



ELECTRIC BOILERS

ELECTRODE BOILERS

WITH JET-FLO® TECHNOLOGY



a degree above | www.thermon.com | www.vaporpower.com

VAPOR POWER INTERNATIONAL

ELECTRODE BOILERS

Electrode Steam Boilers

Imperial:
Steam from: 800KW – 50,000KW
(2,700 pph – 167,000 pph)
Operating pressure from 100 – 405 psi
Voltages from: 4.16kV – 15kV

Metric:
Steam from: 800KW – 50,000KW
(1,225 kg/hr – 75,771 kg/hr)
Operating pressure from: 6.9 – 27.9 bar
Voltages from: 4.16 kV – 15 kV

Hot Water Boilers with similar capacities are also available

The Electrode Steam Boiler with Jet-Flo® technology consists of an insulated pressure vessel and is fully enclosed in 18 gauge enameled steel panels. There is no heat transfer through tube walls and there will never be tube failures from excessive wall temperature, poor water treatment, or fireside corrosion, since there are no tubes to fail! Heat transfer takes place directly in the water in the steam chamber, thus producing high quality steam of 99.95% purity throughout the operating range.

A Vapor Power electrode steam boiler offers a great hybrid boiler room solution, taking advantage of off peak power rates. Fossil fuel fired boilers and the electrode boiler are automatically rotated based on real time power costs, maximizing steam plant efficiency.

For **Imperial** use the following: Electrode steam boilers are available in sizes from 800KW to 50,000KW, 2,700 PPH to 167,000 PPH, supply voltages of 4,160 to 15,000 volts.

For **Metric** use the following: Electrode steam boilers are available in sizes from 800KW to 50,000KW, 1,225 kg/hr to 75,771 kg/hr, supply voltages of 4,160 to 15,000 volts.

And offer efficiencies greater than 99%.

ADVANTAGES

- **HIGH EFFICIENCY**
Greater than 99%
- **HIGH TURNDOWN & QUICK RESPONSE TO LOAD CHANGES**
Safely operate as low as 1% of output
- **RELIABLE SOURCE OF STEAM**
For areas affected by oil and/or gas shortages, or where coal is either low grade or not available
- **NO MOVING PARTS**
Eliminates downtime due to packing leaks around the hydraulically-operated shield positioning system that is present on other designs. No risk of failure of internal mechanical shields. No hydraulic system required.
- **LOW INSTALLATION COST**
Eliminates need for special boiler room, fuel handling and storage equipment, air handling equipment, preheaters and/or economizers, stacks, flues and emission control equipment, ash handling and disposal facilities, combustion safety systems, noise abatement equipment, plus space and installation costs associated with aforementioned equipment.
- **NO EMISSIONS**
Makes for an easy installation because no air permits are required
- **LABOR SAVINGS**
Electric boilers in most states are classified as “unfired steam generators” and as such do not require full operator attendance
- **NO DIELECTRIC BARRIERS NEEDED**
- **NO SPECIAL WATER TREATMENT**
- **INDUSTRIAL GRADE COMPONENTS**

APPLICATIONS

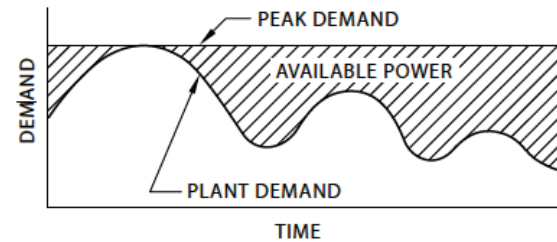
- Brewery & Distillation
- Container & Paper Processing
- Healthcare Facilities
- Power Plant
- Process Steam & Heat
- University & Institutional Facilities

ELECTRODE BOILERS

The Vapor Power electrode boiler creates operating advantages from its unique design which results in a high efficiency, high quality steam boiler. Using electricity as a clean, efficient and easily controlled fuel, all the energy input to the boiler is converted to steam with 99% efficiency. Vapor Power's electrode boiler output is controllable from 0-100%, with neither the limited turndown ratios nor the increasing inefficiency at low output conditions characteristic of fossil-fired boilers. There are no stacks to purchase and there are zero pollutant emissions.

