

Hot Water Generation - Gas-Fired/Water

ABH Gas-Fired Water Heater

A complete pre-piped condensing high efficiency gas-fired water heater featuring The Brain® Digital Recirculation Valve (DRV). Up to 99.8% efficiency (based on incoming water temperature) with a modulating stainless steel burner and a 5:1 turn down ratio (per heater).

Digital technology, via the DRV, provides precise water temperature control, enhanced user safety, and versatile Building Automation System (BS) connectivity options all in a single-source assembly.

Operational Specifications

- +/-2°F (1°C) DRV water temperature control at peak, moderate or zero fixture demand on hot water system designed for continuous recirculation
- 1°F (1°C) minimum recirculating water temperature differential
- LCD display which indicates: set point, delivered temperature, error codes and alarm conditions capable of BAS and mobile connectivity
- Programmable set point range of 81-158°F (27-70°C) capable of BAS or mobile monitoring and adjustment
- Programmable thermal disinfection range of 158-185°F (70-85°C)
- Programmable 1st level hi/lo temp alarm display capable of BAS or mobile alerting
- Automatic safe closure of hot water inlet in response to: inlet supply failure, 120V power failure, or programmable high temperature error
- Automatic safe closure of hot water inlet powered by a replaceable lithium battery monitored for low-level alerting
- Automatic safe closure response relayed to secondary safety shutoff valve
- Patented Cold Water Injection System (CWIS)

Technical Specifications

- Gas Pressure: Maximum-14" (356mm); Minimum-4" (102mm)
- Minimum recirculation flow: 2 GPM (7 LPM) per DRV25, 5 GPM (19 LPM) per DRV40, 10 GPM (37.9LPM) per DRV80
- Complete assembly lead free compliant
- Pre-piped isolation valves, strainers, check valves, gas piping, venting, condensate piping relief valves, thermometers and pressure gauges
- DRV conforms to ASSE 1017, CSA B125.3-11, UL E357437, and CE
- 120 volt power supply required for DRV; 208-240V, Single Phase for ABH
- Integral MODBUS RTU with connectivity options for Modbus TCP, BACnet, or LonWorks via SAGE®
- ABH conforms to ANSI Z21.13-2014/CSA 4.9-2014; UL795/CSA3.4; AHRI; ASME H Stamped
- Capacities from 199,000BTU/Hr. (58kW) to 2,520,000BTU/Hr (739kW) (additional capacities available upon request).

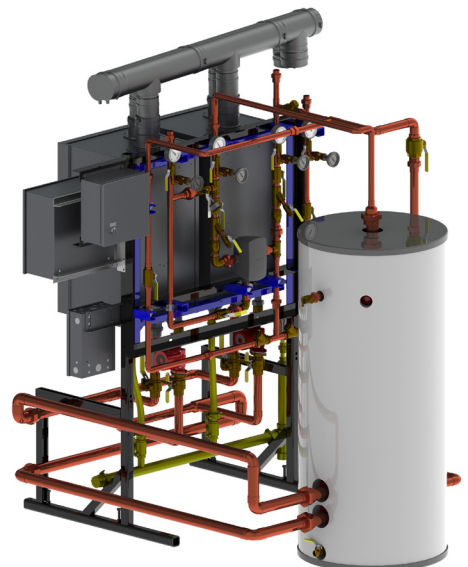
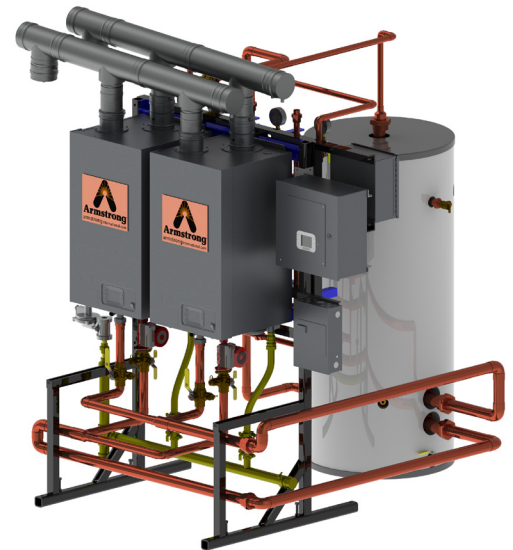
Standard Materials of Construction

