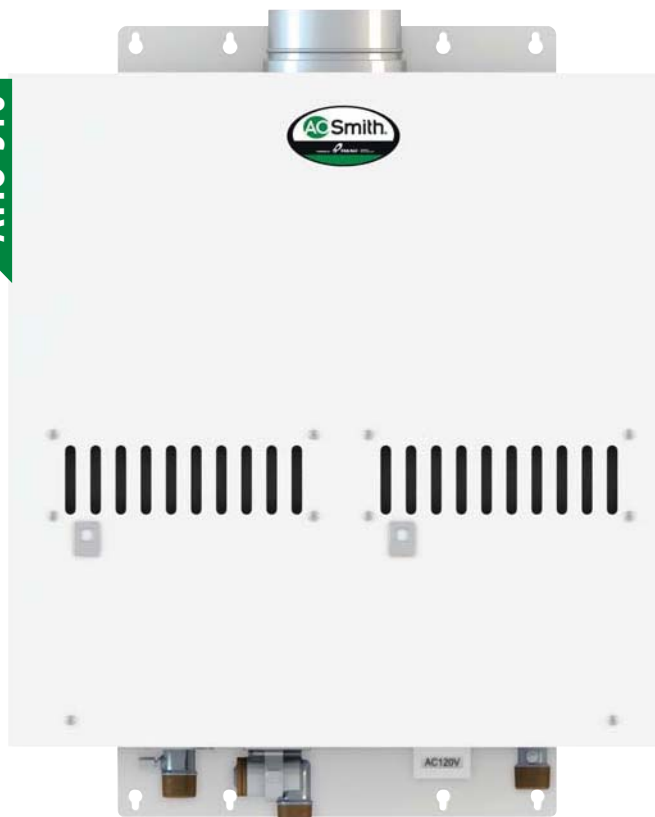


910 Series

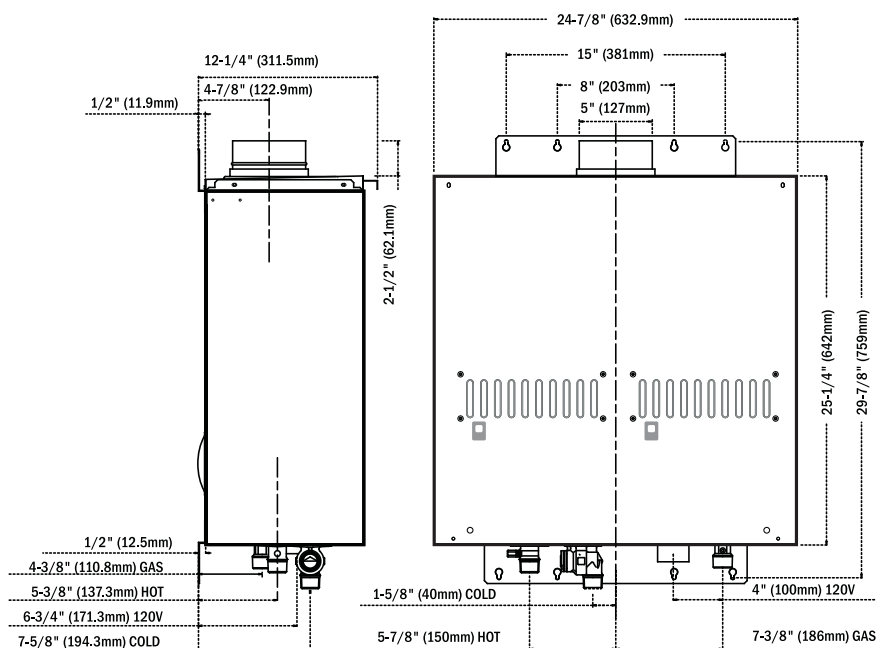
The 910 Series, specifically designed for heavy-duty applications, is the largest A. O. Smith tankless heater yet, and the most powerful (14.5 GPM max) in the tankless industry! The 910 Series is suitable for commercial applications (hotels, restaurants, government, convalescent homes, etc.) that require high demand and the most durable of heaters. Along with HRS35 copper alloy, the 910 Series is the only commercial unit in the industry that offers a "dual-combustion system," providing redundancy for added reliability.



AT10-910



Dimensions



Specifications

Thicker heat exchanger drum and utilizes HRS35 (heat-resistant) copper for the heat exchanger tubing. Incorporates a dual system for redundancy, providing added assurance that the 910 Series will remain operational. Includes an internal pump control port. Easy-Link System capable up to 4 units. Multi-Unit System capable up to 10 units. An ASME version of the 910 Series is also available.*

Warranty Information**

Residential Use:

15 yrs limited heat exchanger, 5 yrs limited parts

Commercial Use:

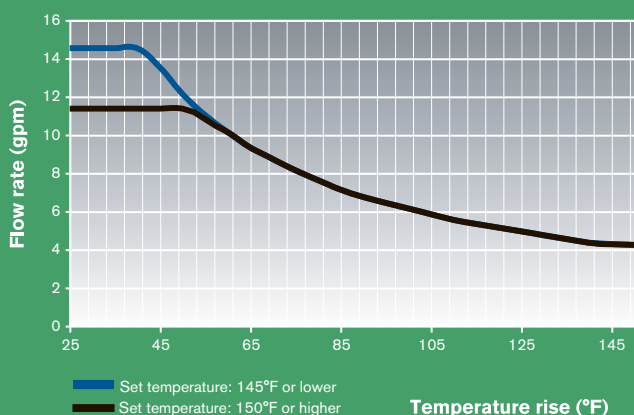
10 yrs limited heat exchanger, 5 yrs limited parts

* ASME models do not utilize HRS35 copper alloy.

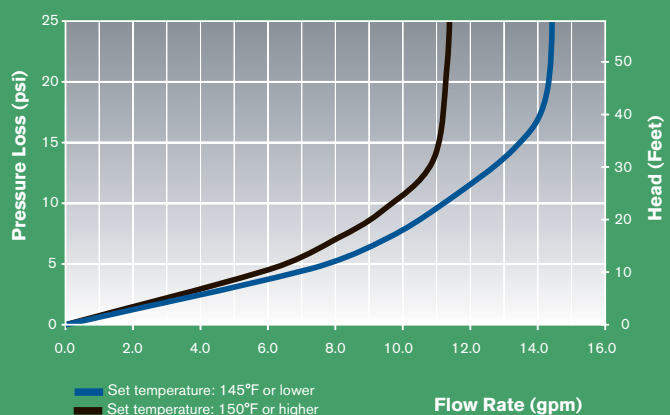
**Refer to www.hotwater.com for further warranty details.

Installation Type	Indoor, Outdoor, Direct Vent			
Dimension	25-1/4" (W) X 24-7/8" (H) X 12-1/4" (D), Weight : 112 lbs			
Electric	120 VAC	1.49 A (Operation)	0.14 A (Standby)	2.26 A (Freeze-Protection)
Ignition	Electronic Ignition			
Noise Level	56 dB at Max output			
Fuel		NG	LP	
Gas Consumption	Min. Input	15,000 BTU/h	15,000 BTU/h	
	Max. Input	380,000 BTU/h	380,000 BTU/h	
Thermal Efficiency		80.2%	82.4%	
Gas Pressure		Min 5.0" W.C.	Min 8.0" W.C.	
		Max 10.5" W.C.	Max 14.0" W.C.	
Flow Rate	14.5 GPM	Values based on factory testing. 0.4 GPM required for continuous fire after initial ignition.		
Hot/Cold/Gas Connection	1" NPT			
Coil Capacity	≈0.32 Gallons			
Water Pressure	15-150 PSI	Pressure Only Relief Valve Requires (Min 380,000 BTUs. 150 PSI). 40 psi or above recommended for max. flow		
Multiple Unit Installation	Easy-Link System	Up to 4 units	With no need for a system controller	
	Multi-Unit System	Up to 10 units	With 9007675005 (Multiple Unit System Controller)	
ATIO-910 Temperature Settings	Dipswitches	100°F 115°F 120°F (default) 135°F 145°F 155°F 165°F 185°F		
	With 9007603005 remote (max. distance 400' from heater, non-polarized 18 gauge wiring)			
	Default Mode	100°F 105°F 110°F 115°F 120°F (default) 125°F 130°F 135°F 140°F 145°F 150°F 155°F 160°F 165°F 170°F 175°F		
	High Temp. Mode	110°F 115°F 120°F (default) 125°F 130°F 135°F 140°F 145°F 150°F 155°F 160°F 165°F 170°F 175°F 180°F 185°F		

ATIO-910: Flow Rate vs. Temperature Rise

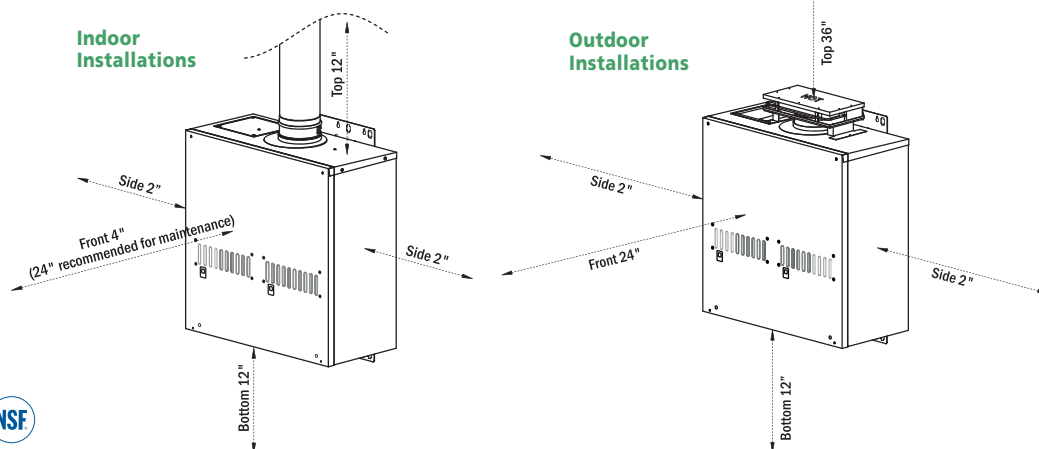


ATIO-910: Pressure Loss



Clearance

Clearances to Combustible and Non-Combustible Surfaces



What A. O. Smith Delivers



EASY-LINK

For larger applications that require multiple water heaters to work in conjunction, all of A. O. Smith's commercial tankless heaters feature the Easy-Link system. This allows installers to easily manifold up to 4 units without the need for a system controller. The controls are already built into each model's internal computer. The Easy-Link system ensures proper modulation, using only the amount of energy required so that there is never any waste. Refer to each model's installation instructions for details.



