



Improving Life Through Heat Transfer Solutions

Industrial /Commercial Division
The Fulton Companies
**Fulton FB-S
Horizontal Fuel-Fired
Steam Boiler**

Capacity Range From 60-400 BHP



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Fulton China LLC is part of the Fulton Companies
manufactures high grade industrial/commercial heat
transfer products

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FBS 3 pass/wet-back/ corrugated furnace steam boiler

Design Feature

- FB-S boiler is a three- pass, wet-back, and corrugated furnace design boiler with generous heating surface.
- Standard maximum working pressure of 1.04 MPa (150psi) ,other pressure is available upon request.
- Compact design minimizes foot print and easy to fit in a container.
- Seamless tubes 15% thicker than the competitors.
- Welded tubes avoid the problem of leaking caused by shipping normally seen in rolled tubes.
- Alternate fuel capability: Light oil, Heavy oil, Natural gas, Town gas and LPG.
- 3 year warranty on pressure vessel backed by Fulton worldwide service and spares system.
- Optional 4-pass and wetback design with corrugated furnace and more heating surface (above 5 SQ.FT/BHP), higher efficiency.
- Low Nox emission option for nature gas fuel.

Operating Principle

The standard design for FB-S is a three-pass, wet-back with corrugated furnace. In the first pass, the flame and high temperature flue gas flow from the front to the back of the furnace; Through the second pass tubes, high temperature flue gas flows from the return chamber to the front chamber; In the third pass, the flue gas passes through the third pass tubes to the back of the boiler stack and then vents out.

Corrugated furnace and wet-back design

FB-S boiler's large diameter corrugated furnace provides a generous heating surface for increased heat transfer and reduced heat flux. The corrugation also reinforces the strength of the combustion chamber, and increases the longevity of the pressure vessel due to a substantial reduction in thermal and mechanical fatigue caused by cyclic expansion and contraction. The wet-back design eliminates heavy refractory on rear door while increasing efficiency and reducing radiant loss.



Standard Nuway Burner



FB-S with optional IC burner



Large Water Content

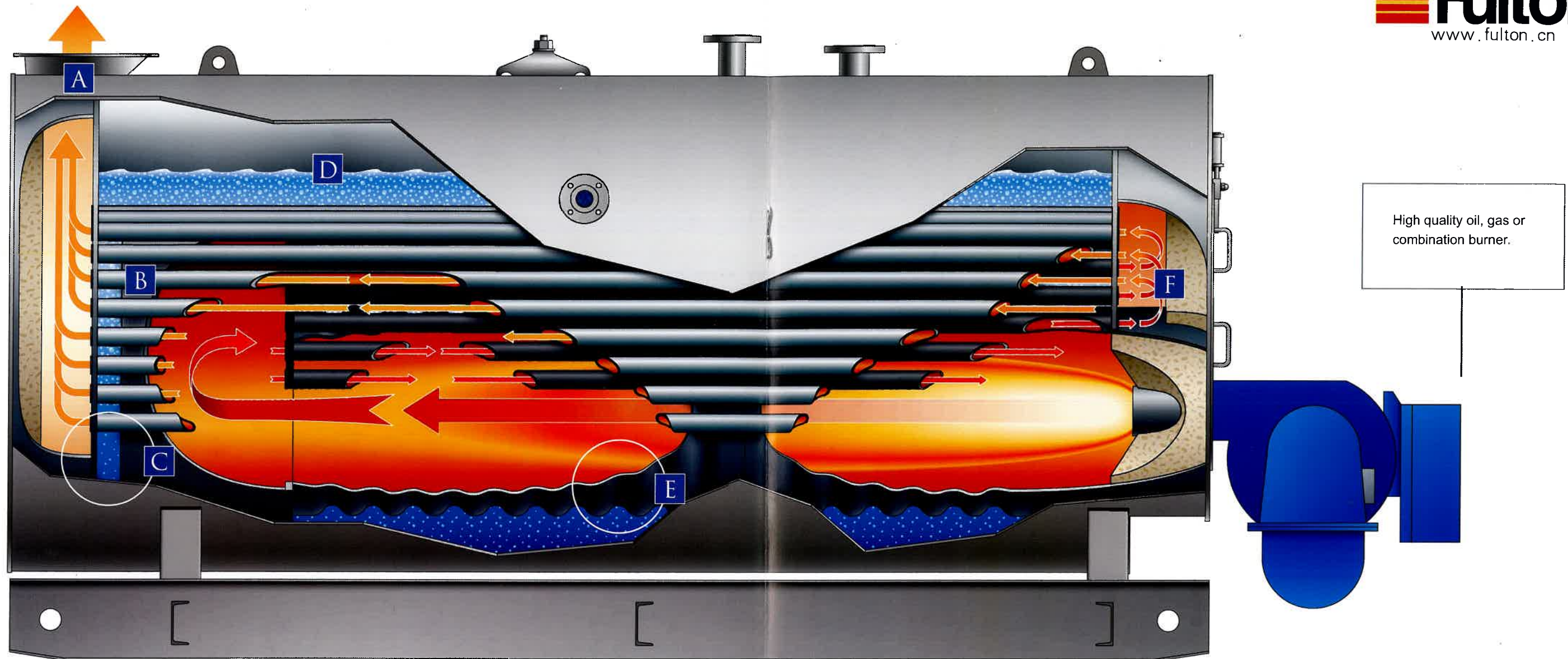
FB-S boiler's large water content and steam chamber ensure low sensitivity to load change, and stability of steam pressure & steam quality. Combustion chamber located well below water level with generous clearance from bottom of boiler allowing proper circulation. Adequate space between combustion chamber and water level ensures high quality steam by minimizing carry over.