- Heat Exchanger: 316L Stainless Steel
- Water Pipe: Type L Copper
- Fittings: Lead-Free Brass/Bronze
- Digital Mixing Valve: 316L Stainless Steel
- Fabricated Carbon Steel Frame With Machine Grade Enamel Paint
- Venting: Stainless Steel
- Storage Tank: Glass Lined ASME Rated

Connectivity

Integral MODBUS RTU for direct connectivity to BAS, or SAGE®

SAGE® (BS) module available with specific ProtoCessor cards for BAS connectivity to systems which operate on MODBUS TCP, BACnet™, or LonWorks™ protocols. Mobile connectivity features smart hot water system dashboard monitoring, secure remote programming, multi-location view, temperature and system diagnostic alerts, with unlimited digital documentation and automated report generation. Mobile connectivity may be enabled by a customer activated subscription.

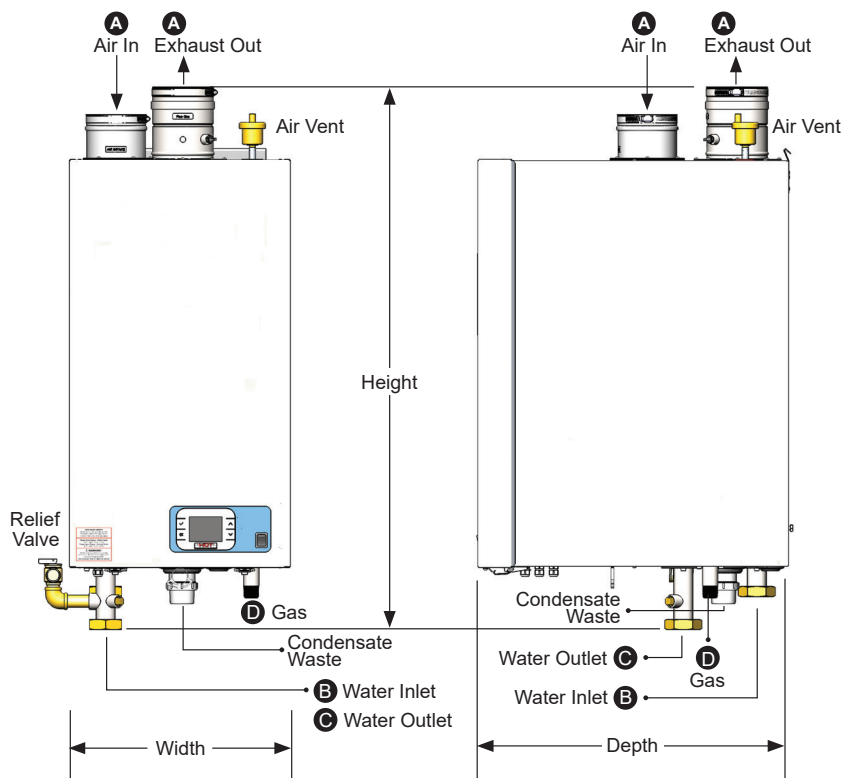


Standard Equipment

- 316L stainless steel water tube heat exchanger, 160 psig (11 barg) ASME H
- 5:1 burner modulation
- Self-diagnostic microprocessor controls
- Externally adjustable set point (0–10v)
- Sealed combustion
- AL29-4L vent materials
- Pressure relief valve
- Inlet & outlet water temperature sensor
- Exhaust temperature sensor
- Gas inlet pressure transducer
- Dual high limit sensor (fixed & adjustable)
- Thermal shock proof heat exchanger
- 10yr. limited heat exchanger warranty
- Common venting on multiple units

Equipment only options:

- Cascade controls
- Condensate neutralizer
- Circulating pump



Heater/Boiler Only														
Model	Width		Height		Depth		A		B		C		D	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
ABH 299	18.9	480	44.9	1140	19.3	490	4	101	1.5	38	1.5	38	.75	19
ABH 399	18.9	480	45.2	1148	19.3	490	4	101	2	50	2	50	.75	19
ABH 599	18.9	480	47.2	1199	27	686	5	127	2	50	2	50	1	25

Heat Exchanger Capacities												
Model	Input		Water Heater* Output		Recovery @ 100°FΔT (55.6 °CΔT)		Recovery @ 80°FΔT (44.5 °CΔT)		Recovery @ 60°FΔT (33.3 °CΔT)		Water Flow Rate & Pressure Drop	
	BTU/hr	kW	BTU/hr	kW	GPH	LPH	GPH	LPH	GPH	LPH	GPM@FT	LPM@M
ABH 299	300,000	88	up to 291,000	up to 85	360	1363	450	1703	600	2271	16.5@22.9'	62@7M
ABH 399	399,999	117	up to 387,999	up to 114	466	1764	582	2203	776	2937	26.4@20.3'	100@6M
ABH 599	630,000	185	up to 611,100	up to 179	734	2778	917	3471	1223	4629	39.6@23.6'	150@7M