Multi-Unit System

MULTI- UNIT

For even larger applications, the 510U, 540H, 710 Series and 910 Series models also feature the Multi-Unit system, allowing a greater number of units to manifold together. Use of the Multi-Unit System Controller is needed to enable the Multi-Unit system. The Multi-Unit System can control up to twenty 510U's, 540H's, 710's and ten 910's.



UNIT COMPARISON					
	510 Series	510U* Series	540H* Series	710 Series	910 Series
EASY-LINK (No Controller Necessary)	Up to 4 units	Up to 4 units	Up to 4 units	Up to 4 units	Up to 4 units
Maximum input (BTU/h)	796,000	796,000	796,000	960,000	1,520,000
MULTI-UNIT (with 9007675005 controller)	N/A	Up to 20 units	Up to 20 units	Up to 20 units	Up to 10 units
Maximum input (BTU/h)	N/A	3,980,000	3,980,000	4,800,000	3,800,000

*510U and 540H models use 9008300005 controller for multi-link capabilities

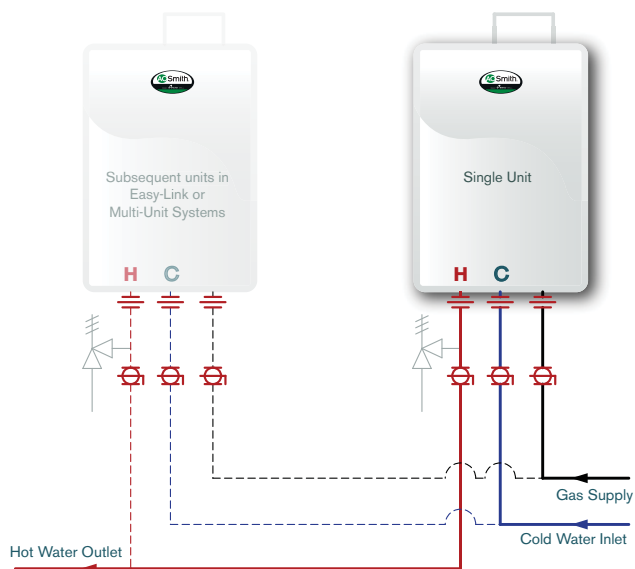


Application Diagrams

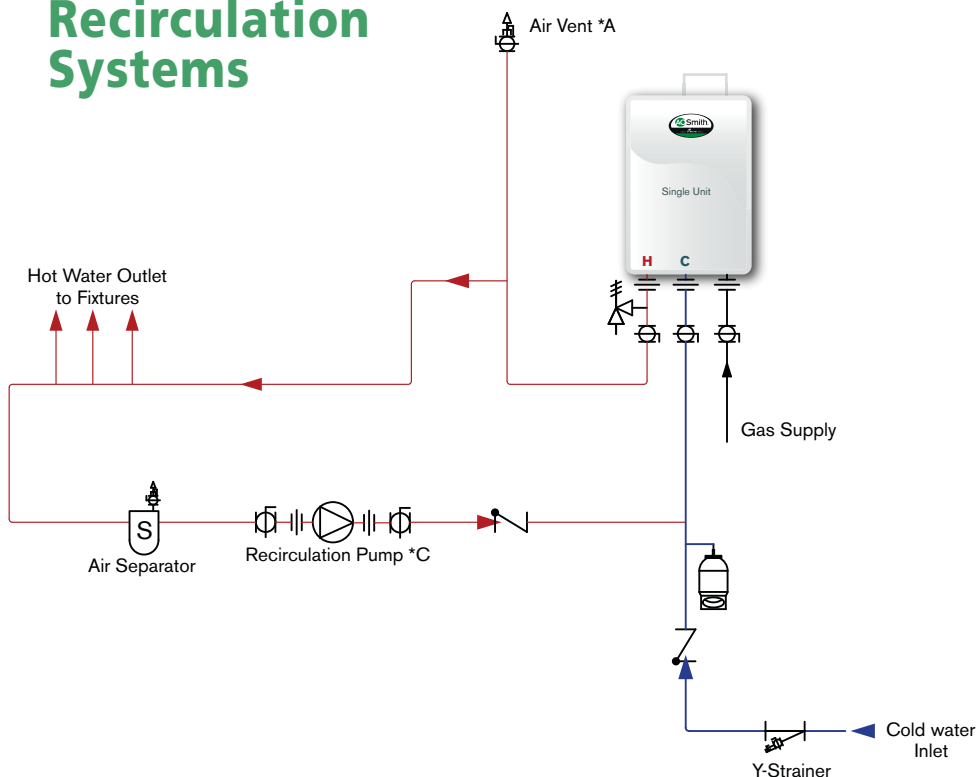
A. O. Smith tankless water heaters can be used in a wide variety of applications. Whether used in recirculation systems, in conjunction with storage tanks, or with heating applications, our commercial units are built to provide endless, continuous hot water.*

*Local codes dictate proper compliance

Basic Installation

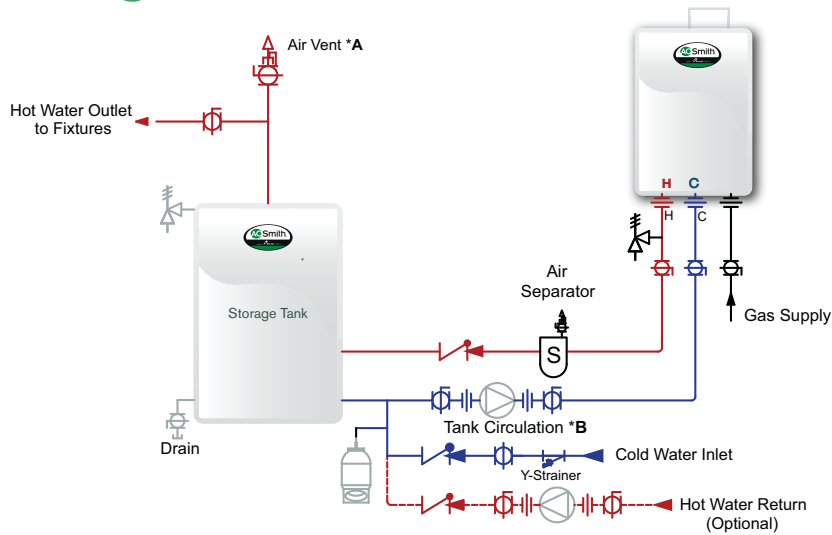


Recirculation Systems



*A. O. Smith tankless water heaters provide endless hot water when sized appropriately for your homes needs.

Storage Tank (3 Tappings)



***A** The air vent is to be installed at the highest location of the system. The diameter of the pipe leading up the air vent is to be no smaller than the piping throughout the system.

***B**

1. The tank circulation pump is to be controlled by:
 - Dual-set aquastat (recommended w/ timer)
 - OR
 - A. O. Smith Pump Control set to "Storage Tank Mode" (if the A. O. Smith model or controller has this function)
2. The tank circulation pump is to provide no less than 2 gpm through each activated A. O. Smith unit in the system. (Exception: no less than 4 gpm through each 910 series)

***C**

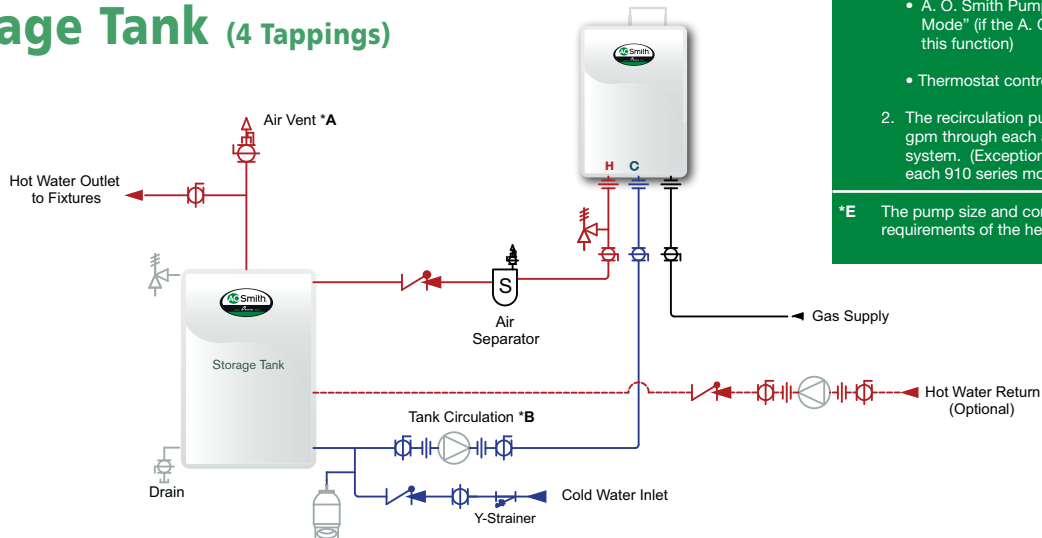
1. The recirculation pump is to be controlled by:
 - Dual-set aquastat (recommended w/ timer)
 - OR
 - A. O. Smith Pump Control set to "Recirculation Mode" (if the A. O. Smith model or controller has this function)
2. The recirculation pump is to provide no less than 2 gpm and no more than 4 gpm through each activated A. O. Smith unit in the system. (Exception: between 4 gpm and 8 gpm through each 910 series)

