

# **BURNHAM®**

## **Commercial Boilers**

### **HIGH EFFICIENCY**

POSITIVE  
WATER FLOW  
CIRCULATION

DURABLE

5 SQ. FT./HP  
RATED

NON-CORROSIVE



## **Series 4S**

### **4-PASS WATERBACK SCOTCH BOILER**

# 4-Pass WATERBACK SCOTCH BOILER

## America's Boiler Company

The Burnham Commercial Series 4S four-pass waterback scotch boiler is sold and serviced through the largest and most experienced network of sales representatives in the country. With a complete commercial product offering and unmatched sales and technical support, it's no wonder why we are America's Boiler Company!

## Why Choose the Series 4S?

- The design incorporates positive water flow circulation and maximum heat transfer to maximize ratings.
- The handhole clean-outs are placed for ease of servicing.
- All external trim piping is designed and installed in accordance with the ASME Code and is certified by an independent inspection agency for compliance.
- The fiberglass insulated steel jacket is finish painted with high gloss Burnham Commercial blue enamel.
- The front and rear full-sized hinged access doors are standard and secured with non-corrosive brass nuts.
- The UL approved packaged burners are trimmed and wired to assembled gas trains.
- *The access door is constructed of durable, lightweight vacuum formed ceramic fiber—the door liner weighs less than 10 pounds!*



- The heavy steel base provides adequate stability along with shipping and rigging protection.
- It is completely packaged and ready for "same day" installation.
- The 5 sq.ft./hp rated design does not use turbulators or welded tube ends.
- QC checkpoints and stringent final inspection assures you of a quality product.
- There are no proprietary parts or gaskets on the boiler trim or the burner.

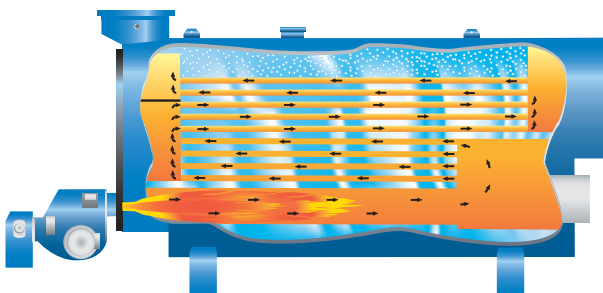
## Latest Design Techniques

The Series 4S uses the very latest design techniques and standards. Its furnace, the workhorse of the boiler, is designed for low volumetric release rates of no more than 136,000 btu/hr/cu.ft. The lower the release rates, the "easier" your boiler works. As your boiler works easier, less stress is put upon the steel, tube ends, refractory, etc., resulting in a longer lasting boiler. In addition to longevity, a larger furnace makes for ease in firing using any selected burner vendor. The Series 4S is also easily converted to a Low NOx product when needed.

## Higher Efficiency

The Burnham Commercial Series 4S design produces a higher efficiency due to the larger furnace and higher heat transfer design. To determine the efficiency of your next job, contact your local Burnham Commercial representative.

## 4-Pass Waterback Scotch Boiler



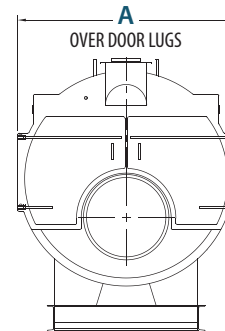
To learn more about waterback versus dryback, please refer to our website at [www.burnhamcommercial.com](http://www.burnhamcommercial.com).

# Series 4S DIMENSIONS AND RATINGS

## DIMENSIONS

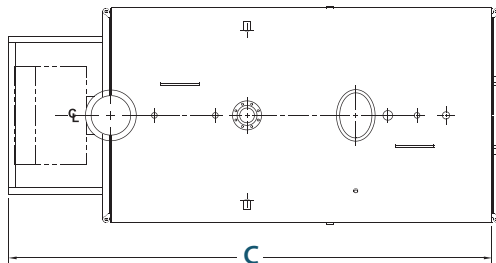
	100	125	150	175	200	250	300	350	400	500	600	700	800
A	68	68	76	76	76	86	86	94	94	104	104	114	114
B	85	85	93	93	93	103	103	111	111	121	121	131	131
C	150	176	169	188	207	207	235	240	263	264	300	282	311

Dimensions are approximate, see detailed drawings for more specific dimensions.