• Rates shown are for natural or propane gas, and elevations up to 9000 feet (2743M)

† Individual appliance piping pressure drop used in the tables is based on 20 feet (6M) of straight pipe, 6 elbows, 2 tees, 2 full port ball valves and 2 unions

* At 97% thermal efficiency with 86°F (30°C) incoming water to heat exchanger

- All recovery rates based on domestic water heating
- Dimensions are approximate. Please consult the factory before installation

ABH 299, 399 & 599 - Pre-Piped Configurations

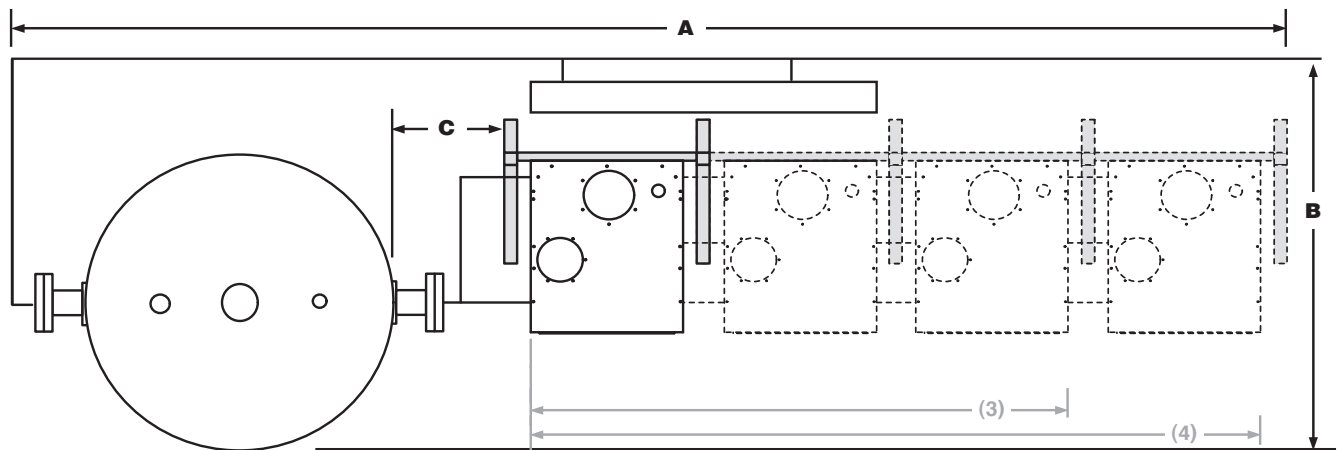
ABH Standard Package Dimensions (See Accompanying Figure 1 below)															
	200 Gallon Tank (32")			220 & 257 Gallon Tank (30")			275 & 350 Gallon Tank (36")			432 & 500 Gallon Tank (42")			650, 750, 1000 Gallon Tank (48")		
Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
(3) ABH 599	N/A	N/A	N/A	163.6	62.2	29.7	169.6	65.2	29.7	175.6	73.9	29.7	182.9	74.4	26.8
(4) ABH 599	N/A	N/A	N/A	191.3	61.1	36.1	197.4	64.1	36.1	203.3	72.9	36.1	213.9	73.2	36.5

	454 Litre Tank (813mm)			833 & 973 Litre Tank (762mm)			1041 & 1325 Litre Tank (914mm)			1635 & 1893 Litre Tank (1067mm)			2460, 2839, 3785 Litre Tank (1219mm)		
Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
(3) ABH 599	N/A	N/A	N/A	4155	1580	754	4308	1656	754	4460	1877	754	4645	1889	681
(4) ABH 599	N/A	N/A	N/A	4859	1552	917	5014	1628	917	5164	1852	917	5433	1859	927

Notes: Consult specific package model submittal drawing for inlet/outlet connection sizes and other dimensions not provided here.