***D**

1. The recirculation pump is to be controlled by:
 - Dual-set aquastat (recommended w/ timer)
 - OR
 - A. O. Smith Pump Control set to "Recirculation Mode" (if the A. O. Smith model or controller has this function)
 - OR
 - Thermostat controlling the heating application
2. The recirculation pump is to provide no less than 2 gpm through each activated A. O. Smith unit in the system. (Exception: no less than 4 gpm through each 910 series model)

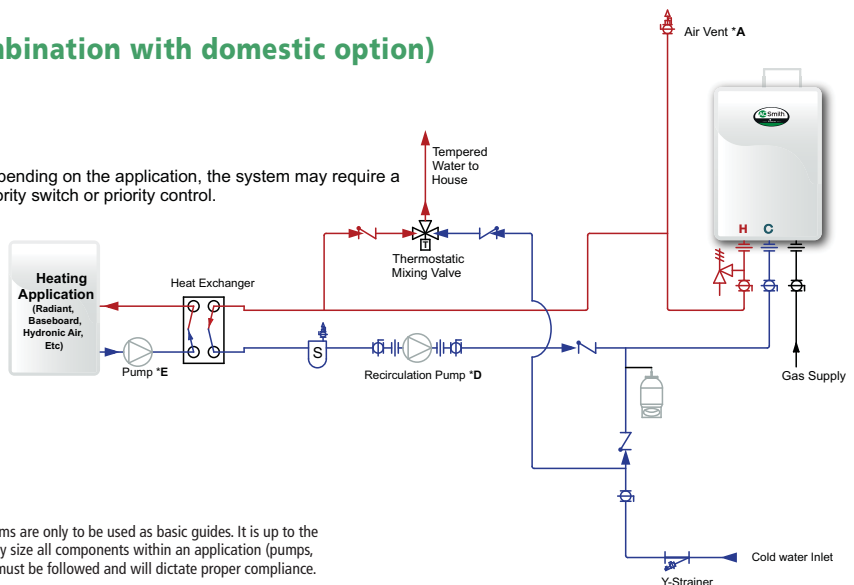
***E** The pump size and control are dependant on the requirements of the heating application.

Storage Tank (4 Tappings)



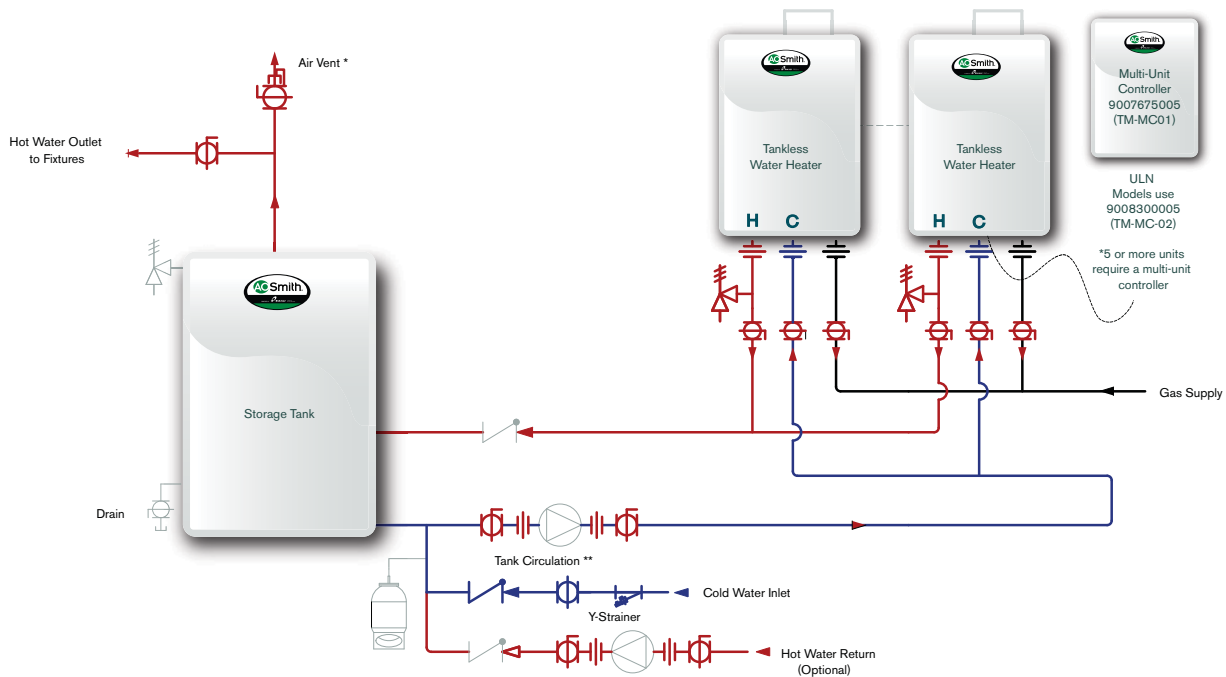
Heating (Combination with domestic option)

Depending on the application, the system may require a priority switch or priority control.

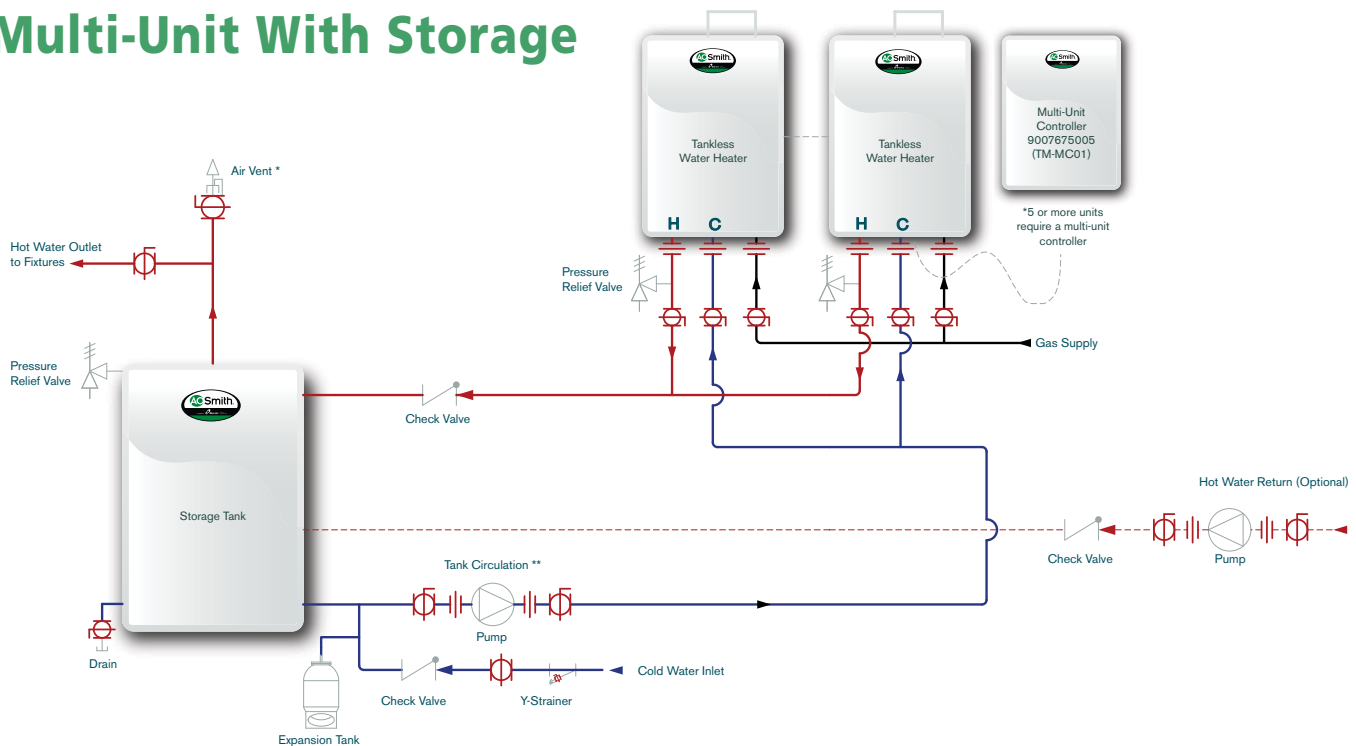


All application diagrams shown are concept drawings only. These diagrams are only to be used as basic guides. It is up to the application designer to properly design the plumbing layout and correctly size all components within an application (pumps, piping, storage tanks, water heaters, etc.). All National and Local codes must be followed and will dictate proper compliance.

