

## CONSERVATIONIST® COMMERCIAL BOILERS

*Energy Saving Product*

### 80% THERMAL EFFICIENCY

#### FEATURES

**COMPLIANCE** – These models meet the thermal efficiency and standby loss requirements of the U.S. Department of Energy and current edition ASHRAE/IESNA 90.1.

**ALL NON-FERROUS WATERWAYS** – All castings are made of Bronze or Brass. All water tubes are made from copper. Brazed joints or flare union construction make the heater immune to the effects of thermal shock and thermal cycling. A great boiler for domestic hot water supply systems.

**EFFICIENT COPPER COIL COMBUSTION CHAMBER** – The combustion chamber is a heat exchanger formed from a two passage coil of tightly wound continuous copper tube. Water circulating through this coil surrounds the main burner and captures the radiant heat. A wrap of insulation on the outside of the coil retains the heat captured by the circulating water.

**COPPER HEAT EXCHANGER** – Directly above the coil and the main burner is a compact, horizontal, copper fin tube heat exchanger. The flue gases must pass through this efficient heat exchanger before leaving the boiler. This unique Burkay coil and heat exchanger design provide maximum heat transfer and proven field durability.

**BURKAY BURNER MAXIMIZES EFFICIENCY** – The patented Burkay burner uses primary air injection at up to 72 individual orifices plus secondary entrainment of air. Approved for installation on combustible floors as shipped from factory.

**GAS VALVES** – Slow opening redundant gas valves ensure smooth light-off without flame roll-out or pilot outage.

**THERMAL BALANCER** – Patented pump delay system that allows boiler and pump to run simultaneously but delays pump shut off at end of heating cycle to remove usable heat from the heat exchanger and reduce the scale forming tendencies of motionless hot water.

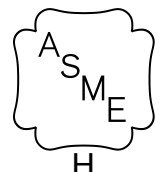
**AUTOMATIC SAFETY CONTROLS AND ELECTRONIC IGNITION** – Proven pilot ignition system provides flame failure response in under one (1) second. Redundant high limit controls and gas valves assure safe shutoff in the event of overheating or flame failure. Requires 120V 60Hz, maximum inlet gas pressure of 14" WC and activation of heater by external temperature control.

**WORKING PRESSURE** – ASME approved, hydrostatically tested and certified for 160 psi.

**LIMITED WARRANTY OUTLINE** – Consult written warranty or A. O. Smith.

## HW-300 THRU HW-670

HW - INDOOR  
INSTALLATION  
ONLY



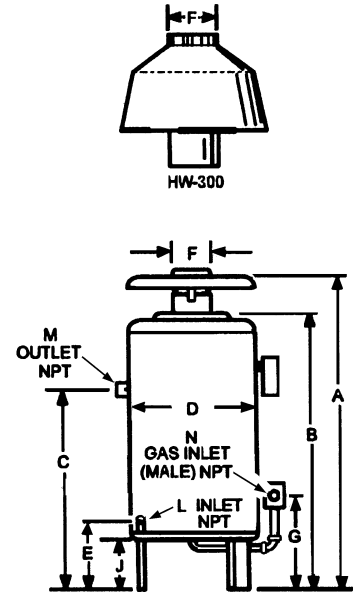
Low Lead Content

**TABLE 1. DIMENSIONS AND CAPACITY DATA**

DIMENSIONS IN INCHES		MODELS				
		HW-300	HW-399	HW-420	HW-520	HW-670
A	Overall height	65 (1651)	57-1/8 (1451)	57-1/8 (1451)	68-5/16 (1735)	68-5/16 (1735)
B	Height to Top of Jacket	43-1/4 (1099)	45-1/8 (1146)	45-1/8 (1146)	56-1/4 (1429)	56-1/4 (1429)
C	Floor to Center Line Water Inlet	36 (914)	38-3/4 (984)	38-3/4 (984)	46 (1168)	46 (1168)
D	Diameter of Jacket	25-1/4 (641)	27 (686)	27 (686)	27 (686)	27 (686)
E	Floor to Center Line Water Outlet	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)
F	Draft Diverter Outlet Diameter	8 (203)	10 (254)	10 (254)	10 (254)	12 (305)
G	Floor to Center Line Gas Inlet	16-1/2 (419)	16-3/4 (425)	16-3/4 (425)	18 (457)	18 (457)
H	Overall Depth	29-5/8 (753)	31-1/2 (800)	31-1/2 (800)	36-1/2 (927)	36-1/2 (927)
J	Support Height	9 (229)	9 (229)	9 (229)	9 (229)	9 (229)
K	Width of Control String (approx.)	14 (356)	14 (356)	14 (356)	11 (279)	11 (279)
L	Pipe Size of Water Inlet (NPT)	1-1/4	1-1/2	1-1/2	2	2
M	Pipe Size of Water Outlet (NPT)	1-1/4	1-1/2	1-1/2	2	2
N	Pipe Size of Gas Inlet (NPT)	3/4	3/4	1	1	1
P	Control String Plus 1/2 Jacket Diameter (approx.)	26-5/8 (676)	27-1/2 (699)	27-1/2 (699)	24-1/2 (622)	24-1/2 (622)
S	Horizontal Length between Water Inlet and Outlet	5-3/8 (137)	5-1/2 (140)	5-1/2 (140)	5-3/4 (146)	5-3/4 (146)
T	Control String from Jacket	5 (127)	5 (127)	5 (127)	7 (178)	7 (178)
	Approximate shipping weight lbs. (Kilograms)	250 (113)	301 (137)	301 (137)	381 (173)	381 (173)

