

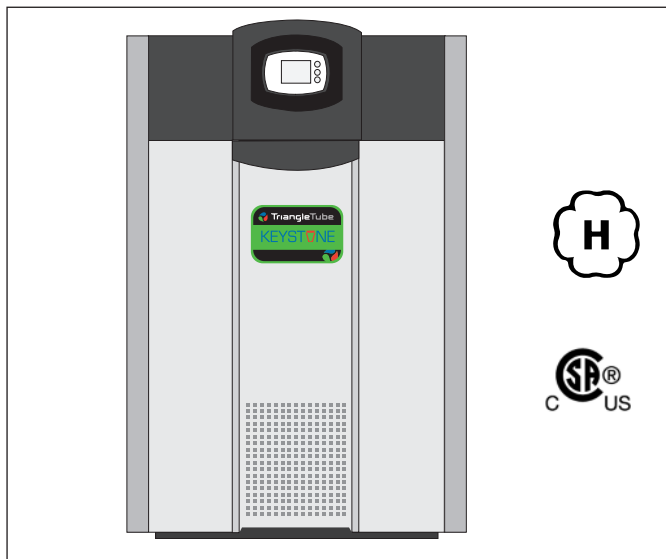
KEYSTONE

Water Heater



Engineering Submittal Data

Sizes: KW 199 - 850



- Horizontal vent and air terminals
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Built-in condensate trap
- Vent temperature cutoff feature
- Direct spark ignition system
- Sensor for domestic water tank included
- 160 psi maximum working pressure
- Stainless steel heat exchanger with welded construction (no gaskets)
- ASME "H" stamp
- 125 psi (861 kPa) ASME rated pressure relief valve
- Water flow switch (KW 399 - 850 only)
- Temperature & pressure gauge
- Drain valve
- Electronic PID modulating control
- Large user-interface and display
- Alarm output
- Accepts external (4-20 mA or 0-10 V with supplemental kit) modulation signal
- On/off service switch
- Manual reset high limit
- Burner site glass
- Zero clearance to combustible surfaces
- Built-in cascade function for up to eight Keystone water heaters
- 5 year limited warranty on heat exchanger

Standard Equipment

- High efficiency condensing Stainless steel heat exchanger
- Modulation down to 20% of full fire (5:1 turndown)
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Low NOx system meets 2012 SCAQMD requirement for air quality - less than 10 ppm NOx
- Horizontal or vertical direct vent

Water Heater Data

Model: _____ Number of units: _____

Sizing Data

Model	Input MBH [kW]	Output MBH [kW]	Thermal Efficiency %	Gas Conn. Sizes Inches	Water Conn. Sizes Inches	Shipping Weight Lbs [Kg]
KW 199	199 [58.3]	193 [56.6]	97.0	1/2 NPT	1 1/4 NPT	246 [111]
KW 285	285 [83.5]	272 [79.8]	95.6	3/4 NPT	2 NPT	276 [125]
KW 399	399 [117.0]	374 [109.7]	96.3	3/4 NPT	2 NPT	346 [157]
KW 500	500 [147.0]	483 [141.7]	96.7	1 NPT	2 NPT	381 [173]
KW 600	600 [175.8]	576 [167.0]	95.3	1 NPT	2 NPT	390 [177]
KW 750	750 [219.8]	723 [208.9]	96.6	1 1/2 NPT	2 NPT	454 [206]
KW 850	850 [249.1]	810 [236.7]	95.7	1 1/2 NPT	2 NPT	493 [224]

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Clearances and Electrical Data

Appliance Surface	Suggested Service Access Clearance inches [cm]
Left Side	1 [2.5]
Right Side	12 [31]
Top	24 [61]
Back	6 [15]
Closet, Front	6 [15]
Alcove, Front	24 [61]
Vent	N/A

Sizes	Boiler			Pump Connections Ratings (System Pump and DHW Pump Connections)
	Volts	Phase	Amps	
KW 199 - 850 No Pump	120	Single	2*	N/A