Multi-Unit



Multi-Unit With Storage

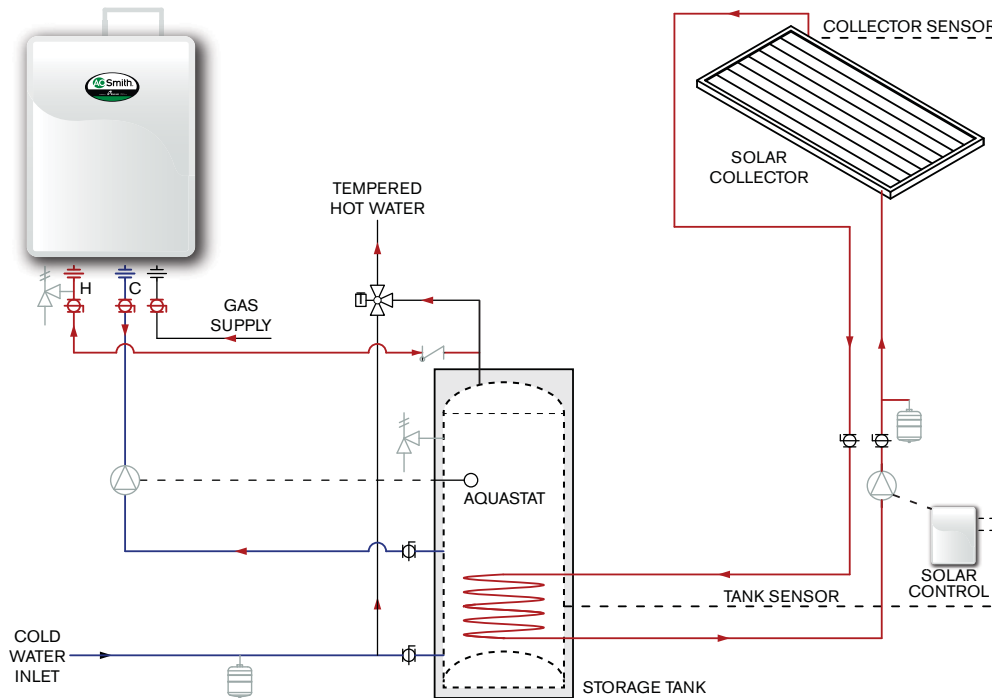


* The air vent is to be installed at the highest location of the system. The diameter of the pipe leading up the air vent is to be no smaller than the piping throughout the system.

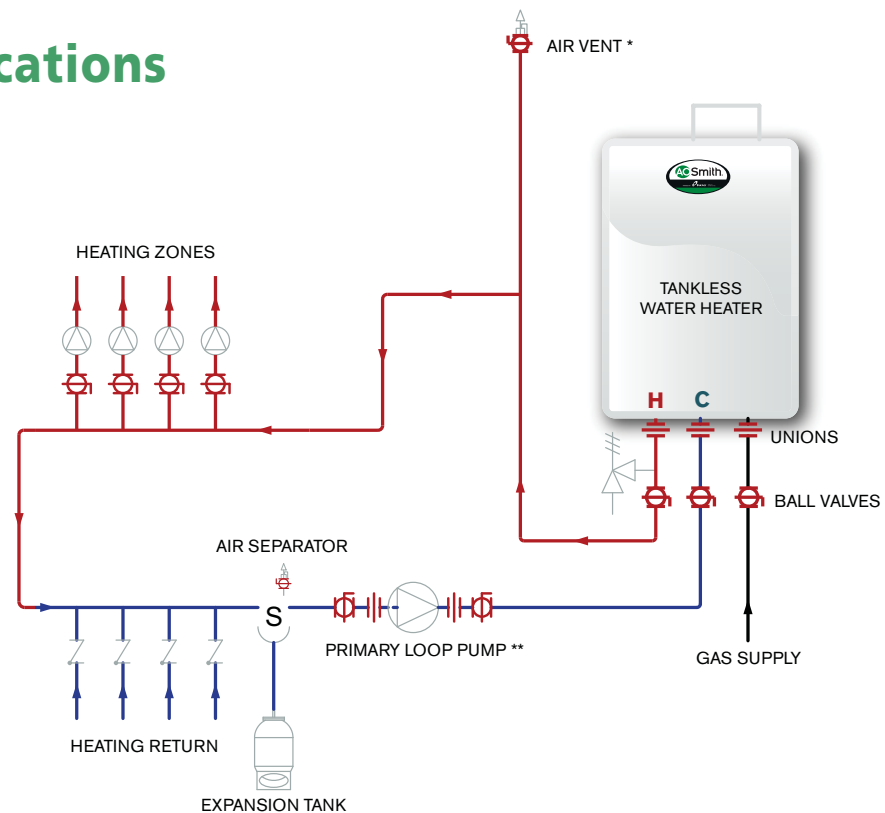
** 1. The tank circulation pump is to be controlled by: Dual-set aquastat (recommended w/ timer) OR Unit Pump Control set to "Storage Tank Mode" (if the unit model or controller has this function)

** 2. The tank circulation pump is to provide no less than 2 gpm through each activated unit in the system. (Exception: no less than 4 gpm through each 910 series)

Solar Tankless Back Up



Heating Applications



* The air vent is to be installed at the highest location of the system. The diameter of the pipe leading up the air vent is to be no smaller than the piping throughout the system.

** 1. Control of the primary loop pump is dependent on the requirement of the heating application.

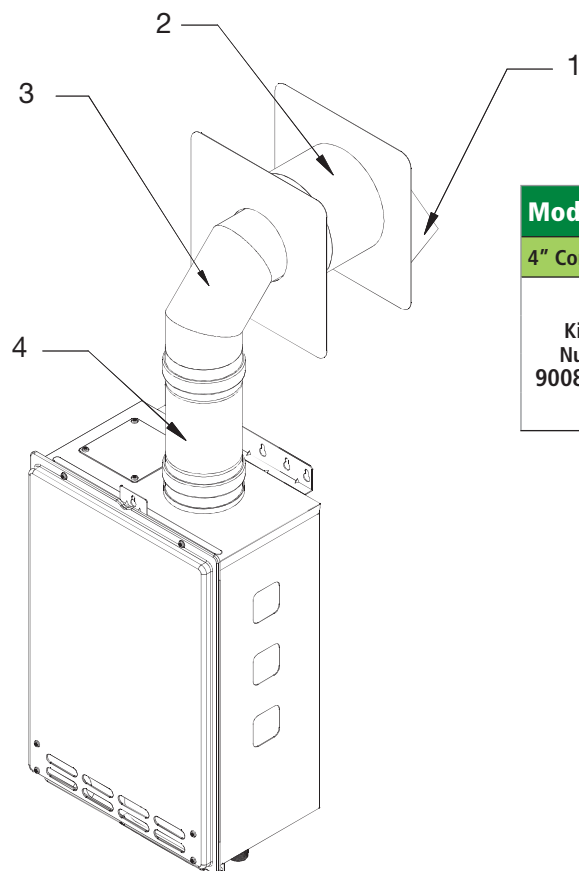
** 2. The primary loop pump is to provide no less than 2 gpm through each activated State unit in the system. (Exception: no less than 4 gpm through each 910 series)

*** Size of zone pumps and method of control are dependent on the requirements of the heating application.

Venting Diagrams (Examples)

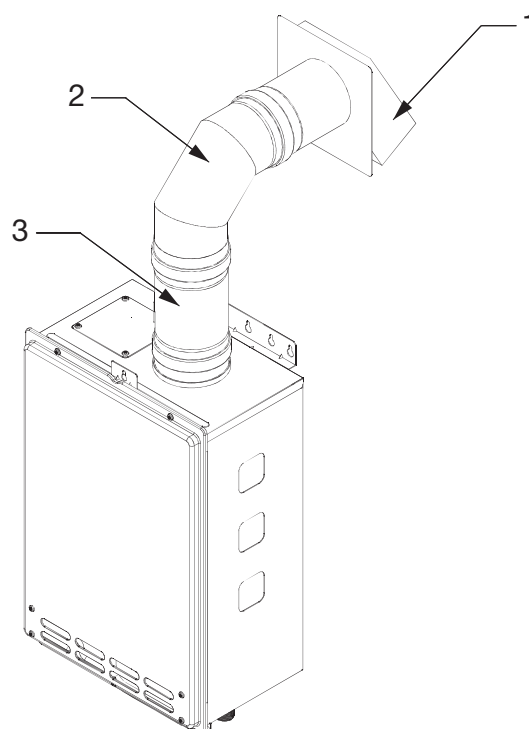
4" Sidewall Termination

(Please check the wall thickness for proper installation)



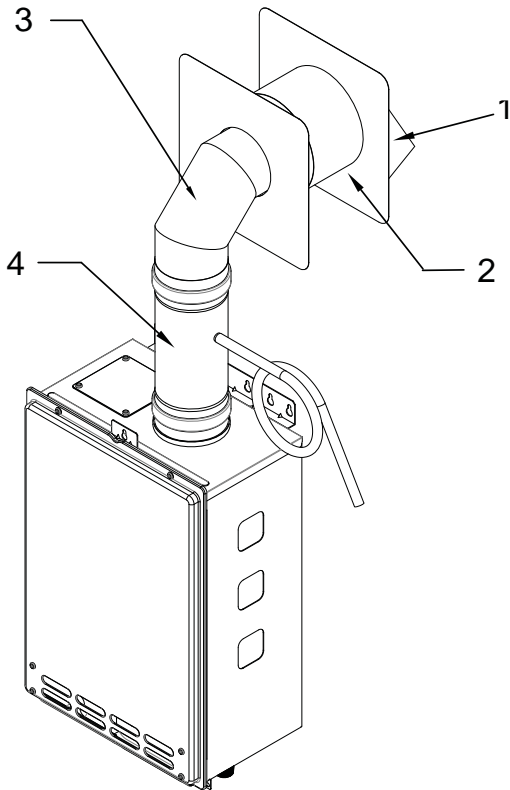
Models 110/U, 310/U, 510/U, 710				
4" Combustible Sidewall Termination				Qty.
Kit Part Number: 9008339005	1	9007999005	4" Sidewall Hood Terminator	1
	2	9008345005	4" Wall Thimble (4.0"-7.0")	1
	3	9007980005	4" 90 degree Elbow	1
	4	9007979005	4" Female-Female Adaptor	1

Models 110/U, 310/U, 510/U, 710				
4" Non-Combustible Sidewall Termination				Qty.
Kit Part Number: 9008481005	1	9007999005	4" Sidewall Hood Terminator	1
	2	9007980005	4" 90 degree Elbow	1
	3	9007979005	4" Female-Female Adaptor	1