The simplicity of electrode controls and engineered boiler design results in significantly reduced maintenance. With no moving parts within the boiler, there is less maintenance associated with our units. Even under the conditions of feedwater loss, for example, the electrode boiler is fail-safe as low water in itself affects boiler shutdown, precluding catastrophic failure. There is no heat transfer through tube walls and there will never be tube failures from excessive wall temperature, poor water treatment, or fireside corrosion, since there are no tubes to fail. Heat transfer takes place directly in the water in the steam chamber, thus producing high quality steam of 99.95% purity throughout the operating range.

AVAILABLE POWER: With the electric boiler set at a slightly higher pressure than parallel fossil fueled boilers, sensing plant demand, and limited to a maximum plant demand set point, competitively priced available power can be consumed to effect a flat demand curve.



By using a 2-element control system, the electric boiler would either generate as much steam as allowed by the demand control system or, when steam demand is below what the electric boiler is allowed to generate, be limited by the steam pressure control to a preset steam pressure.

Using electricity as a clean, efficient and easily controlled fuel, all the energy input to the boiler is converted to steam with 99% efficiency

CONTROLS

The electrode boiler is locally managed by a PLC-based system that controls every aspect of the boiler which includes control of water level, steam pressure and KW limit. All safety devices will also be monitored by the PLC. Interface to the PLC by an operator is accomplished through an HMI device that communicates directly with the boiler PLC. Remote data acquisition and control is available via ModBus, Ethernet, Bacnet, or other communication protocol.

BUILT TO MEET STANDARDS

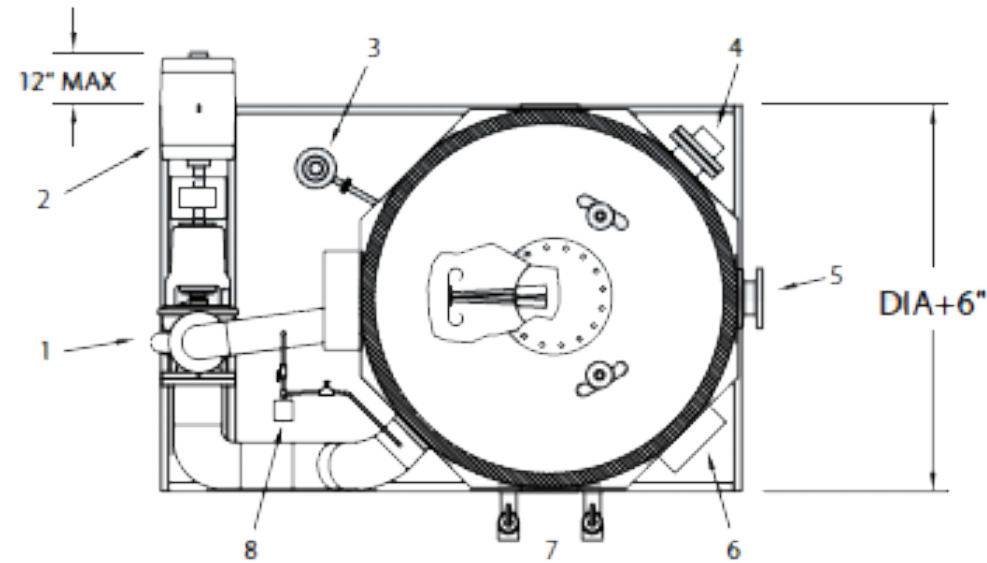
Every unit is built to ASME Standards, Hartford inspected and National Board registered. Other approvals are also available upon request.

HOT WATER OPTION

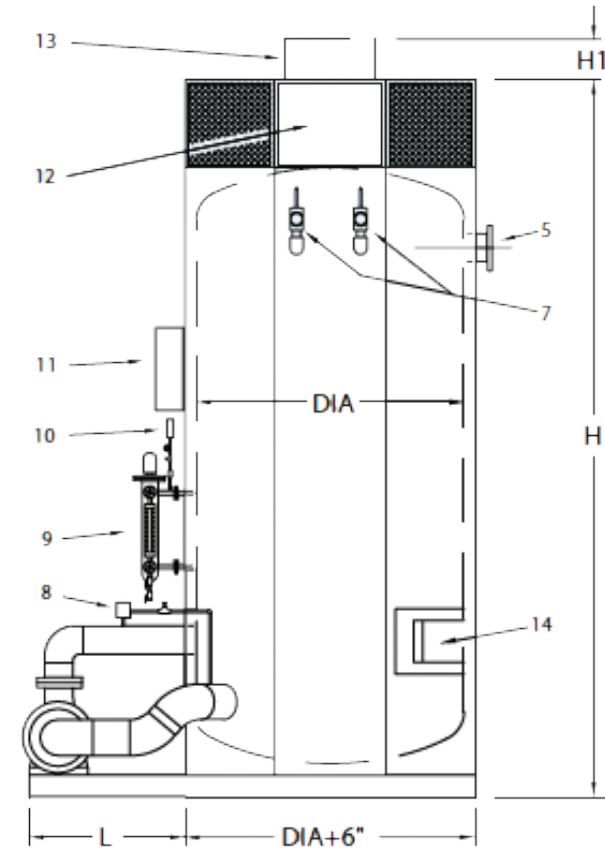
To generate hot water, Vapor Power offers a steam-to-water heat exchanger attached directly to the boiler. Outputs available range up to 170,000 MBTU/Hr. The advantage of this system is that the condensate from the heat exchanger flows by gravity back to the boiler eliminating the need for a condensate return or deaerator system, which also improves the system efficiency.