Well-insulated Front Gas Chamber

Gas chamber is not a part of the pressure vessel, but plays an important role in boiler operation. Fulton utilizes the "air-insulation" design to reduce heat loss in its FB-S series boiler. The large furnace surface area also reduces furnace exit temperature via enhanced radiation and convection.



FB-S standard panel pox



A Rear stack connection for easy venting.

B Multiple banks of heavy gauge seamless boiler tubes used in the second and third flue pass ensure durability.

C Water-backed design eliminates heavy refractory on rear door while increasing efficiency and reducing radiant heat loss.

D Large water volume and generous steam chamber ensure low sensitivity to load change and pressure vessel stability.

The combustion chamber is located below the water level and with enough clearance from the bottom of the boiler to allow for optimal water circulation. The low placement of the combustion chamber provides an additional buffer between the furnace and the water level, providing higher quality steam.

E The large diameter corrugated combustion chamber provides a generous heating surface area. This enhances heat transfer while reducing heat flux. In addition to reinforcing the overall strength of the combustion chamber, the corrugation also increases the longevity of the pressure vessel. This is due to substantial reduction in thermal and mechanical fatigue caused by cyclical expansion and contraction.

F The large surface area of the boiler initially reduces exit temperatures through enhanced radiation and convection. Radiant heat losses from the gas chamber are then minimized by heavy insulation on the front door. This also helps to reduce the temperature of the front door. The gas chamber is air insulated to reduce heat exchange loss. Though it is not a part of the pressure vessel, it does play a crucial role in the boiler design.

FB-S Boiler Dimension

Model		FBS60	FBS100	FBS125	FBS150	FBS200	FBS250	FBS300	FBS400
A: Boiler length (IC)	mm	4830	5050	5450	5450	5710	6040	7415	7800
	inch	190	199	215	215	225	237	292	307
A: Boiler length (NUWAY)	mm	4610	4900	5300	5315	5570	5815	7010	7340
	inch	181	193	209	209	219	229	275	289
B: Boiler width	mm	2040	2140	2162	2162	2140	2350	2352	2440
	inch	80	84	85	85	84	93	93	96
C: Boiler height	mm	2080	2230	2190	2190	2180	2420	2420	2430
	inch	82	88	86	86	86	95	95	96
D: Pipe replacing distance	mm	2930	3131	3491	3491	3530	4121	5316	5620
	inch	115	123	137	137	139	162	209	221
E: Boiler diameter	mm	1733	1833	1833	1833	1833	1983	1983	2150
	inch	68	72	72	72	72	78	78	85
F: Boiler base length	mm	4155	3770	4130	4130	4430	5300	6540	6870
	inch	164	148	163	163	175	208	258	270
G: Boiler base width	mm	1316	1460	1450	1450	1450	1550	1556	1600
	inch	52	58	57	57	57	61	61	63
H: Stack diameter	mm	350	350	400	400	450	500	500	550
	inch	14	14	16	16	18	20	20	22