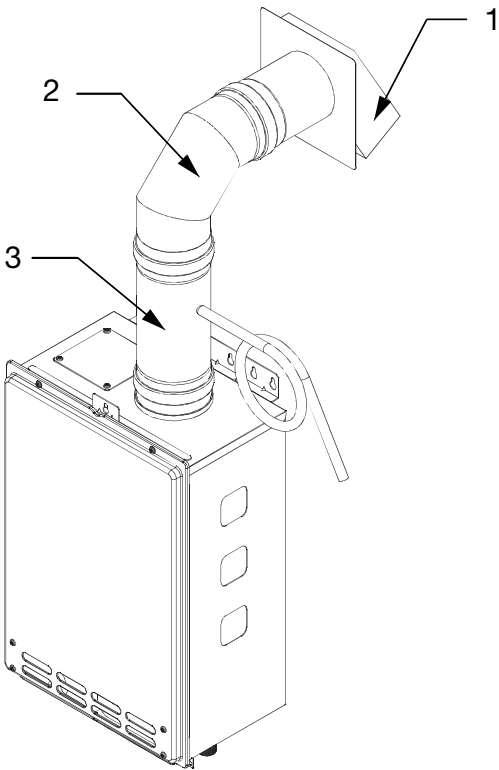
4" Sidewall Termination (With Condensate Trap)

(Please check the wall thickness
for proper installation)



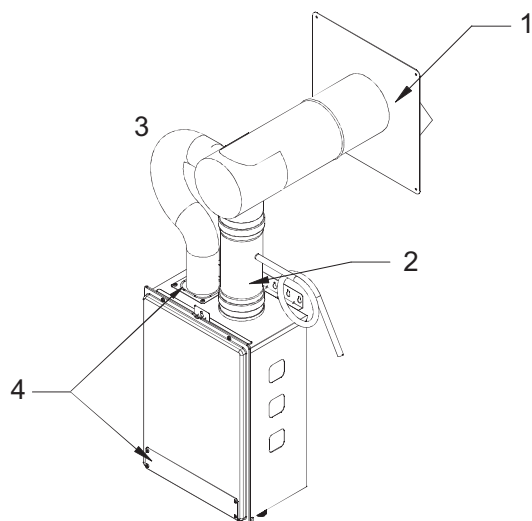
Models 110/U, 310/U, 510/U, 710				
4" Combustible Sidewall Termination (With Condensate Trap)				Qty.
Kit Part Number: 9008489005	1	9007999005	4" Sidewall Hood Terminator	1
	2	9008345005	4" Wall Thimble (4.0"-7.0")	1
	3	9007980005	4" 90 degree Elbow	1
	4	9008146005	4" Universal Appliance Adaptor	1

Models 110/U, 310/U, 510/U, 710				
4" Non-Combustible Sidewall Termination (With Condensate Trap)				Qty.
Kit 4 Part Number: 9008490005	1	9007999005	4" Sidewall Hood Terminator	1
	2	9007980005	4" 90 degree Elbow	1
	3	9008146005	4" Universal Appliance Adaptor	1



Direct Vent, Concentric Sidewall Termination

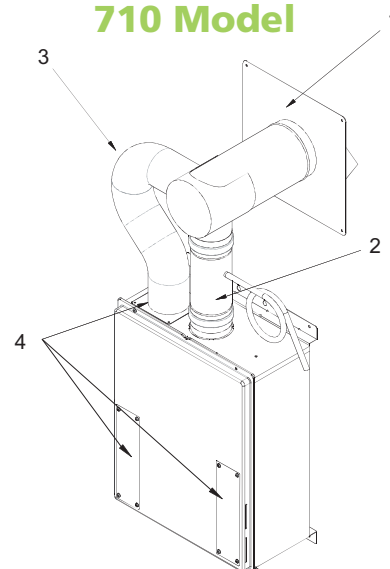
110/U, 310/U, 510/U Models



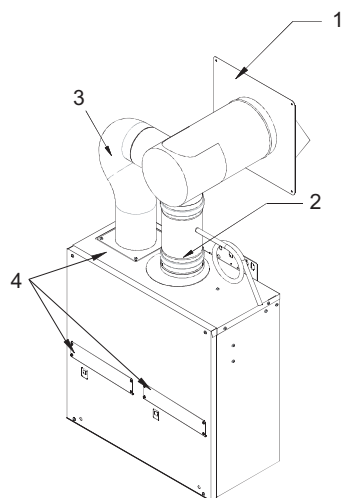
Models 110/U, 310/U, 510/U				
5-10" Sidewall Thickness Direct Vent, Concentric Termination				Qty.
Kit Part Number: 9008001005	1	9008147005	Concentric Intake/Exhaust Kit	1
	2	9008146005	Universal Appliance Adaptor	1
	3	N/A	3" Aluminum Flex	1
	4	9007667005	Direct Vent Conversion Kit	1
12-18" Sidewall Thickness Direct Vent, Concentric Termination				Qty.
Kit Part Number: 9008000005	1	9008147005	Concentric Intake/Exhaust Kit	1
	2	9008146005	Universal Appliance Adaptor	1
	3	N/A	3" Aluminum Flex	1
	4	9007667005	Direct Vent Conversion Kit	1

Models 710				
5-10" Sidewall Thickness Direct Vent, Concentric Termination				Qty.
Kit Part Number: 9008206005	1	9008149005	Concentric Intake/Exhaust Kit	1
	2	9008146005	Universal Appliance Adaptor	1
	3	N/A	4" Aluminum Flex	1
	4	9007668005	Direct Vent Conversion Kit	1
12-18" Sidewall Thickness Direct Vent, Concentric Termination				Qty.
Kit Part Number: 9008207005	1	9008150005	Concentric Intake/Exhaust Kit	1
	2	9008146005	Universal Appliance Adaptor	1
	3	N/A	4" Aluminum Flex	1
	4	9007668005	Direct Vent Conversion Kit	1

710 Model

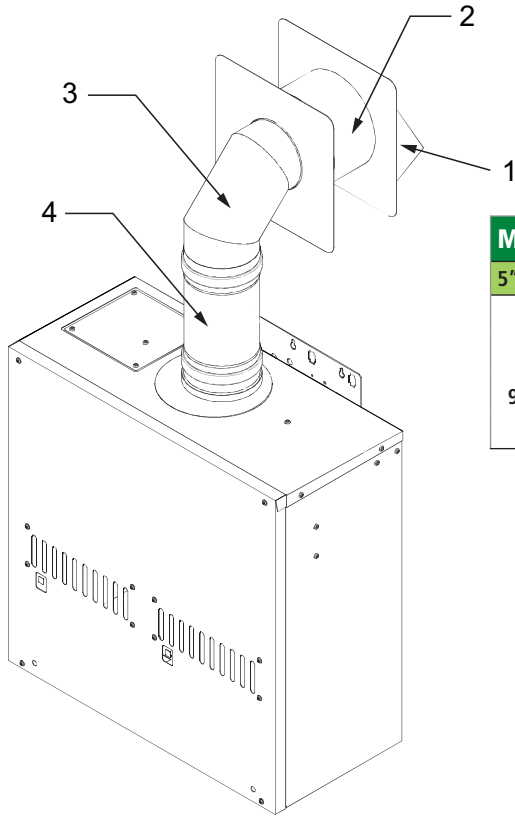


910 Model



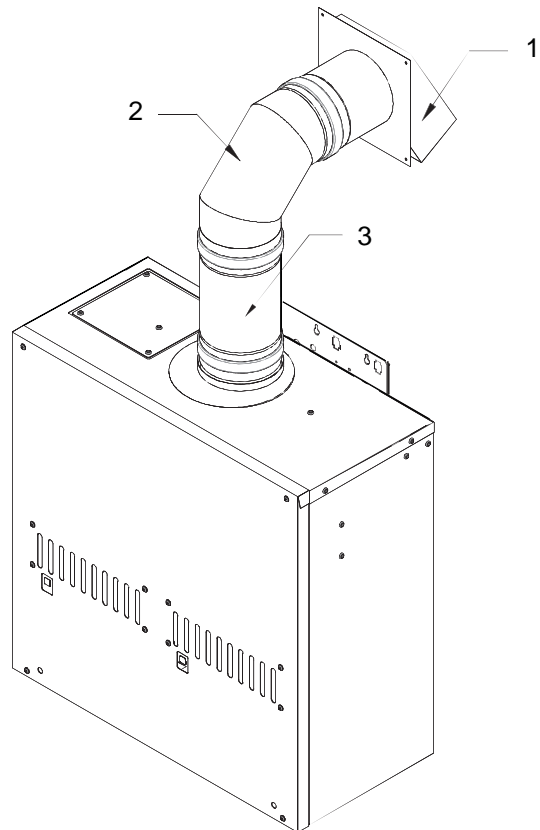
Models 910				
5-10" Sidewall Thickness Direct Vent, Concentric Termination				Qty.
Kit Part Number: 9008210005 5"-10"	1	9008208005	Concentric Intake/Exhaust Kit	1
	2	9008201005	Universal Appliance Adaptor	1
	3	N/A	5" Aluminum Flex	1
	4	9007669005	Direct Vent Conversion Kit	1
12-18" Sidewall Thickness Direct Vent, Concentric Termination				Qty.
Kit Part Number: 9008205005 12"-18"	1	9008209005	Concentric Intake/Exhaust Kit	1
	2	9008201005	Universal Appliance Adaptor	1
	3	N/A	5" Aluminum Flex	1
	4	9007669005	Direct Vent Conversion Kit	1