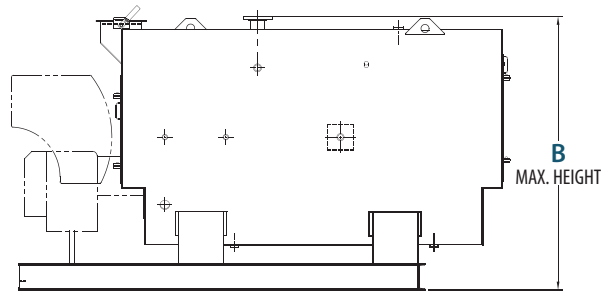


**FRONT VIEW**

Specifications subject to change without notice.  
All connections are threaded unless otherwise specified.



**PLAN VIEW**



**SIDE VIEW**

## RATING DATA

Boiler Size - HP	100	125	150	175	200	250	300	350	400	500	600	700	800
Shell Diameter	62	62	70	70	70	80	80	88	88	98	98	108	108
Heating Surface - FS Sq. Ft.	500	625	750	875	1,000	1,250	1,500	1,750	2,000	2,500	3,000	3,500	4,000
Furnace Volume - Cu. Ft.	39	46	58	66	73	93	108	133	149	177	206	219	246
Heat Releases Rate BTU/Hr./Cu. Ft.	107,618	112,686	108,471	111,565	114,003	112,617	116,193	110,011	112,491	118,528	121,670	133,559	136,013
Water Content Flooded Gal. NWL Gal.	874 775	1,107 984	1,183 1,008	1,389 1,186	1,595 1,365	1,899 1,596	2,290 1,930	2,657 2,264	3,047 2,600	3,531 2,811	4,254 3,395	4,737 3,872	5,425 4,447
Shipping Weight - Lbs. 15/30 psi 125/150 psi	8,400 9,600	9,700 11,200	10,900 12,200	12,400 13,700	13,600 15,000	16,500 19,700	19,000 22,600	23,200 26,100	25,500 28,600	30,400 34,300	35,800 39,700	39,900 46,700	44,200 51,700

Model	INPUTS			OUTPUT				GAS EFFICIENCIES				OIL EFFICIENCIES				IBR NET RATING		
	Gas Input MBH	Oil Input MBH	Oil Input GPH	Water		Steam		Water		Steam		Water		Steam		Steam MBH	Steam SQ FT	Water MBH
				MBH	BHP	MBH	BHP	Lb./Hr.	Comb. Eff. %	Therm. Eff. %	Comb. Eff. %	Therm. Eff. %	Comb. Eff. %	Therm. Eff. %	Comb. Eff. %			
4S-100	4,184	4,032	28.8	3,552	106.1	3,506	104.7	3,614	85.1	84.9	84.3	83.8	88.2	88.0	87.4	2,722	11,342	3,089
4S-125	5,230	5,068	36.2	4,451	133.0	4,409	131.7	4,544	85.7	85.1	85.0	84.3	88.5	87.8	87.0	3,423	14,263	3,870
4S-150	6,277	6,062	43.3	5,298	158.3	5,248	156.8	5,409	85.1	84.4	84.4	83.6	88.1	87.4	87.3	4,074	16,976	4,607
4S-175	7,323	7,084	50.6	6,239	186.4	6,181	184.6	6,370	85.8	85.2	85.0	84.4	88.6	88.0	87.8	4,799	19,994	5,425
4S-200	8,369	8,120	58.0	7,172	214.3	7,105	212.3	7,323	86.3	85.7	85.5	84.9	89.0	88.4	88.1	5,517	22,986	6,237
4S-250	10,461	10,122	72.3	8,923	266.6	8,840	264.1	9,111	85.9	85.3	85.1	84.5	88.7	88.1	87.9	6,863	28,596	7,759
4S-300	12,553	12,166	86.9	10,796	322.5	10,695	319.5	11,023	86.5	86.0	85.8	85.2	89.2	88.7	88.4	8,304	34,599	9,387
4S-350	14,645	14,196	101.4	12,580	375.8	12,463	372.3	12,845	86.4	85.9	85.6	85.1	89.1	88.6	88.3	9,676	40,317	10,939
4S-400	16,738	16,226	115.9	14,445	431.5	14,311	427.5	14,750	86.8	86.3	86.1	85.5	89.5	89.0	88.6	11,111	46,296	12,561
4S-500	20,922	20,286	144.9	18,014	538.1	17,846	533.1	18,393	86.6	86.1	85.8	85.3	89.3	88.8	88.5	13,856	57,733	15,664
4S-600	25,106	24,346	173.9	21,742	649.5	21,566	644.2	22,227	87.1	86.6	86.4	85.9	89.7	89.3	88.9	16,744	69,766	18,906
4S-700	29,291	28,364	202.6	25,278	755.1	25,044	748.1	25,811	86.8	86.3	86.0	85.5	89.5	89.1	88.7	19,444	81,016	21,981
4S-800	33,475	32,466	231.9	29,023	867.0	28,789	860.0	29,670	87.2	86.7	86.4	86.0	89.8	89.4	88.9	22,351	93,130	25,237