Electrical Requirement

IC Burner 110V/440V/60Hz	Light oil	3	3	4.5	4.5	6.38	9	12.75	12.75
	kw								
	Natural gas	2.25	2.25	3.75	3.75	5.63	7.5	11.25	11.25
	kw								
	Heavy oil	7.13	7.13	8.63	9.38	13.25	15.13	20.38	20.38
	kw								
Nu-way Burner 220V/380V/50Hz	Light oil	2.2	3	4	7.5	7.5	12.1	12.1	12.1
	kw								
	Natural gas	1.1	3	3	4	7.5	11	11	11
	kw								
	Heavy oil	6.7	9	10	15	16.5	21.1	21.1	24.1
	kw								
Water pump 380V	Grundfos 50Hz	1.1	1.5	2.2	2.2	3	3	4	4
	kw								
	60Hz	1.1	2.2	2.2	2.2	2.2	4	4	4
	kw								
	Fuiton 50Hz	1.5	2.2	2.2	3	3	4	4	5.5
	kw								

FBS Boiler Specification

Model	FB-S	FBS60	FBS100	FBS125	FBS150	FBS200	FBS250	FBS300	FBS400
Nominal steam output(1)	Kg/hr	939	1566	1958	2350	3133	3916	4699	6266
	KBtu/hr	2008	3347	4184	5021	6694	8369	10041	13388
Operating pressure	MPa	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
	psi	150	150	150	150	150	150	150	150
Operating steam temperature(saturation)	°C	184	184	184	184	184	184	184	184
	°F	363	363	363	363	363	363	363	363
Fuel consumption at rated output-applicable under altitude 610m									
Light diesel oil	Kg/h	51.9	86.6	108.3	130	173.3	216.6	260	346.6
	U.S.GL/hr	15.9	26.5	33.1	39.8	53.0	66.3	79.5	106.0
Heavy diesel oil	Kg/h	53.1	88.5	110.7	132.8	177.1	221.3	265.5	354.2
	U.S.GL/hr	14.2	23.8	29.7	35.7	47.5	59.4	71.3	95.1
Town gas	m³/h	161.6	269.5	337	404.4	539.1	673.9	808.6	1078.3
	ft³/h	5706	9517	11899	14281	19039	23797	28556	38078
Natural gas	m³/h	65.4	108.9	136.3	163.6	218.1	272.6	327.1	436.1
	ft³/h	2308	3849	4812	5776	7701	9625	11550	15401
Water content(full)	L	3570	4260	4740	4630	4460	6370	8080	9350
	U.S.Gallon	942	1125	1252	1223	1178	1680	2130	2465
Gross weight	t	5.8	7.8	8.3	8.5	9.2	11.62	15.16	17.83
	lbs	12787	17196	18298	18739	20282	25617	33422	39308

Note: 1) All steam output rating from 0 Psi at 212 °F. Fuel consumption based on light oil 20,160 Btu/LB(11200 Kcal/kg), heavy oil 19,728 Btu/LB(10960Kcal/ Kg), Natural gas 1,000 Btu / ft³ (8900Kcal/ m³).
 2) Specifications and dimensions are for your reference only. The Fulton Company reserves the right to change specifications and/or dimensions. Please refer to the factory's most current drawings.
 3) Consult factory for the dimension and connection of 4- pass design