5" Sidewall Termination

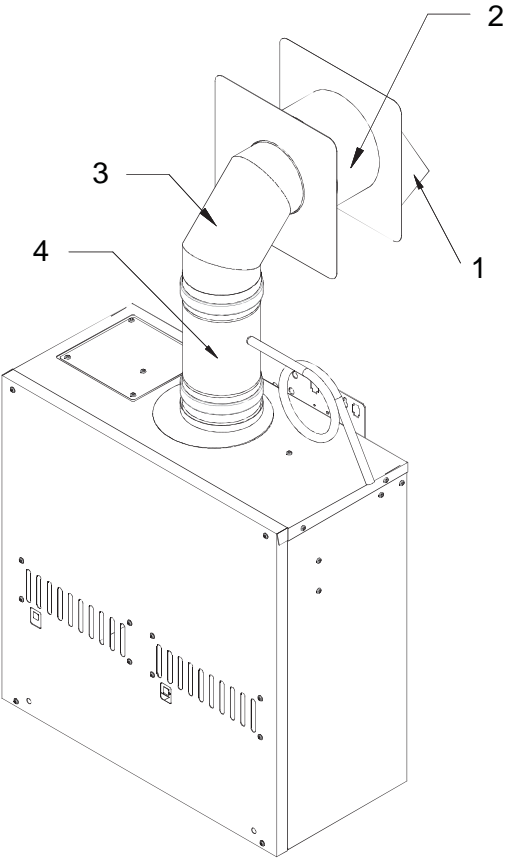


Models 910				
5" Combustible Sidewall Termination				Qty.
Kit Part Number: 9008342005	1	9008197005	5" Sidewall Hood Terminator	1
	2	9008347005	5" Wall Thimble (4.0"-7.0")	1
	3	9008188005	5" 90 degree Elbow	1
	4	9008203005	5" Female-Female Adaptor	1

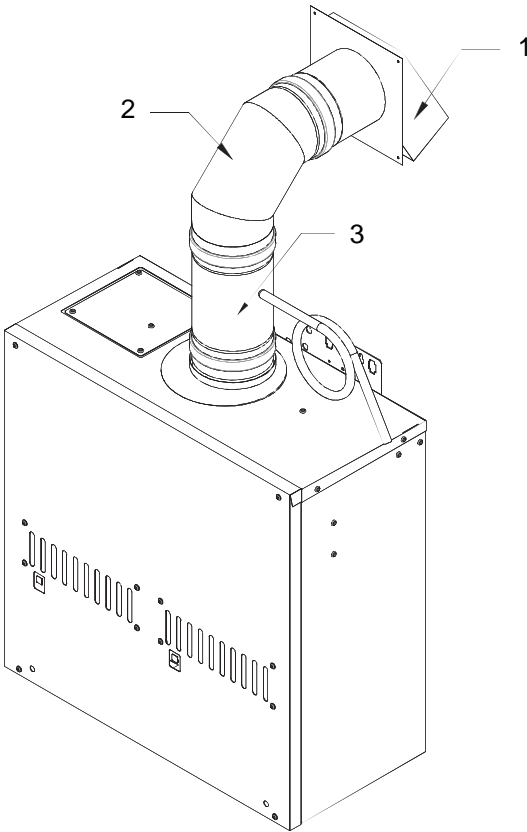
Models 910				
5" Non-Combustible Sidewall Termination				Qty.
Kit 8 Part Number: 9008482005	1	9008197005	5" Sidewall Hood Terminator	1
	2	9008188005	5" 90 degree Elbow	1
	3	9008203005	5" Female-Female Adaptor	1



5" Sidewall Termination (With Condensate Traps)

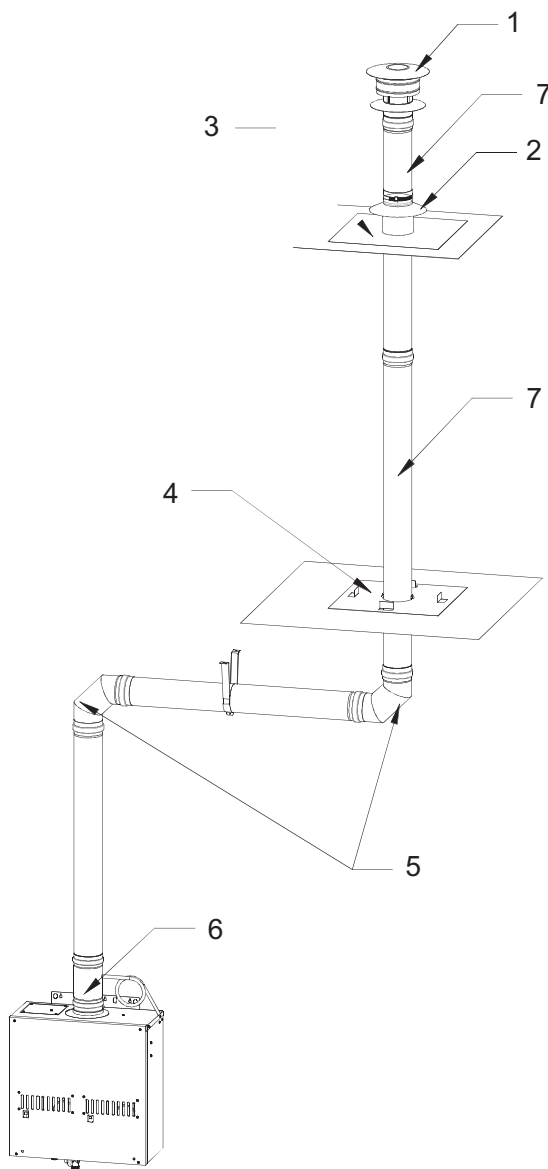


Models 910				
5" Combustible Sidewall Termination (With Condensate Trap)				Qty.
Kit 9 Part Number: 9008491005	1	9008197005	5" Sidewall Hood Terminator	1
	2	9008347005	5" Wall Thimble (4.0"-7.0")	1
	3	9008188005	5" 90 degree Elbow	1
	4	9008201005	5" Universal Appliance Adaptor	1

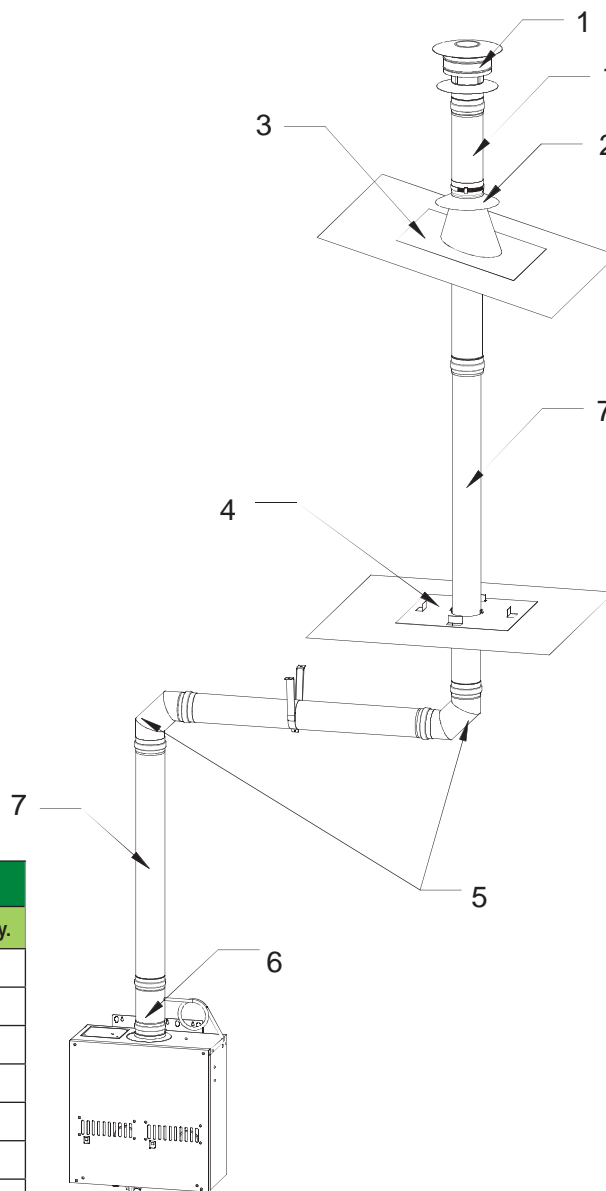


Models 910				
5" Non-Combustible Sidewall Termination (With Condensate Trap)				Qty.
Kit 10 Part Number: 9008492005	1	9008197005	5" Sidewall Hood Terminator	1
	2	9008188005	5" 90 degree Elbow	1
	3	9008201005	5" Universal Appliance Adaptor	1

5" Rooftop Termination



Model 910				
5" Flat Roof Termination				Qty.
Kit Part Number: 9008343005	1	9008200005	5" Extreme Weather Rain Cap	1
	2	9008193005	5" Storm Collar	1
	3	9008195005	5" Flat Roof Flashing	1
	4	9008194005	5" Vertical Firestop	1
	5	9008188005	5" 90 degree Elbow	2
	6	9008201005	5" Universal Appliance Adaptor	1
	7	Refer to page 49	Straight Pipe	TBD



Model 910				
5" Angled Roof Termination				Qty.
Kit Part Number: 9008344005	1	9008200005	5" Extreme Weather Rain Cap	1
	2	9008193005	5" Storm Collar	1
	3	9008196005	5" Angled Roof Flashing	1
	4	9008194005	5" Vertical Firestop	1
	5	9008188005	5" 90 degree Elbow	2
	6	9008201005	5" Universal Appliance Adaptor	1
	7	Refer to page 49	Straight Pipe	TBD

Venting Components

Simple Leak-Proof Gasketed Connections – No Sealant Required. **High Quality** – Category III / IV Stainless Steel.

Versatile – Vertical and Horizontal Terminations. **Convenient** – Vent Kits Available.

