



A professional engineer, designer and manufacturer of  
boilers and pressure vessels with over 30 years of experience  
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high efficiency  
**fire tube boiler**



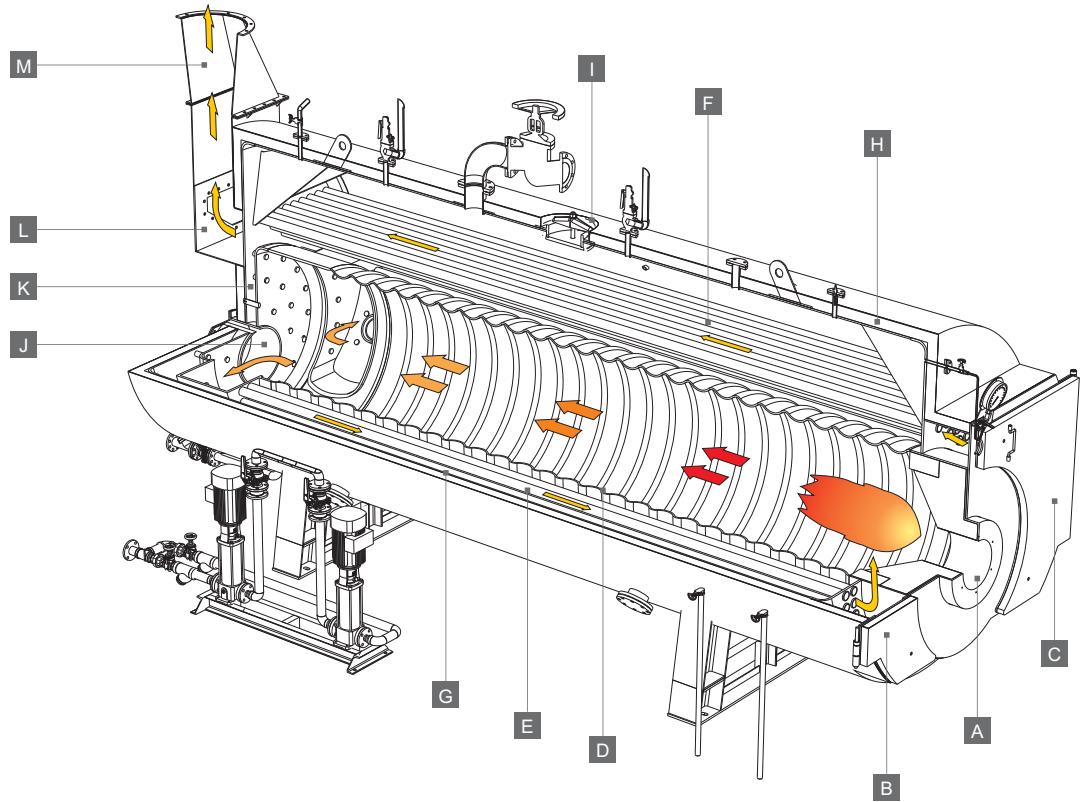
# fire tube boiler

Oil & gas fired types

- HEF type three-pass fire tube boilers assure continuous operation at 1:5 of turn down ratio and still maintain boiler efficiency as high as 88~90%. Besides it is possible to increase efficiency to more than 92% by adding heat recovery equipment.
- HEF type boilers have sufficient heating surface and wet-back design ensuring high durability.
- Advanced combustion system with wide variety of fuel, such as heavy oil, diesel oil, gas and waste liquid improves efficiency greatly and easy maintenance and operation.
- Multi boiler water level control devices ensure safety operation for the boilers.
- Start-up time is short. It takes about 15 minutes from cold ignition to generating steam.
- Simple and durable construction and combustion system allow users to easily handle the operation and maintenance.

With over 30 years of experience and precise engineering and strict quality control system, Taijune Boiler has created world-class boilers, pressure vessels and energy-saving equipment and built its' reputation in high product efficiency, high safety and stability trusted by users from wide variety of industries.