EXTERNAL PUMP BOILERS



- 1. Circulation Pump
- 2. Pump Motor w/ VFD
- 3. Water Column
- 4. Standby Heater
- 5. Steam Outlet
- 6. Manhole
- 7. Safety Valves (2)



- 8. Conductivity Cell
- 9. Sight Gauge
- 10. Pressure Controls & Gauge
- 11. I/O Junction Box
- 12. High Voltage Entrance
- 13. Header Removal Clearance
- 14. Manway

MODEL NUMBERS, RATINGS & DIMENSIONS - EXTERNAL PUMP BOILERS - Imperial

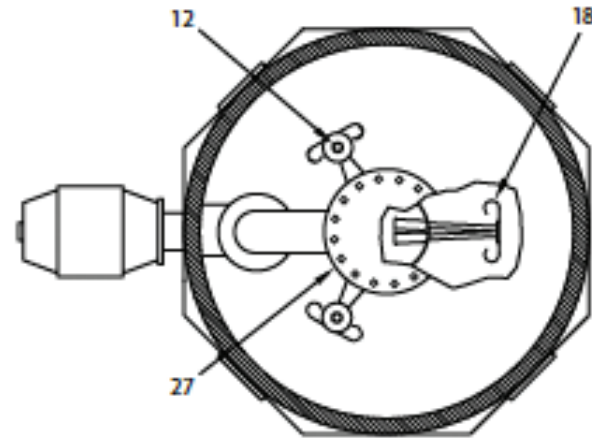
Model Number	Nominal Rating*** (KW)			Nominal Rating*** (PPH)			Number of Electrodes	Dimensions (inches) @ 13.2KV				Weight (Lbs)****	
	4160V	6.9KV	13.2KV	4160V	6.9KV	13.2KV		Dia	H	H1	L	Ship	Operate
BBJ-300	800	1680	3000	2700	5600	10000	3	60	166	6	30	10000	13800
BBJ-420	1200	2400	4200	4000	8000	14000	3	60	176	14	30	10500	14900
BBJ-600	1700	3400	6000	5700	11300	20000	3	60	186	24	30	11000	15600
BBJ-680	1900	3800	6800	6300	12700	22600	3	60	196	29	36	11800	16400
BBJ-770	2300	4600	8200	7700	15300	27300	3	60	206	36	36	13000	17800

MODEL NUMBERS, RATINGS & DIMENSIONS - EXTERNAL PUMP BOILERS - Metric

Model Number	Nominal Rating*** (KW)			Nominal Rating*** (Kg/Hr)			Number of Electrodes	Dimensions (mm) @ 13.2KV				Weight (Kg)****	
	4160V	6.9KV	13.2KV	4160V	6.9KV	13.2KV		Dia	H	H1	L	Ship	Operate
BBJ-300	800	1680	3000	1225	2541	4537	3	1524	4216	152	762	4537	6261
BBJ-420	1200	2400	4200	1815	3630	6352	3	1524	4470	356	762	4764	6760
BBJ-600	1700	3400	6000	2586	5127	9074	3	1524	4724	610	762	4991	7078
BBJ-680	1900	3800	6800	2858	5762	10254	3	1524	4978	737	914	5354	7441
BBJ-770	2300	4600	8200	3494	6942	12387	3	1524	5232	914	914	5898	8076