UL Listed. All Connections have Heat Resistant Rubber Gaskets

Nova Vent Part #	DESCRIPTION	
STRAIGHT VENT PIPE		
9007987005	4" Straight pipe - 6" Length	
9007986005	4" Straight pipe - 12" Length	
9007984005	4" Straight pipe - 24" Length	
9007983005	4" Straight pipe - 36" Length	
9007982005	4" Straight pipe - 48" Length	
9008181005	5" Straight pipe - 6" Length	
9008182005	5" Straight pipe - 12" Length	
9008183005	5" Straight pipe - 24" length	
9008184005	5" Straight pipe - 36" Length	
9008185005	5" Straight pipe - 48" Length	
ADJUSTABLE VENT PIPE		
9007985005	4" Adjustable Pipe (7" - 9.9")	
9008186005	5" Adjustable Pipe (7" - 9.9")	
ELBOW		
9007981005	4" 45 Degree Elbow	
9008187005	5" 45 Degree elbow	
9007980005	4" 90 Degree Elbow	
9008188005	5" 90 Degree Elbow	
ADAPTOR		
9007979005	4" Female-Female Adaptor	
9008203005	5" Female-Female Adaptor	
9008146005	4" Universal Appliance Adaptor 3-in-1 (F-F adaptor, condensate drain, & back-flow preventer)	
9008201005	5" Universal Appliance Adaptor 3-in-1 (F-F adaptor, condensate drain, & back-flow preventer)	

Nova Vent Part #	DESCRIPTION	
BACKFLOW PREVENTER		
9007996005	4" Backflow Preventer & F-F Adaptor	
9008202005	5" Back-flow Preventer & F-F Adaptor	
CONDENSATION DRAIN		
9007994005	4" Horizontal Drain Tee	
9008191005	5" Horizontal Drain Tee	
9007993005 (M-F)	4" Vertical Drain Tee	
9008192005	5" Vertical Drain Tee	
SUPPORT		
9007989005	4" Support Strap (1")	
9008204005	5" Support Strap (1")	
WALL THIMBLE		
9008345005 (4"-7")	4" Wall Thimble	
9008346005 (5"-10")	4" Wall Thimble	
9008347005 (4"-7")	5" Wall thimble	
9008348005 (5"-10")	5" Wall thimble	
4" SIDEWALL TERMINATION & THIMBLE KIT		
9008004005 (4"-7")	Sidewall Vent Terminator (Hood) and Wall Thimble	
9008005005 (5"-10")	Sidewall Vent Terminator (Hood) and Wall Thimble	

Nova Vent Part #	DESCRIPTION		
TERMINATION			
9008144005	4" Termination Tee		
9008198005	5" Termination Tee		
9007999005	4" Exhaust Sidewall Vent Terminator (Hood)		
9008197005	5" Exhaust Sidewall Vent Terminator (Hood)		
9007995005	4" Rain Cap		
9008145005	4" Extreme Weather Rain Cap		
9008200005	5" Extreme Weather Rain Cap		
9007611005	3" Concentric PVC Termination		
FIRESTOP			
9007988005	Vertical Firestop		
9008194005	5" Firestop		
ROOF FLASHING			
9007992005	4" Flat Roof Flashing		
9008195005	5" Flat Roof Flashing		
9007991005	4" Angled Roof Flashing		
9008196005	5" Angled Roof Flashing		
STORM COLLAR			
9007990005	4" Storm Collar		
9008193005	5" Storm Collar		
DIRECT VENT CONVERSION KIT			
9007667005	Direct Vent Conversion Kit for NIE models 110/310/510		
9007668005	Direct Vent Conversion Kit for NIEA Model 710		
9007669005	Direct Vent Conversion Kit for NIEA Model 910		

Nova Vent Part #	DESCRIPTION	
INTAKE HOOD (GALVANIZED)		
9008142005	3"	
9008143005	4"	
9008180005	5"	
DIRECT VENT, CONCENTRIC SIDEWALL TERMINATION KIT		
Includes : DV Conversion Kit, Concentric Termination, Universal Adaptor 3-in-1, Aluminum Flex and Gear Clamp		
9008001005	5.0" to 10.0" 3" Intake, 4" Exhaust	
9008000005	12.0" to 18.0" 3" Intake, 4" Exhaust	
9008206005	5.0" to 10.0" 4" Intake, 4" Exhaust	
9008207005	12.0" to 18.0" 4" Intake, 4" Exhaust	
9008210005	5.0" to 10.0" 5" Intake, 5" Exhaust	
9008205005	12.0" to 18.0" 5" Intake, 5" Exhaust	

Accessories

Accessories

			110/110U INDOOR 110/110U OUTDOOR 310/310U INDOOR 310/310U OUTDOOR 510/510U INDOOR 510/510U OUTDOOR 140 and 240 INDOOR 140 and 240 OUTDOOR 340 INDOOR 340 OUTDOOR 540 INDOOR 540 OUTDOOR 710 INDOOR 910 INDOOR / OUTDOOR															
PART #		DESCRIPTION																
9007666005		Remote Temperature Controller	X	X	X	X												
9007603005							X	X							X	X		
9008172005			●	●	●	●	●	●	X	X	X	X	X	X				
9007670005		Pipe Cover	●	●	X	X	X	X										
9007671005			X	X														
9007672005																X		
9007673005																	X	
9008331005 (excludes 140)										X	X	X	X	X	X			
9008953005 (140 only)										X	X							
9007674005		Recess Box		X		X		X										
9007675005		Multiple Unit Controller														X	X	
9008300005							●	●					X	X				
9007604005		Lead Free Isolation Valves & a Pressure Relief Valve	X	X	X	X	X	X	X	X	X	X	X	X				
9007778005																X		
9007780005																		X
9007607005		Neutralizer							X	X	X	X	X	X				
9007676005		Outdoor Vent Cap														X		
9007677005																		X
323631-000		Product Preservers® LG1.5L Anti-Scale System					W	W			W	W	W	W	C	C		
323631-001		LG1.5L Replacement Cartridge																
323631-002		Product Preservers® SM1.0L Anti-Scale System	CW	CW	CW	CW	C	C	CW	CW	C	C	C	C				
323631-003		SM1.0L Replacement Cartridge																

X = Standard

● = Ultra-Low NOx Models

C = Cooler Climate

W = Warmer Climate

Hard Water and Tankless Heaters

Hard water can adversely affect plumbing systems, from water piping to water fixtures, and even down to the water heating system. For piping and fixtures, hard water can create more pressure loss and reduce water flow. For water heaters, it can even reduce energy efficiency and damage the heater. This is especially true for tankless water heaters and it is important to understand what hard water is, what hard water does, and how to protect your tankless water heater from possible damage caused by hard water.

What is hard water and hard water scale?

Very simply, hard water is defined as water that has a high mineral content, specifically in magnesium and calcium (Ca^{2+} and Mg^{2+} ions). Hard water is not considered a health risk and these minerals generally remain dissolved in the water. However, the problems arise when the minerals precipitate out of the water and leave behind a solid mineral buildup. This buildup is called hard water scale, and it is this scale that reduces water flow through pipes and fixtures, reduces the energy efficiency of water heating equipment, and at worst, causes irreversible damage to the heat exchangers within tankless water heaters. It is important to note that the likelihood of scale formation is only based on the hardness levels of the water and the temperature of the water, not on the material the scale is adhering to. For example, hard water scale would form equally on a copper surface as it would on a stainless steel surface, given the same hardness level and temperature of water.

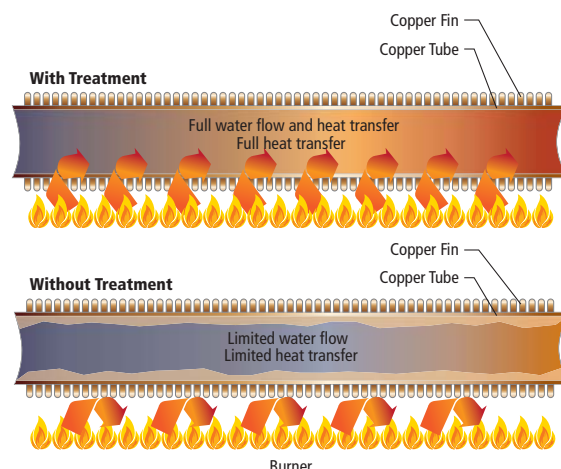
What does hard water scale do to my water heater?

When hard water scale forms a layer coating the inside wall of a tankless heat exchanger fin pipe, it acts as a thermal insulator. This insulation effectively prevents a significant amount of heat, coming from the burners, from properly transferring into the water within the piping. Because the heat is not transferring into the water, the heat exchanger material is forced to retain this excess heat, eventually overheating and becoming damaged. Once the material has degraded enough, the heat exchanger piping eventually gives way and water leakage occurs.

Picture shows a clean HX with treatment.



Scale Build up from untreated water.



Flow Rate Based Ground Water Temperature (assume 120°F Setpoint)

		Tankless Model	140H	110/U	240H	310/U	510/U	340H	540H	710	910
		Input (BTU/h)	120000	140000	160000	190000	199000	180000	199000	240000	380000
		Output (BTU/h)	111600	114800	152000	155800	163180	171000	189050	196800	304000
Ground Water Temperature (°F)	Warmer Climate	85	6.40	6.56	6.60	8.00	9.32	8.00	10.00	9.00	14.50
		80	5.60	5.74	6.60	7.79	8.16	8.00	9.45	9.00	14.50
		75	5.00	5.10	6.60	6.92	7.25	7.60	8.40	8.75	13.51
		70	4.50	4.59	6.08	6.23	6.53	6.84	7.56	7.87	12.16
		65	4.10	4.17	5.53	5.67	5.93	6.22	6.87	7.16	11.05
		60	3.70	3.83	5.07	5.19	5.44	5.70	6.30	6.56	10.13
	Colder Climate	55	3.40	3.53	4.68	4.79	5.02	5.26	5.82	6.06	9.35
		50	3.20	3.28	4.34	4.45	4.66	4.89	5.40	5.62	8.69
		45	3.00	3.06	4.05	4.15	4.35	4.56	5.04	5.25	8.11
		40	2.80	2.87	3.80	3.90	4.08	4.28	4.73	4.92	7.60
		35	2.60	2.70	3.58	3.67	3.84	4.02	4.45	4.63	7.15