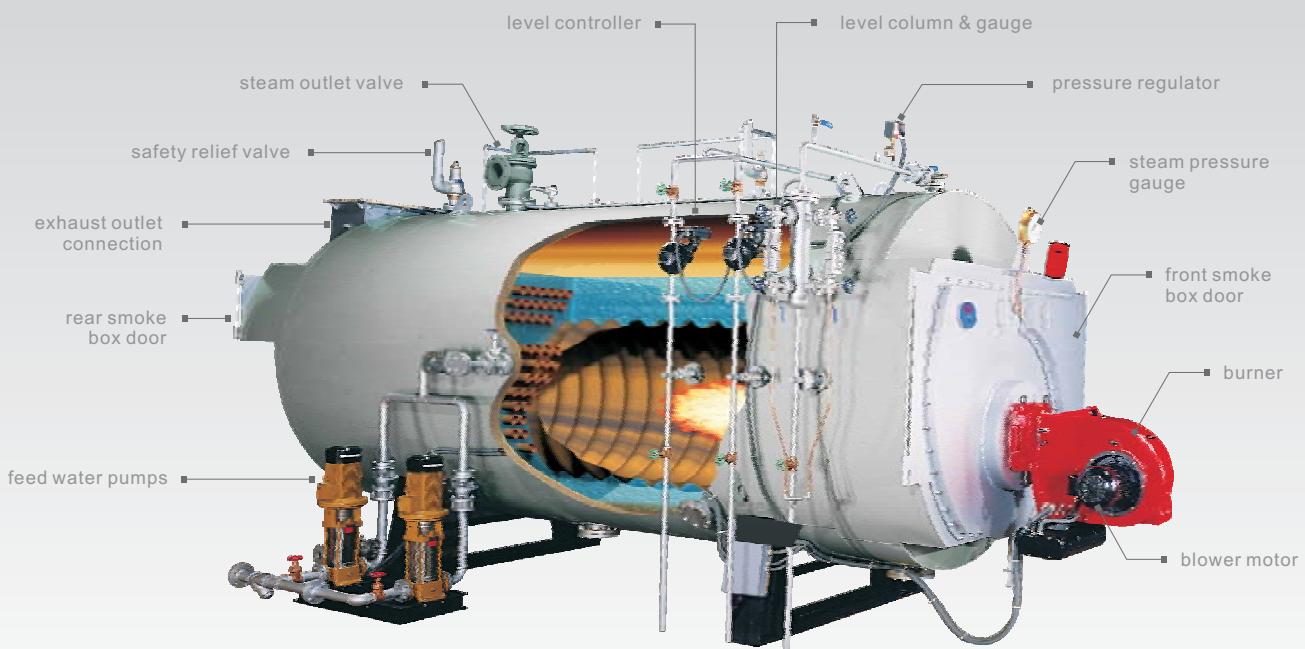




cut-away view of 3-pass fire tube boiler  
and the diagram of gas flow

## DESCRIPTION

- |          |                              |          |                            |
|----------|------------------------------|----------|----------------------------|
| <b>A</b> | burner port                  | <b>H</b> | hot insulation             |
| <b>B</b> | left front smoke box         | <b>I</b> | steam drum manhole         |
| <b>C</b> | right front smoke box        | <b>J</b> | combustion chamber manhole |
| <b>D</b> | corrugated furnace(1st pass) | <b>K</b> | wet-back furnace end       |
| <b>E</b> | 2nd pass smoke tubes         | <b>L</b> | rear smoke box             |
| <b>F</b> | 2nd pass smoke tubes         | <b>M</b> | exhaust outlet connection  |
| <b>G</b> | boiler shell                 |          |                            |