* Minimum 15A circuit required

Vent System

Size	Intake (Air) Pipe	Exhaust (Vent) Pipe	Maximum Allowable Equivalent Length* Ft [m]
KW 199	3"	3"	100 [30]
KW 285	3"	3"	20 [6.1]
	4"	4"	100 [30]
KW 399	4"	4"	100 [30]
KW 500	4"	4"	100 [30]
KW 600	4"	4"	40 [12]
	6"***	6"***	100** [30]**
KW 750	4"	4"	40 [12]
	6"	6"	100 [30]
KW 850	4"	4"	40 [12]
	6"	6"	100 [30]
Installations in the U.S. require exhaust vent pipe that is a combination of PVC & CPVC complying with ANSI/ASTM D1785. F441, polypropylene pipe that complies with ULC S636, or stainless steel complying with UL1738. Installations in Canada require exhaust vent pipe that is certified to ULC S636.			
Intake (air) pipe may be ABS, PVC, CPVC or galvanized material.			
Installer must comply fully with manufacturer's installation instructions, including use of minimum exhaust length CPVC, to maintain ANSI Z21.13 safety certification			
Closet and alcove installations do not allow the use of PVC under any circumstances			
* To calculate max equivalent length, measure the linear feet of the pipe, and add 5 feet (1.5 m) for each elbow used.			
** Allowed only if the vent pipe is no more than 20 equivalent feet longer than the air pipe			

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Recovery Data

Required Water Temperature Rise GPH delivered [L/h delivered]									
Size	40°F [22°C]	50°F [28°C]	60°F [33°C]	70°F [39°C]	80°F [44°C]	90°F [50°C]	100°F [56°C]	120°F [67°C]	140°F [78°C]
	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]	Flow gph [L/h]
KW 199	579 [2190]	463 [1752]	386 [1460]	331 [1251]	290 [1095]	257 [973]	232 [876]	193 [730]	166 [626]
KW 285	818 [3091]	654 [2473]	545 [2061]	467 [1766]	409 [1545]	363 [1374]	327 [1236]	273 [1030]	234 [883]
KW 399	1153 [4359]	923 [3487]	769 [2906]	659 [2491]	577 [2181]	513 [1937]	461 [1744]	384 [1453]	329 [1245]
KW 500	1451 [5485]	1161 [4388]	967 [3657]	829 [3134]	726 [2743]	645 [2438]	580 [2194]	484 [1828]	415 [1567]
KW 600	1729 [6536]	1383 [5288]	1152 [4355]	988 [3735]	864 [3266]	768 [2903]	691 [2612]	576 [2177]	494 [1867]
KW 750	2170 [8203]	1736 [6562]	1447 [5470]	1240 [4687]	1085 [4101]	964 [3644]	868 [3281]	723 [2733]	620 [2344]
KW 850	2434 [9201]	1947 [7360]	1622 [6131]	1391 [5258]	1217 [4600]	1082 [4090]	973 [3678]	811 [3066]	695 [2627]

Water Flow Requirements

Size	Flow gpm [lpm]	H/L feet [m]	Temp. Rise °F [°C]
KW 199	25 [95]	28 [8.5]	15 [8]
KW 285	36 [137]	33 [10.1]	15 [8]
KW 399	50 [189]	35 [10.7]	15 [8]
KW 500	63 [239]	28 [8.5]	15 [8]
KW 600	60 [227]	24 [7.3]	19 [11]
KW 750	68 [257]	35 [10.7]	21 [12]
KW 850	68 [257]	26 [7.9]	24 [13]