For steam pressure ratings above 15 psig, please consult the factory.

# Series 4S STANDARD EQUIPMENT

## Boiler:

Four-pass full waterback firetube type, constructed in accordance with requirements of the ASME Code, Section IV for 30 PSI and 125 PSI water or 15 PSI steam; Section I for higher pressure steam. All units are registered with the National Board.

Turbulator baffles are not used in tubes. Separate rear tube sheets allow safe expansion and contraction.

Waterbacked rear turnaround promotes rapid internal circulation and reduces gas temperatures at the entrance to the second pass, reducing tube end stress.

Easy opening hinged, insulated front flue doors with lightweight non-refractory closure provide full access to all tubes. A lightweight 16-inch diameter bolted rear access door with observation port provides access to the boiler furnace. Rear tube access is provided by removing lightweight gasketed doors(s) installed on the rear smokebox. No elaborate seals are used.

A manhole is furnished as standard. Handhole washouts are provided for easy inspection and cleaning of waterside surfaces.

All steam boilers are provided with a dry pan to ensure dry steam. A feedwater diffuser is provided on high-pressure boilers. All water boilers are equipped with a dip tube at supply outlet and diffuser at return inlet.

The round-flanged vertical smoke outlet is equipped with a quadrant damper. All boilers are provided with an enameled steel jacket installed over 2 inches of fiberglass insulation and lifting lugs.

The boiler is mounted on a heavy-duty structural steel base with extended skid and burner platform for protection of the burner during shipment and rigging.

## Standard Trim and Controls:

**Steam:** 157 pump control/low water cut-off with alarm contacts—piped with quick opening blowoff valve. Gauge glass set with hand-operated gauge and try cocks. Steam pressure gauge—4.5-inch dial on sizes 125 HP and smaller, 6-inch dial on larger sizes. Operating pressuretrol, manual reset high limit pressuretrol and appropriate firing rate control when required. Manual reset probe auxiliary low water cut-off.

ASME side outlet safety valve(s).

**Water:** 63M manual reset low water cut-off with 30 PSI units, 150M low water cut-off with higher pressure units—piped with quick opening blowoff valve. Combination pressure/temperature gauge—3.5-inch dial on 125 HP and smaller. On larger sizes a 6-inch combination pressure/altitude gauge and 5-inch dial temperature gauge. Operating aquastat and manual reset high limit aquastat and appropriate firing rate control when required.

ASME side outlet relief valve(s).

## Burner Equipment:

Burner mounts directly to the front head of the boiler with no elaborate seals.

Factory packaged units available with forced draft burners for all commonly used fuels—gas, all grades of oil—No. 2 through No. 6—or combination gas/oil. Choice of pressure or air atomizing burners for No. 2 oil. Gas burners are available for either natural or LP gas.

Refer to burner data sheets for standard burner equipment and operating sequence.

## Accessories and Optional Equipment:

Accessories and optional equipment available at extra cost, including, but not limited to:

- Alternate or additional water level controls or low water cut-offs
- Built-in tankless heater coils—low-pressure boilers only
- Motorized or pneumatic feed valves
- Surface skimmers and blowoff valves
- Bottom blowdown valves and drain valves
- Feed stop and check valves
- Sequence draft controls
- Lead/lag sequencing systems
- Boiler feed systems
- Low NOx burners
- Deaerators
- Water softeners
- Chemical feed systems
- Blowdown systems
- Sample coolers



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