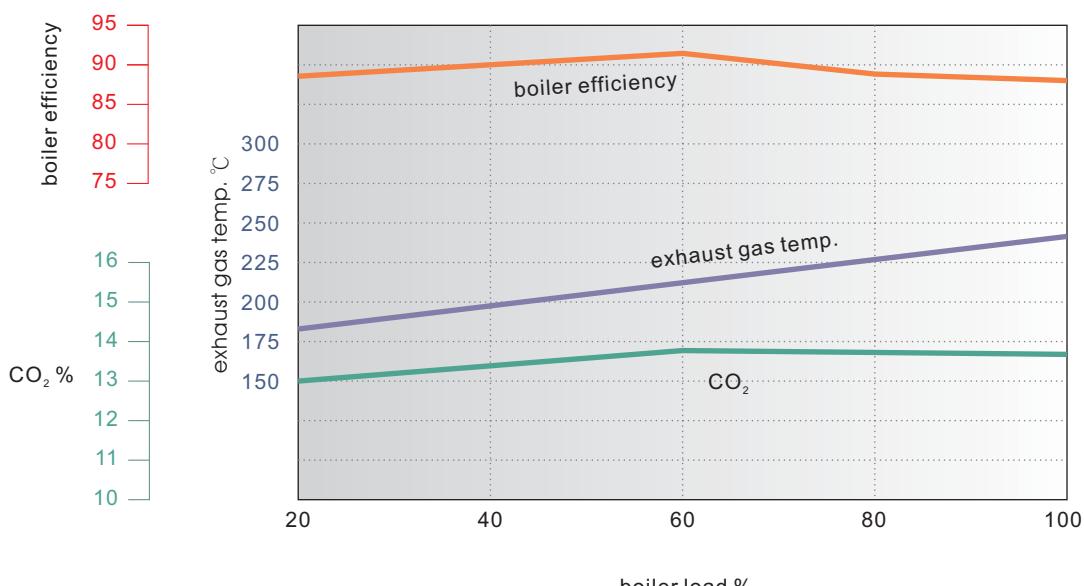


## specification table

MODEL NO. HEF -		1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715
EQUIV. EVAPORATION	Kg/hr	1200	1800	2400	3000	3600	4200	4800	5400	6000	7200	8400	9600	10800	12000	15000
HEAT OUTPUT	1000 kcal/hr	647	970	1293	1616	1940	2263	2586	2910	3233	3879	4526	5172	5819	6469	8086
HEAVY OIL CONSUMPTION	Kg/hr	74.9	112.4	149.8	187.3	224.8	262.2	299.7	337.1	374.6	449.5	524.5	599.4	674.3	749.2	936.5
DIESEL OIL CONSUMPTION	Kg/hr	70.6	105.8	141.1	176.4	211.7	247.0	282.2	317.5	352.8	423.3	493.9	564.5	635.0	705.6	882.0
LNG CONSUMPTION	M <sup>3</sup> /hr	85.5	128.2	171.0	213.7	256.5	299.2	342.0	384.7	427.5	513.0	598.5	684.0	769.5	855.0	1068.7
LPG CONSUMPTION	Kg/hr	61.6	92.4	123.2	154.0	184.8	215.6	246.4	277.1	307.9	369.5	431.1	492.7	554.3	615.9	769.9
STEAM OUTLET SIZE	mm $\frac{3}{4}$	50	75	75	100	100	125	125	125	150	150	150	200	200	200	200
SAFETY VALVE SIZE	mm $\frac{3}{4}$	25	32	40	25+32	25+32	25+40	32+40	40+40	40+40	40+50	50+50	50+50	50x2+25	50x2+32	50 x 3
FEED WATER INLET SIZE	mm $\frac{3}{4}$	32	32	40	40	40	40	50	50	50	50	50	50	50	50	50
BLOWDOWN SIZE	mm $\frac{3}{4}$	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
CHIMNEY SIZE	mm $\frac{3}{4}$	350	400	500	500	580	580	700	700	750	750	850	850	950	950	1000
BOILER SHELL DIAMETER	mm $\frac{3}{4}$	1500	1560	1800	1950	1950	1950	2130	2130	2260	2360	2460	2550	2700	2750	2880
BOILER LENGTH	mm	3755	4030	4350	5055	5375	5765	5660	5980	6895	6545	6690	7020	7475	8055	8835
WEIGHT - FULL WATER	Kg	3100	3600	5100	5600	6800	7700	8900	9600	10300	12000	13600	15200	15600	18300	19700
NORMAL WATER VOLUME	Kg	2300	2900	4300	4900	5600	6300	7500	8200	8600	9300	10700	11700	12700	14200	16200
APPROX. BOILER WEIGHT - EMPTY	Kg	6000	6900	8000	8800	11000	11800	12800	13600	15000	16800	19500	20000	22000	28000	29000

Remarks: 1. The above data is based on 1.0MPa boiler design pressure.  
 2. The above data may be changed without notifications.  
 3. Hot water boilers are available upon requests.