- Dimensions are approximate. Please consult the factory before installation.
- 3 and 4 unit 299 and 399 coming in future development phase

Figure 1



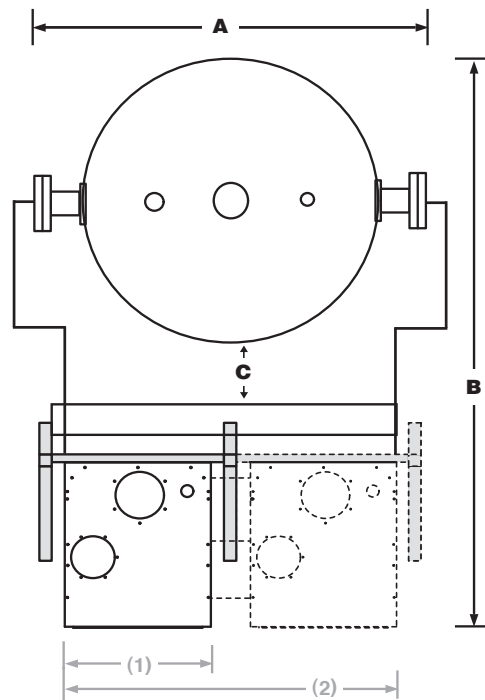
ABH Standard Package Dimensions (See Accompanying Figure 2 Below)

	120 Gallon Tank (28")			175 & 200 Gallon Tank (32")			220 & 257 Gallon Tank (30")			275 & 350 Gallon Tank (36")			432 & 500 Gallon Tank (42")			650, 750, 1000 Gallon Tank (48")		
Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
(1) HW 299	63.5	83.4	12	66.9	85.2	12	67.7	85.2	12	70.7	91.2	12	73.7	115	24	N/A	N/A	N/A
(2) HW 299	78.9	83.4	12	78.9	87.3	12	78.9	85.2	12	78.9	91.2	12	78.9	115	24	N/A	N/A	N/A
(1) HW 399	N/A	N/A	N/A	66.9	90.5	12	69.7	88.5	12	72.7	94.5	12	75.7	118.3	24	83.7	103.1	24
(2) HW 399	N/A	N/A	N/A	77.6	90.5	12	77.8	88.5	12	77.8	94.5	12	77.8	118.3	24	83.3	130.1	24
(1) HW 599	N/A	N/A	N/A	N/A	N/A	N/A	70.3	89.1	12	73.3	95.1	12	76.3	118.9	24	83.4	130.8	24
(2) HW 599	N/A	N/A	N/A	N/A	N/A	N/A	81.5	89.1	12	81.5	95.1	12	81.5	118.9	24	83.4	130.8	24

	454 Litre Tank (711mm)			662 & 757 Litre Tank (813mm)			833 & 973 Litre Tank (762mm)			1041 & 1325 Litre Tank (914mm)			1635 & 1893 Litre Tank (1067mm)			2460, 2839, 3785 Litre Tank (1219mm)		
Model	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
(1) HW 299	1613	2118	305	1699	2164	305	1719	2164	305	1796	2316	305	1872	2921	610	N/A	N/A	N/A
(2) HW 299	2004	2118	305	2004	2217	305	2004	2164	305	2004	2316	305	2004	2921	610	N/A	N/A	N/A
(1) HW 399	N/A	N/A	N/A	1699	2299	305	1770	2248	305	1846	2400	305	1923	3005	610	2126	2619	610
(2) HW 399	N/A	N/A	N/A	1971	2299	305	1976	2248	305	1976	2400	305	1976	3005	610	2116	3305	610
(1) HW 599	N/A	N/A	N/A	N/A	N/A	N/A	1786	2263	305	1862	2415	305	1935	3020	610	2118	3322	610
(2) HW 599	N/A	N/A	N/A	N/A	N/A	N/A	2070	2263	305	2070	2415	305	2070	3020	610	2118	3322	610

ABH Standard Package Utilities

Models & Quantity	Gas Manifold		Common Vent Manifold		Maximum System Amps @ 208V
	in	mm	in	mm	
(1) 299	1	25	N/A	N/A	3.16
(2) 299	1.5	38	5	127	6.32
(3) 299	2	50	6	152	9.48
(4) 299	2	50	7	178	12.64
(1) 399	1	25	N/A	N/A	3.04
(2) 399	2	50	6	152	6.08
(3) 399	2	50	7	178	9.12
(4) 399	2.5	63.5	7	178	12.16
(1) 599	1.25	31.75	N/A	N/A	3.04
(2) 599	2	50	7	178	6.08
(3) 599	2.5	63.5	8	203	9.12
(4) 599	3	76	10	254	12.16


Figure 2