

Sustainable Energy Resources for Consumers (SERC) – On-Demand (Tankless) Water Heaters



Webinar

Ethan MacCormick

VP, Services to Energy Businesses

Performance Systems Development

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Instantaneous Gas Water Heaters



Gas-Fired, Directly Vented, Instantaneous Water Heater



Condensing Gas-Fired, Sealed Combustion, Instantaneous Water Heater

Instantaneous Electric Water Heaters



Electric, Central, Instantaneous Water Heater



Electric, Point-of-use, Instantaneous Water Heater

Technology Overview – Standard Gas Instantaneous

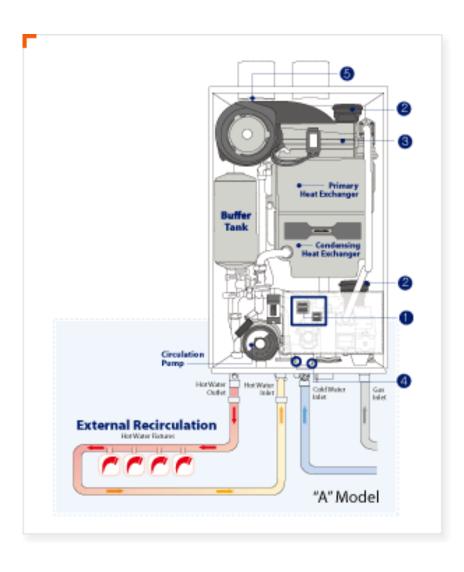
The Process:

- 1. A hot water tap is turned on.
- 2. Water enters the heater.
- The water flow sensor detects the water flow.
- The computer automatically ignites the burner.
- Water circulates through the heat exchanger.
- The heat exchanger heats the water to the designated temperature.
- When the tap is turned off, the unit shuts down.



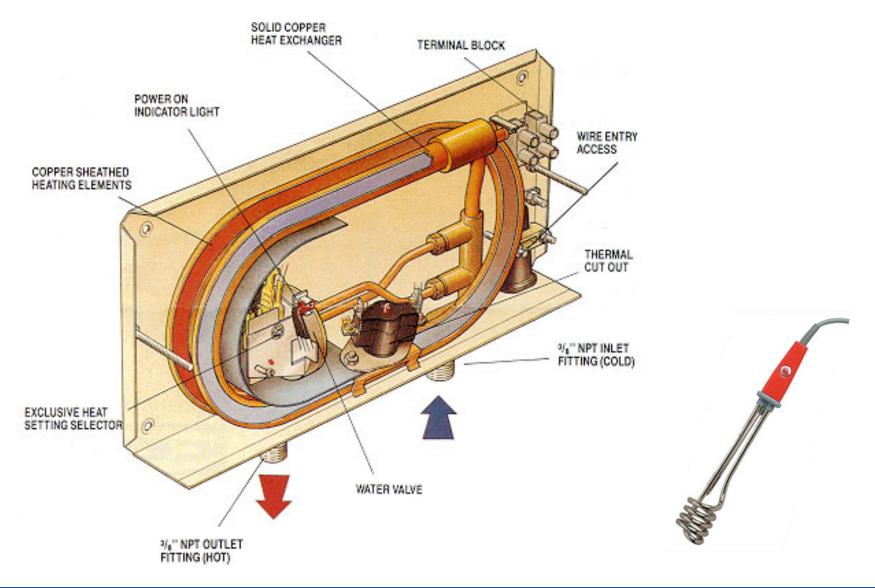
- Heats water through heat exchanger as needed
- No storage, minimal off-cycle losses

Technology Overview – Condensing Gas Instantaneous



- Heats water only as needed
- Heats water through primary heat exchanger and extracts additional heat from secondary heat exchanger

Technology Overview – Electric Instantaneous



Options - Gas Instantaneous





- Venting
 - Direct Vent
 - Sealed Combustion
- Ignition
 - Pilot
 - Spark , power
 - Spark, paddle wheel

Considerations / Issues - Instantaneous

- Small profile, saves space
- Endless supply of hot water
- Central hot water or point-of-use?
- Must be sized according to usage demand and winter entering water temperature.
- Saves significantly more energy over conventional storage heater when usage in house is low.
- Clean hot water...no rust or built up scale from tank storage
- Lasts longer and require less maintenance than traditional tank water heaters
- Larger gas input than conventional fired storage tank. May need to upsize the current gas train.
- Condensing gas instantaneous is a new and complex appliance. Need a special technician to service or troubleshoot.