### boiler performance curve



saturation table - pressure increment

pressure MPa ABS.	sat. temp. °C	enthalpy of sat. water kcal/kg	heat of evaporation kcal/kg	enthalpy of sat. steam kcal/kg	steam density kg/m <sup>3</sup>	Sp. Volume of steam m <sup>3</sup> /kg
0.10	99.6	99.79	539.57	639.37	0.5902	1.6943
0.15	111.4	111.66	532.06	643.72	0.8624	1.1595
0.20	120.2	120.66	526.22	646.87	1.1289	0.8859
0.25	127.4	127.99	521.35	649.33	1.3912	0.7188
0.30	133.6	134.23	517.12	651.35	1.6505	0.6059
0.35	138.9	139.70	513.35	653.05	1.9074	0.5243
0.40	143.6	144.58	509.93	654.51	2.1624	0.4625
0.45	147.9	149.00	506.79	655.79	2.4157	0.4140
0.50	151.9	153.06	503.87	656.93	2.6677	0.3749
0.55	155.5	156.81	501.13	657.94	2.9185	0.3426
0.60	158.9	160.31	498.55	658.86	3.1683	0.3156
0.65	162.0	163.59	496.10	659.69	3.4173	0.2926
0.70	165.0	166.68	493.77	660.44	3.6656	0.2728
0.75	167.8	169.60	491.53	661.14	3.9132	0.2555
0.80	170.4	172.38	489.39	661.77	4.1603	0.2404
0.85	173.0	175.03	487.33	662.36	4.4069	0.2269
0.90	175.4	177.57	485.34	662.91	4.6531	0.2149
0.95	177.7	180.00	483.41	663.41	4.8989	0.2041
1.00	179.9	182.34	481.54	663.88	5.1445	0.1944
1.05	182.0	184.59	479.73	664.32	5.3898	0.1855
1.10	184.1	186.76	477.97	664.73	5.6349	0.1775
1.15	186.1	188.86	476.25	665.11	5.8798	0.1701
1.20	188.0	190.89	474.57	665.46	6.1246	0.1633
1.25	189.8	192.86	472.94	665.80	6.3692	0.1570
1.30	191.6	194.78	471.33	666.11	6.6138	0.1512
1.35	193.4	196.64	469.77	666.40	6.8583	0.1458
1.40	195.1	198.45	468.23	666.68	7.1028	0.1408
1.45	196.7	200.21	466.73	666.94	7.3473	0.1361
1.50	198.3	201.93	465.25	667.18	7.5918	0.1317
1.55	199.9	203.61	463.80	667.41	7.8364	0.1276
1.60	201.4	205.25	462.37	667.62	8.0809	0.1237
1.65	202.9	206.85	460.97	667.82	8.3256	0.1201
1.70	204.3	208.42	459.59	668.01	8.5703	0.1167
1.75	205.8	209.95	458.23	668.18	8.8152	0.1134
1.80	207.2	211.45	456.89	668.34	9.0601	0.1104
1.85	208.5	212.93	455.57	668.50	9.3052	0.1075
1.90	209.8	214.37	454.27	668.64	9.5504	0.1047
1.95	211.1	215.79	452.99	668.78	9.7958	0.1021
2.00	212.4	217.18	451.72	668.90	10.0413	0.0996
2.10	214.9	219.90	449.23	669.13	10.5329	0.0949
2.20	217.3	222.52	446.80	669.32	11.0253	0.0907
2.30	219.6	225.06	444.42	669.48	11.5186	0.0868
2.40	221.8	227.53	442.10	669.62	12.0128	0.0832
2.50	224.0	229.92	439.81	669.74	12.5080	0.0799

fuel properties

Fuel Type	Lower Heating Value	Sp. Gravity
Natural Gas	8,900 kcal/m <sup>3</sup>	
L.P.G.	11,800 kcal/kg	558 kg/m <sup>3</sup>
Diesel Oil	10,300 kcal/kg	790 kg/m <sup>3</sup>
Boiler Oil	9,850 kcal/kg	900 kg/m <sup>3</sup>
Heavy Oil	9,700 kcal/kg	960 kg/m <sup>3</sup>

Remarks: Fuel properties may vary by geographical locations and countries.

## reference flow diagram

Remarks:  
The fuel flow in this diagram is for pressure atomizing heavy oil fired burners.