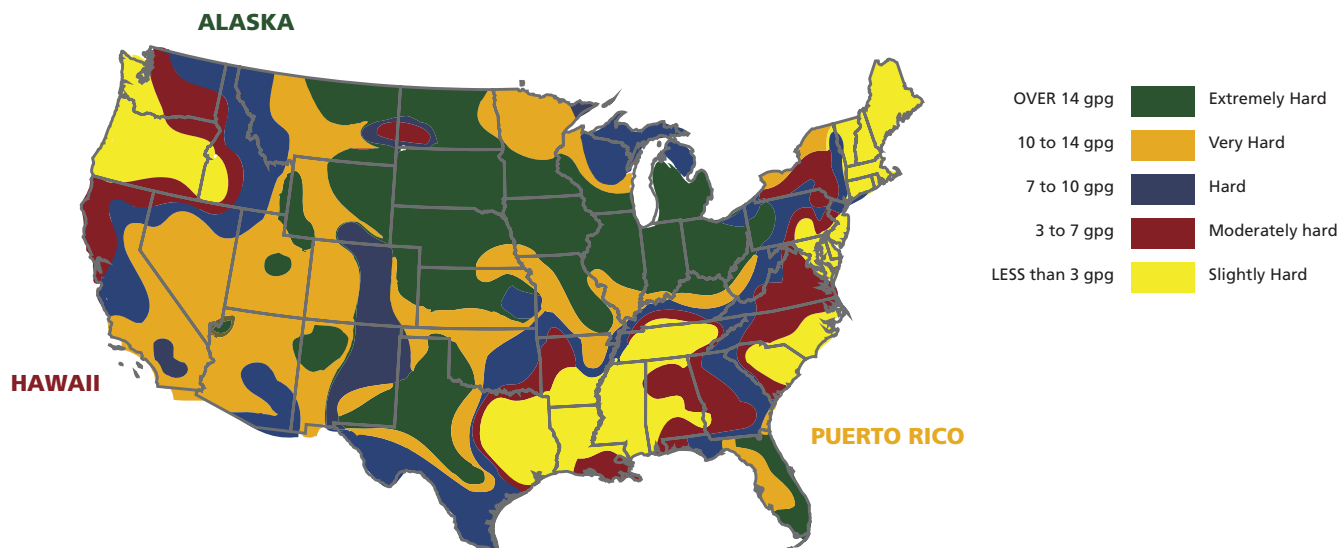
Product Preservers® protects your tankless heat exchanger from scale formation. Refer to the chart to properly size for your application.



323631-002	Product Preservers® SM1.0L Anti-Scale System
323631-000	Product Preservers® LG1.5L Anti-Scale System
	Requires multiple units

Where is hard water found?

Hard water is everywhere. In fact, more than 85% of American homes have hard water.



How is the hardness of water measured?

Water hardness is measured in either parts per million (ppm) or grains per gallon (gpg). Anything that measures above 3 gpg is generally considered hard (United States Geological Survey) and it is advised at this point to look into water treatment. The U.S. Department of Interior and the Water Quality Association have classified water hardness under several levels:

































CLASSIFICATION	MG/L OR PPM (PARTS PER MILLION)	GPG (GRAINS PER GALLON)
Soft	0 - 17	0 - 1
Slightly Hard	17 - 60	1 - 3.5
Moderately Hard	61 - 120	3.5 - 7.0
Hard	121 - 180	7.0 - 10.5
Very Hard	180 and above	10.5 and above

How do I prevent hard water scale?

Fortunately, there are quite a few great options to choose from when looking to protect water heating equipment from scale buildup. These solutions range in cost, maintenance, and application, so it is always best to consult with water treatment professionals before making the final decision on a water treatment solution.

- Ion exchanger water softeners: Water softeners are probably the most common solution used today for eliminating hard water. Calcium and magnesium ions are removed from the water and replaced with sodium ions. Without the calcium and magnesium, hard water scale cannot form.
- Product Preserver®: prevents scale by transforming dissolved hardness minerals into harmless, inactive microscopic crystal particles. These crystals stay suspended in the water and are passed to drain
- Siliphos: Interferes with the ability of (calcium and magnesium) Scale to crystallize. The suspended scale stays in the water and goes down the drain.

Models

			ATI		Inside		ATO		Outside	
			Connection: Gas/Water Power	Venting Intake Exhaust (Cat. III Stainless)	Easy-Link (EL) Multi-Unit (MU)	Temperature (with remote)	GPM (Max) Per Unit	Energy Factor NG, LP	NG Max (BTU/h), LP Max (BTU/h)	Dimension/ Weight
Condensing	140H Series  ATO-140H  ATI-140H 	High efficiency ultra-low NOx condensing tankless. 3" PVC venting. 0" clearance to combustible.	1/2" Gas/ 3/4" Water 120 VAC	Intake & Exhaust 3", 70' Max, 5 elbow Max OR 4", 100' Max, 5 elbow Max (PVC venting capable) OS= no venting required	N/A	100 to 140 (100 to 140)	6.6	Energy Factor NG: 0.93 LP: 0.93	NG: 120,000 LP: 120,000	H = 22-7/8" W = 13-3/8" D = 10-13/16" 44 lbs
	240H Series  ATO-240H  ATI-240H 	High efficiency ultra-low NOx condensing tankless. 3" PVC venting. 0" clearance to combustible.	3/4" Gas/ Water 120 VAC	Intake & Exhaust 3", 70' Max, 5 elbow Max OR 4", 100' Max, 5 elbow Max (PVC venting capable) OS= no venting required	N/A	100 to 140 (100 to 140)	6.6	Energy Factor NG: 0.95 LP: 0.95	NG: 160,000 LP: 160,000	H = 22-1/2" W = 17-3/4" D = 10-3/4" 58 lbs
	340H Series  ATO-340H  ATI-340H  	High efficiency ultra-low NOx condensing tankless. 3" PVC venting. 0" clearance to combustible.	3/4" Gas/ Water 120 VAC	Intake & Exhaust 3", 70' Max, 5 elbow Max OR 4", 100' Max, 5 elbow Max (PVC venting capable) OS = no venting required	N/A	100 to 140 (100 to 140)	8.0	Energy Factor NG: 0.95 LP: 0.95	NG: 180,000 LP: 180,000	H = 22-1/2" W = 17-3/4" D = 10-3/4" 58 lbs
	540H Series  ATO-540H  ATI-540H  	High efficiency ultra-low NOx condensing tankless. 3" PVC venting. 0" clearance to combustible.	3/4" Gas/ Water 120 VAC	Intake & Exhaust 3", 70' Max, 5 elbow Max OR 4", 100' Max, 5 elbow Max (PVC venting capable) OS = no venting required	(EL) 4 units (MU) 20 units	100 to 185 (100 to 185)	10.0 (4 units generate 40 GPM Max; 20 units generate 200 GPM Max)	Energy Factor NG: 0.95 LP: 0.95	NG: 199,000 LP: 199,000	H = 22-1/2" W = 17-3/4" D = 10-3/4" 59 lbs
Non-Condensing Ultra-Low NOx	110 Series  ATO-110  ATI-110 	Great for apartments, condos and summer cabins.	3/4" Gas/ Water 120 VAC	ATI Model: Intake 3" (50' Max) Exhaust 4" (50' Max) OS Model N/A	N/A	113 to 140 (99 to 167)	6.6	Energy Factor NG: 0.82 LP: 0.83	NG: 140,000 LP: 140,000	H= 20-1/2" W= 13-3/4" D= 6-3/4" 33 lbs
	310 Series  ATO-310  ATI-310 	Adds 1 more shower over the 110 at minimal increase in cost.	3/4" Gas/ Water 120 VAC	ATI Model: Intake 3" (50' Max) Exhaust 4" (50' Max) OS Model N/A	N/A	113 to 140 (99 to 167)	8.0	Energy Factor NG: 0.82 LP: 0.82	NG: 190,000 LP: 190,000	H= 20-1/2" W= 13-3/4" D= 8-1/2" 38 lbs
	510 Series  ATO-510  ATI-510  	Well suited for light commercial applications. HRS Copper.	3/4" Gas/ Water 120 VAC	ATI Model: Intake 3" (50' Max) Exhaust 4" (50' Max) OS Model N/A	(EL) 4 units (MU) 20 units (510U only)	104 to 185 (99 to 185)	10.0 (4 units generate 40 GPM Max; 510U generates up to 200 GPM Max)	Energy Factor NG: 0.82 LP: 0.82	NG: 199,000 LP: 199,000	H= 20-1/2" W= 13-3/4" D= 8-1/2" 39 lbs
Non-Condensing	710 Series  ATO-710   	Generates 180 Gpm (Max) when manifolding 20 units. HRS Copper. LED display	3/4" Gas/ Water 120 VAC	Intake 4" (50' Max) Exhaust 4" (50' Max)	(EL) 4 units (MU) 20 units	100 to 185 (100 to 185)	9.0 (4 units generate 36 GPM Max; 20 units generate 180 GPM Max)	Thermal Efficiency NG: 82.2% LP: 83.9%	NG: 240,000 LP: 240,000	H= 23-5/8" W= 18-1/2" D= 8-7/8" 59 lbs
	910 Series  ATO-910   	Generates Most GPM in tankless industry. 14.5 GPM (Max). HRS Copper. LED display	1" Gas/ Water 120 VAC	Intake 5" (50' Max) Exhaust 5" (50' Max)	(EL) 4 units (MU) 10 units	100 to 185 (100 to 185)	14.5 (4 units generate 58 GPM Max; 10 units generate 145 GPM Max)	Thermal Efficiency NG: 80.2% LP: 82.4%	NG: 380,000 LP: 380,000	H= 25-1/4" W= 24-3/4" D= 11-3/4" 102 lbs

ATI/O-110, ATI/O-310 & ATI/O-510 are available in standard non-condensing models, see pages 12-17.

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Notes

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