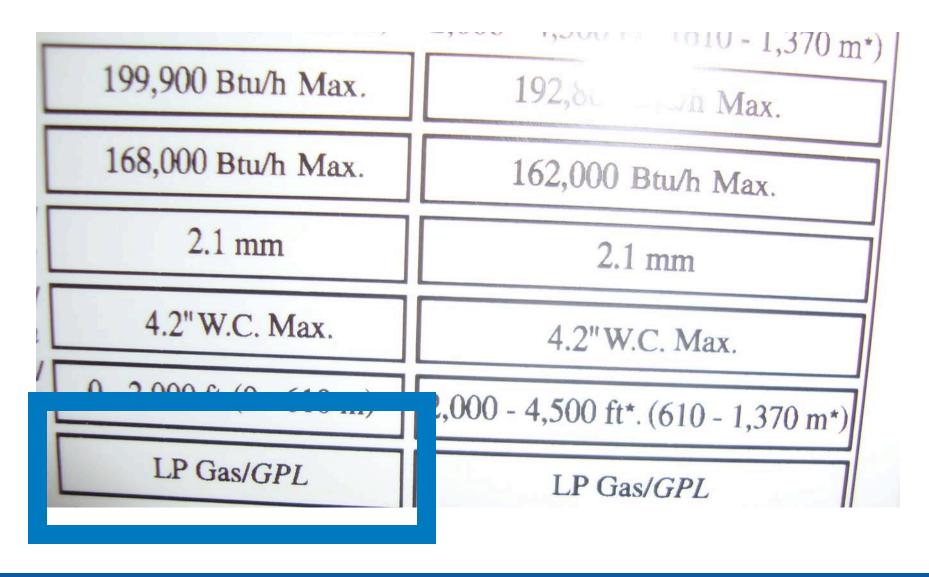
			PROJECT INFORMATION			
Property Address						
Manufacturer						
Model N	umber					
Fuel Typ	e		electricnatural gaspropane			
Applicat	ion		point of use (POU)whole house			
Capacity						
Inspecto	r					
Inspection	on Date					
HW Tem	perature S	etpoint				
HW Flov	rrate (GPN	1)				
			Inspection Checklist			
Yes	No	N/A	General	Note		
	-	-	Installed system is the only source of HW in the home			
	-	_	Installed system is in addition to existing HW system			
	-	-	HW system being repaced is:electricnatural gaspropane			
			Replaced HW system has been removed and all water, fuel and/or electrical connections to the system			
	-	-	have been removed or terminated safely			
	-	-	Installation is consistent with manufacturers' instructions.			
Yes	No	N/A	City inspection(s) have been passed: Permit # Date	Note		
res	HO	N/A	All system components are new.	note		
	_		Outlet water temperature has been checked to ensure appropriate, safe operating water temperature			
	_		System is located where it is easily accessible and meets clearances specified by the manufacutrer			
	_		Temperature & pressure valves are installled per manufacturer's recommendations and/or local code			
			For non-electrical units, venting is consistent with manufacturer's recommendations and/or local code			
	+	_				
	+	-	Any building components disturbed due to system installation have been restored to previous condition.			
Yes	No	N/A	Penetrations to building shell are sealed and fire resistance maintained. Plumbing	Note		
res	NO	N/A	There are no leaks in the system plumbing.	note		
	+	_	Pressure reducing valves are installed where cold water inlet pressure exceeds maximum allowable by			
			manufacturer			
	+	_	Potable water piping is copper, stainless steel, or PEX. Fittings are copper or brass. PEX connections are			
			made with compression fittings.			
	+	_	Piping runs are adequately and appropriately supported.			
	_		Pipe insulation properly sized to fit pipe and continuously closed and sealed using a manufacturer-			
			approved method.			
			Any pipe insulation exposed to outdoors is adequately protected.			
Yes	No	N/A	Electrical	Note		
	-	1	Water heater and electrical supply are properly grounded.			
			Proper overload fuse or circuit breaker protection installed.			
			Wiring and connections comply with all applicable code.			
Yes	No	N/A	System Documentation	Note		
			All valves, gauges and instruments are labeled per program specifications.			
			System has all required warning labels.			
			Maintenance Instructions sheet is mounted near/on system in clear plastic sleeve and includes: Emergency			
			and maintenance contact information. Instructions for protecting system from overheating during summer			
			vacations.			
			Description and recommended frequency of homeowner maintenance.			
			Copy of system diagram showing valves and meters.			
			Emergency and maintenance contact information.			
			Customer Manual is provided and includes:			
			Operation & Maintenance Instructions			
			As-built Plumbing Diagram			
			Mechanical Design			
			Contractor Warranty			
			Manufacturers' Warranties			
	_		Permit(s)			
	_	Parts and Source List				
			Data Sheets for all system components			
Yes No N/A		N/A	Owner Education	Note		
			Owner understands basic system operation.			
	_					
			Owner can accurately read system temperature setpoint			
			Owner can accurately read system temperature setpoint Owner understands required maintenance, including inlet filter cleaning, if applicable Owner knows who to call in the case of an emergency.			