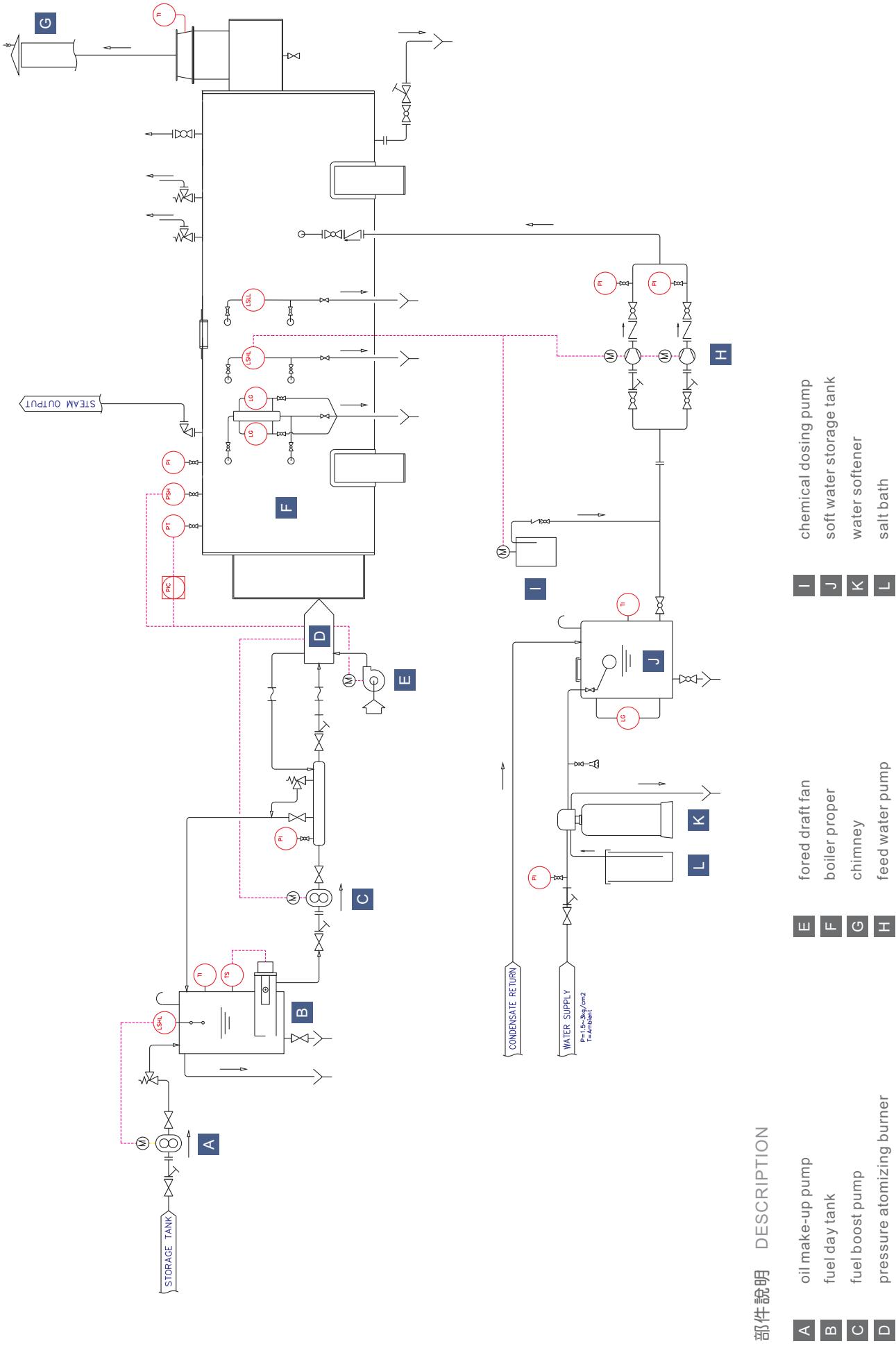
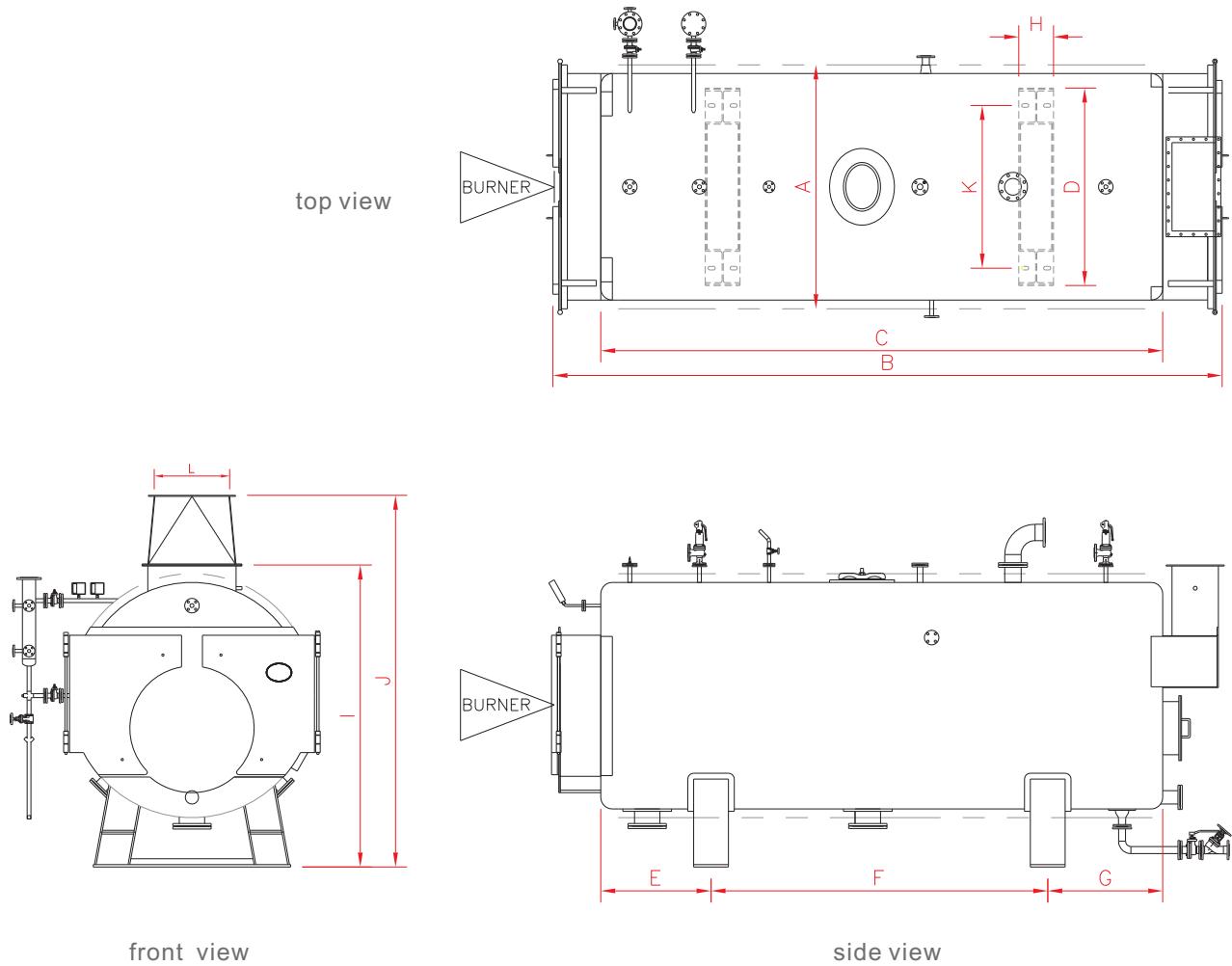