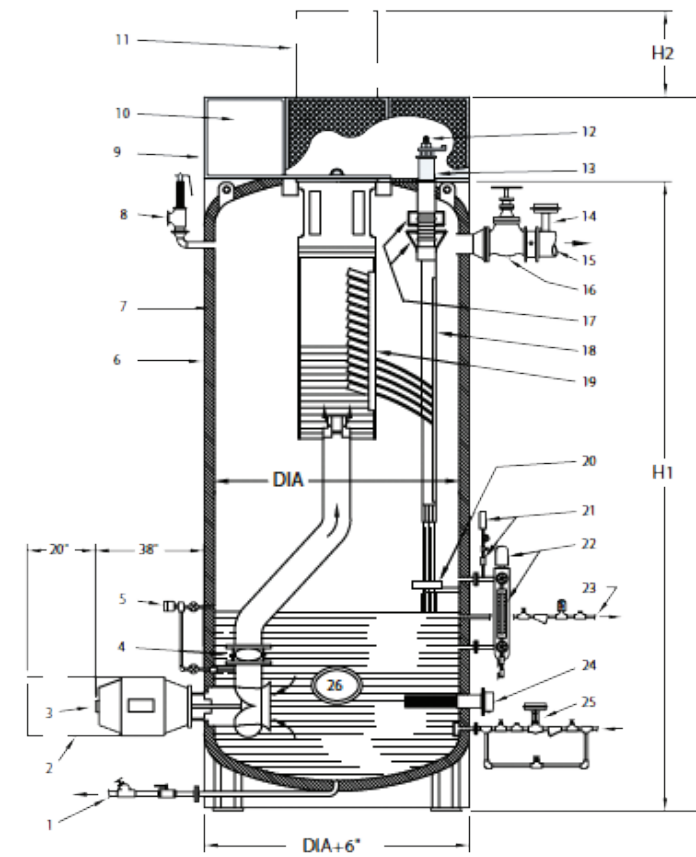
* All of these models utilize external ANSI standard circulation pumps
 *** Ratings are for operation at 150 psi with 220 Degrees Fahrenheit Feedwater
 **** Weights are for 175psi design pressure

INTERNAL PUMP BOILERS



PARTIAL TOP VIEW

1. Blowdown Valves
2. Pump Removal Clearance
3. Circulation Pump w/ VFD
4. Check Valve (for 2-pump boilers only)
4. Conductivity Cell
6. Sheet Metal Lagging
7. Insulation
8. Safety Valves (2)
9. Electrode Terminal Enclosure
10. Conduit Entrance Panel
11. Header Removal Clearance
12. Conductor Rod
13. High Voltage Insulators
14. Back Pressure Regulator
15. Steam Outlet
16. Non-Return Valve
17. Insulator Shields
18. Electrode / Strike Plate
19. Nozzle Header
20. Counter Electrode
21. Pressure Manifold & Pressure Gauge
22. Water Column & Sight Gauge
23. Surface Blowoff
24. Standby Heater
25. Feedwater Regulator
26. Manhole
27. Top Cover