	PROJECT INFORMATION
Property Address	
Manufacturer	
Model Number	
Fuel Type	electricnatural gaspropane
Application	point of use (POU)whole house
Capacity	
Inspector	
Inspection Date	
HW Temperature Setpoint	
HW Flowrate (GPM)	



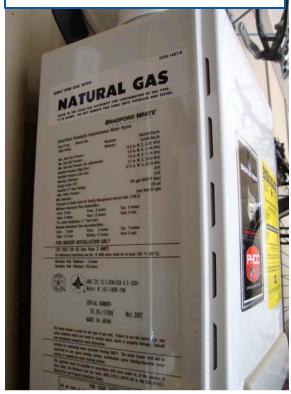
In this picture, two water heaters were installed for one high-use house

Natural Gas and Propane are not interchangeable



Yes	No	N/A	General		
			Installed system is the only source of HW in the home		
			Installed system is in addition to existing HW system		
			HW system being repaced is:electricnatural gaspropane		
			Replaced HW system has been removed and all water, fuel and/or electrical connections to the system		
			have been removed or terminated safely		
			Installation is consistent with manufacturers' instructions.		
			City inspection(s) have been passed: Permit # Date		





~ 36,000 Btu/hour



Yes	No	N/A	Equipment and Installation	
			All system components are new.	
			Outlet water temperature has been checked to ensure appropriate, safe operating water temperature	
			System is located where it is easiy accessible and meets clearances specified by the manufacutrer	
			Temperature & pressure valves are installled per manufacturer's recommendations and/or local code	
			For non-electrical units, venting is consistent with manufacturer's recommendations and/or local code	
			Any building components disturbed due to system installation have been restored to previous condition.	
			Penetrations to building shell are sealed and fire resistance maintained.	





Equipment and Installation - Venting





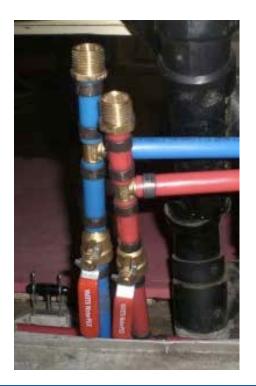
Equipment and Installation - Clearances



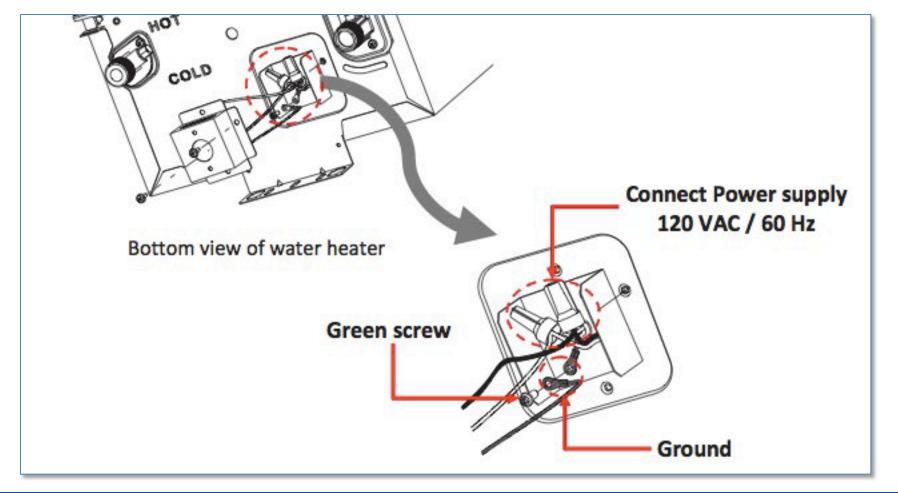
Yes	No	N/A	Plumbing	
			There are no leaks in the system plumbing.	
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			Potable water piping is copper, stainless steel, or PEX. Fittings are copper or brass. PEX connections are made with compression fittings.	
			Piping runs are adequately and appropriately supported.	
			Pipe insulation properly sized to fit pipe and continuously closed and sealed using a manufacturer-approved method.	
			Any pipe insulation exposed to outdoors is adequately protected.	