figure and dimension table



TYPE \ DIM	A	B	C	D	E	F	G	H	I	J	K	§ L
1701	1650	3755	3050	1400	530	1860	660	200	2120	2820	1200	350
1702	1710	4030	3360	1400	610	1900	850	200	2290	2795	1200	400
1703	1950	4350	3540	1550	590	2200	750	200	2450	2950	1330	500
1704	2100	5055	4420	1700	660	2770	780	200	2600	3100	1480	500
1705	2100	5375	4500	1700	800	2890	800	250	2600	3200	1400	580
1706	2100	5765	4840	1700	950	2900	990	300	2600	3200	1400	580
1707	2282	5660	4850	1930	700	3130	760	250	2960	3660	1660	700
1708	2282	5980	5160	1930	740	3400	750	250	3060	3760	1660	700
1709	2410	6895	5940	1900	1200	3540	1200	250	2920	3570	1600	750
1710	2510	6545	5520	2000	980	3450	1080	250	3290	3990	1700	750
1711	2620	6690	4840	1970	930	3780	1030	300	3120	3820	1700	850
1712	2700	7020	5950	2220	1060	3730	1160	300	3200	3900	1900	850
1713	2860	7475	6350	2400	1045	4160	1145	300	3480	4180	2100	950
1714	2894	8055	6800	2400	1250	4300	1250	300	3675	4375	2100	950
1715	3030	8835	7580	2450	1250	4880	1450	300	3545	4245	2100	1000

high efficiency fire tube boiler



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