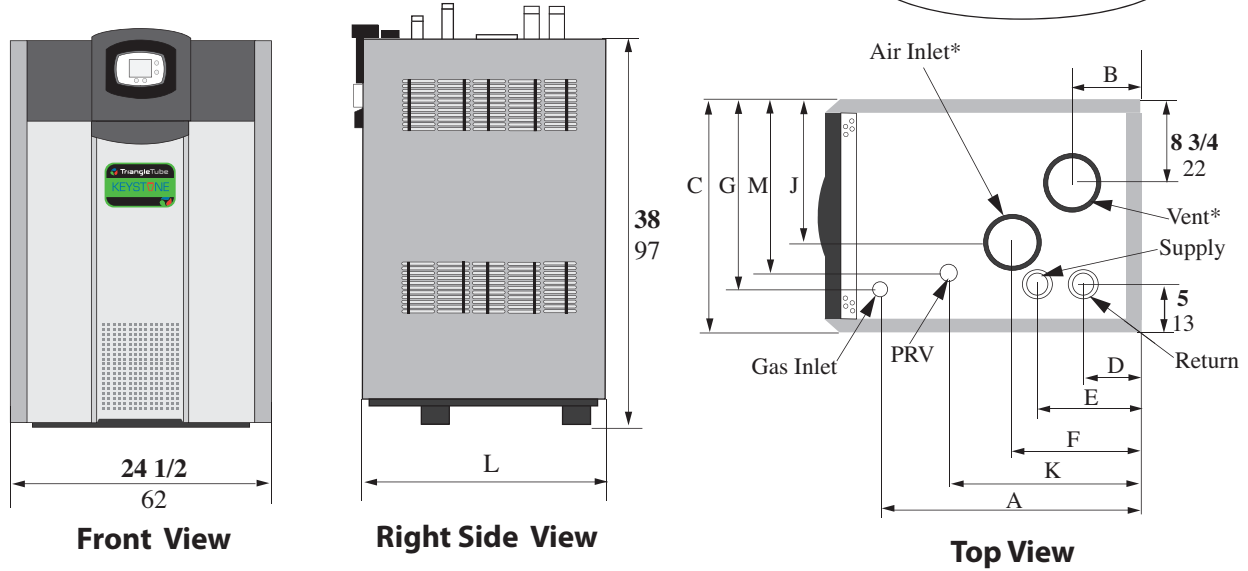
Note: Maximum allowed Water Hardness of 10 grains per gallon.

Accessories for Field Mounting

- ☐ Water flow switch (199 - 285 only)
 ☐ Low water cutoff
 ☐ High & low gas pressure switches
 ☐ Additional auto reset high limit

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Dimensional Data - Sizes 199 - 500



KW Size	A		B		C		D		E		F		G		J		K		L		M	
	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm	in	cm
199	20 1/2	52	5 1/4	14	19	48	3 1/4	8	17 3/4	45	7 1/2	19	14 1/4	36	19 1/2	49	11 3/4	30	26 1/4	68	15 1/4	39
285	20 1/4	52	7 1/4	19	19 1/2	50	6	16	11 1/4	29	13 1/2	34	14	36	15	38	17	43	26 1/4	68	18 3/4	48
399	25	64	5 1/4	13	19 1/2	50	4 1/4	11	14 1/2	37	18 1/2	47	19 1/4	49	16 1/2	42	21 3/4	55	31 1/2	80	18 3/4	48
500	30 1/4	77	5 1/4	13	19 1/2	50	4 1/4	11	15 1/4	38	20	51	20 1/2	52	19	48	26	66	37 3/4	96	18 3/4	48
600	29 3/4	76	5	13	19 1/2	50	4 1/4	11	15	38	20	51	3	8	19	48	26	66	37 3/4	96	18 3/4	48
750	35 1/2	90	6	15	19 1/2	50	5 1/4	13	19	48	40 1/2	103	3 1/4	8	19	48	30 3/4	78	51	130	18 3/4	48
850	39 3/4	101	6	15	19 1/2	50	5 1/4	13	19	48	44	114	3 1/2	9	19	89	35	89	55 1/4	140	18 3/4	48

* Keystone is shipped with adapters for the air and vent connections that accept standard pipe of the proper size and type.