Yes	No	N/A	Electrical	
		Water heater and electrical supply are properly grounded.		
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Yes	No	N/A	System Documentation					
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			vacations.					
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			Copy of system diagram showing valves ar	nd meters.				
			Emergency and maintenance contact infor	mation.				
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			Operation & Maintenance Instructions					
			As-built Plumbing Diagram	Clearances from Appliance RVS3e RVS3e				
			Mechanical Design	8 8 8 1 1				
			Contractor Warranty					
			Manufacturers' Warranties	Back of O (perc)				
Shushing M	ig the Heat Exchanger (Error Code: LC or (0))	Permit(s)	Sides of Zinches 1/2 nch Nashar (25 mm) (10 mm) (25 mm) (10 mm) (25 mm) (10 mm) (25					
An 'LC' or '00' o appliance will ce warranty. After t	nor code includes the unit is beginning to lims up and in need damage to the head exchanger. Demage coursed by saling, least the LC fault code by turning of the power	f. MM2; and must be flushed. Failure to flush the od by lime build-up is not covered by the unifis wer to the unit and turning the power back.	Parts and Source List	Vert 0 (pert) 0 (pert) Plant 12 (where 2 inches) 16 (pert) 16 (p	Limited Warranty			
2. Chise the sh cold water in	actrical power to the water heater. alth waters on both the hot water send in (V) and VV) in (V) to the outle water value (V). District Note (VI) to the outle water value (VI). Those (VI) to service value (VI)	of Value Oncome Regulator	Data Sheets for all system components	The discretoe for sending is 24 inches in that of the water heater. For closet initialization, discretoes is 6 inches (152 min) from the figet.	What will Rinnal do?			
5. Pour 4 galor white viruspa 6. Place the do	s of undistance virgin, food grade, 224 In hose (HC) to	Yefre 191 dates Draw Varies on Notes Vision 192 Scienced Valve		Attachment of the Water Heater	Firms will repair or replace the covered product or any part or component that a furth. Firms will pay reasonable labor charges associated with the repair or nep repair parts must be genuine Rinnal parts. All repairs or replacements must be			
7. Open both s wider and co 8. Opende the to circulate 1	I etc the cleaning solution. The development of the property of the foot of the development of the developm	Rinnal		Identify the installation location and conform that the installation will need all negurino consurous. Securely statch the water heater to the wall using any of the hallow in the well installation brooklets.	company that is properly trained, state qualified or licensed to do the type of rep. Replacement of the product may be authorized by Rimai simily. Rimais does not for it any obligation or liability in connection with the replacement of the product.			
9. Tun of the		Water Heater		The installation will reset all requised cinearcoss. 2. Sociously with the water freshed in the walk using which are all the properties of the second of th	not possible. Rinnel will replace the product with a comparable product at Rinne naturated to Rinnel in found to be thee of defects in material or workmanking, or during return shipping, the warranty claim for product, parts and labor may be ob			
a Ramson to from the p to Glose ser- value, (V4	is these end of the drain hose (RO) iii. Cox valver, (V2), and open shutelf . Do not open shutelf valver, (VI).			NOTE: Rinnel water heaters should be installed in an opegy position. Do not negal uprade down or an 8 side.	How do liget service? You must contact a state qualified floarsed contractor or authorized service provi			
d. Ckee sen	to flow Prough the water houser for se valve, (VY), and open abutoff I house.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		RVSI & RVSI's Operation and Installation Manual	Warrierty. For the name of a qualified fauthorized service provider presse contact website (www.rhmes.ups), cell Rinnel at 1-800-621-9419 or write to Rinnel at 103 30099.			
12 With (VII) do sold water in filer back in 13. Reacce also	I house, ed, nemove the in-line titler at the it and clean sublam inclam. Place antif and open (v4). Issal power to the water heater.	AT THE PERSON NAMED IN COLUMN TO SERVICE AND ADDRESS OF THE PERSON NAMED IN COLUMN TO			Proof of purchase is required to obtain warranty service. You may show proof o registering within 30 days of purchasing the product. To register your tankless of			
CLEAN THEREIN Remove and de- win a soft plot of removing O-rings		AST TOWN			www.tincalingstation.com. For those without internet access, please call 1-99 by Rinna will constitute proof-of-purchase for this product. However, Registratic Wilerarchy.			
200000000000000000000000000000000000000	() H2	Water Line GMI Stamply State Line			What is not covered? This Warranty does not cover any failures or operating difficulties due to the folk			
undistec virgin, (white virage:	Circulating	Pump			accident, abuse, or misuse attention			
	RVS3 & RVS3+ Operator and insulate	n Minust 13			misapplication torce majeure torce majeure improver installation (such as out not limited to inadequate water quality, on			
			-		gas type, incorrect gas or water pressure, or absence of a drain pan under a			

User Documentation



Unit documentation should be preserved and secured

Owner Education

Owner understands basic system operation.

Owner can accurately read system temperature setpoint

Owner understands required maintenance, including inlet filter cleaning, if applicable

Owner knows who to call in the case of an emergency.



PERFORMANCE SYSTEMS D E V E L O P M E N T

Ethan MacCormick

VP, Services to Energy Businesses
Performance Systems Development
emaccormick@psdconsulting.com
www.psdconsulting.com