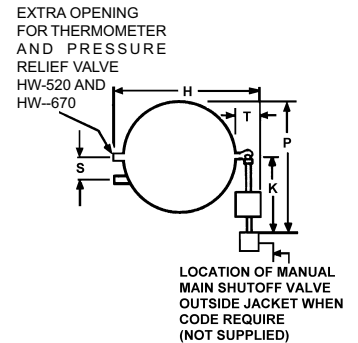
**NOTE:** All dimensions in inches (millimeters) except pipe size which is NPT

**FIGURE 1. DIMENSIONS**



**TABLE 2. FLOW, HEAD AND TEMPERATURE RISE**

BTU INPUT/OUTPUT			TEMPERATURE RISE AND PRESSURE DROP					
			20 DEG. F RISE		30 DEG. F RISE		40 DEG. F RISE	
MODELS	INPUT RATING BTU/HR NATURAL & PROPANE (LP) GAS	OUTPUT RATING BTU/HR NATURAL & PROPANE (LP) GAS	GPM	PD-FT HEAD	GPM	PD-FT HEAD	GPM	PD-FT HEAD
HW 300	300,000	240,000	24	8	16	3	12	2
HW 399	399,000	319,200	32	16	21	7	16	5
HW 420	420,000	336,000	34	18	22	8	21	5.5
HW 520	520,000	416,000	42	12	28	5	26	4
HW 670 Nat	660,000	528,000	53	22	35	10	26	5.5
HW 670 Prop	670,000	536,000	54	22	36	10	27	5.5



**TABLE 3. RECOVERY CAPACITIES**

Models	Type of Gas	Input		°F	20	40	50	60	70	80
		Btu/hr	kW		°C	(11)	(22)	(28)	(33)	(39)
HW 300	Natural	300,000	88	GPH	1,455	727	582	485	416	364
	LPH			5,506	2,753	2,202	1,835	1,573	1,377	
HW 399	Natural	399,000	117	GPH	1,935	967	774	645	553	484
	LPH			7,323	3,662	2,929	2,441	2,092	1,831	
HW 420	Natural	420,000	123	GPH	2,036	1,018	815	679	582	509
	LPH			7,708	3,854	3,083	2,569	2,202	1,927	
HW 520	Natural	520,000	152	GPH	2,521	1,261	1,008	840	720	630
	LPH			9,544	4,772	3,818	3,181	2,727	2,386	
HW 670	Natural	660,000	193	GPH	3,200	1,600	1,280	1,067	914	800
				LPH	12,113	6,057	4,845	4,038	3,461	3,028
HW 670	Propane	670,000	196	GPH	3,248	1,624	1,299	1,083	928	812
				LPH	12,297	6,148	4,919	4,099	3,513	3,074

**SUGGESTED SPECIFICATION**

Boiler(s) for hot water supply purposes shall be Model(s) No. \_\_\_\_\_ as manufactured by A. O. Smith or an approved equal. Boiler(s) shall be gas-fired, and design certified by an ANSI approved/accredited independent rating laboratory, capable of supplying \_\_\_\_\_ gph at 100°F temperature rise equipped to burn \_\_\_\_\_ gas, with input rating of \_\_\_\_\_ BTU/hr. and bearing the ASME code symbol. Boiler(s) shall be up flow type having all non-ferrous waterways, and employing a copper finned heat exchanger and a tightly wound copper coil combustion chamber with 160 psi working pressure rating. Boiler(s) shall be equipped with an electric gas valve of the step-opening type, an adjustable limit control which will break the electric circuit on temperature rise, intermittent ignition with one (1) second shutdown in the event of pilot flame failure, a gas pressure regulator properly set for the gas to be supplied, and a coil limit switch for shut off in event of excessive water temperature, a certified draft diverter and a fully illustrated instruction manual. Certified for combustible flooring. Outer jacket shall be of baked enamel finish. The coil, heat exchanger and burner shall have a five year limited warranty as outlined in the written warranty.