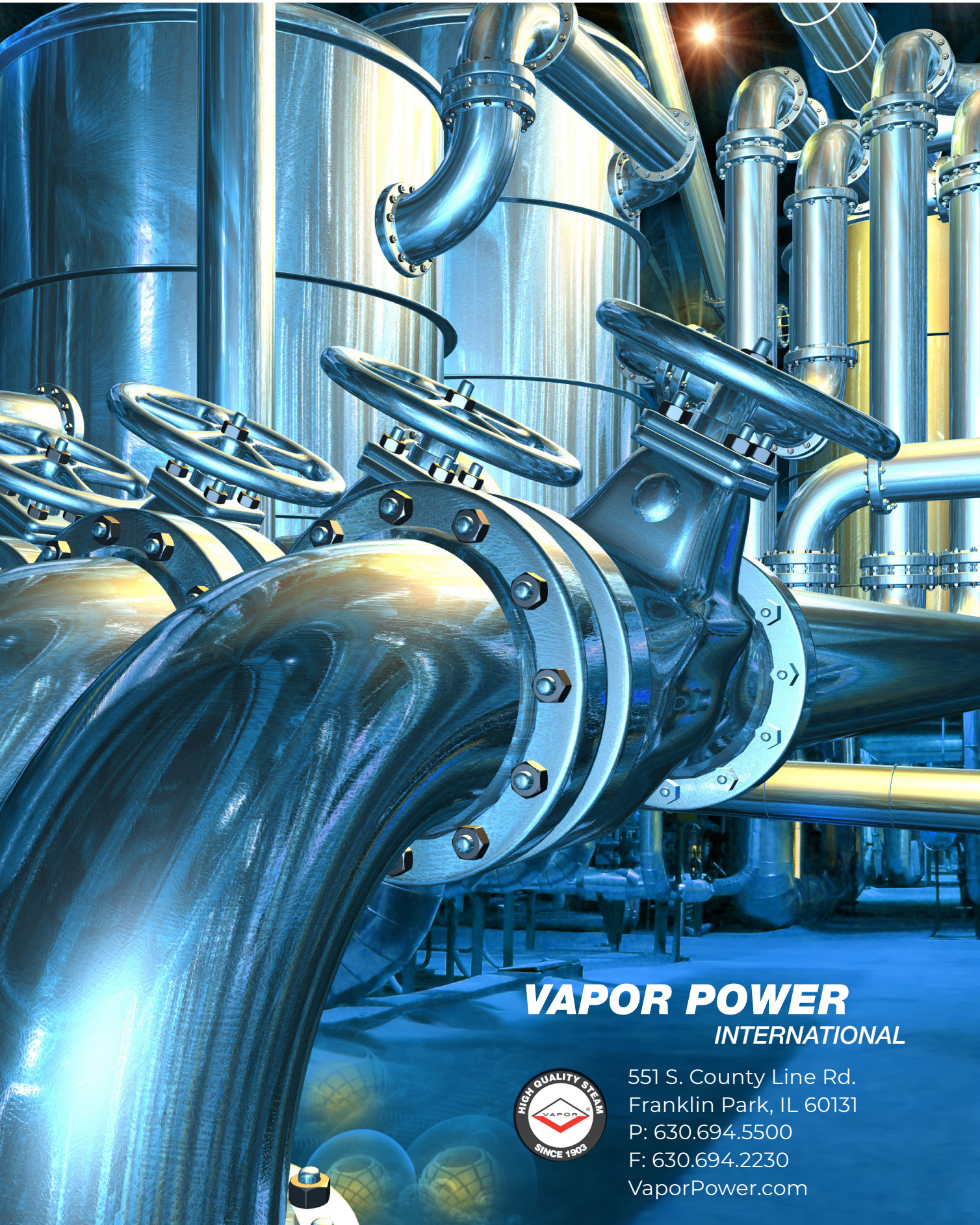
MODEL NUMBERS, RATINGS & DIMENSIONS - INTERNAL PUMP BOILERS - Imperial

Model Number	Nominal Rating** (KW)			Nominal Rating** (PPH)			Number of Electrodes	Dimensions (inches) @ 13.2KV				Weight (Lbs)***	
	4160V	6.9KV	13.2KV	4160V	6.9KV	13.2KV		Dia	H	H1	H2	Ship	Operate
BBJ-1200	3400	6700	12000	11300	22300	40000	6	72	221	197	24	16000	23200
BBJ-1360	3800	7600	13600	12700	25300	45300	6	72	231	207	28	16800	24500
BBJ-1640	4600	9200	16400	15300	30600	54600	6	72	246	222	36	18000	27100
BBJ-1800	5100	10100	18000	17000	33600	60000	9	84	233	207	22	23000	38000
BBJ-2000	5700	11200	20000	19000	37300	67000	9	84	243	217	27	24000	39500
BBJ-2500	7100	7100	25000	23600	46600	83000	9	84	243	217	32	27000	40000
BBJ-2400	6800	14000	24000	22600	44600	80000	12	96	231	205	38	30000	47000
BBJ-2700	7600	13400	27000	25300	50300	90000	12	96	242	216	43	31000	49000
BBJ-3300	9300	15100	33000	31000	61600	110000	12	102	262	236	51	34000	57000
BBJ-4200	11900	23500	42000	39600	78300	140000	15	108	267	241	51	42000	70000
BBJ-5000	14200	28000	50000	47300	93200	167000	18	120	267	241	51	52000	82000

MODEL NUMBERS, RATINGS & DIMENSIONS - INTERNAL PUMP BOILERS - Metric

Model Number	Nominal Rating** (KW)			Nominal Rating** (Kg/Hr)			Number of Electrodes	Dimensions (mm) @ 13.2KV				Weight (Kg)***	
	4160V	6.9KV	13.2KV	4160V	6.9KV	13.2KV		Dia	H	H1	H2	Ship	Operate
BBJ-1200	3400	6700	12000	5127	10118	18149	6	1829	5613	5004	610	7260	10526
BBJ-1360	3800	7600	13600	5762	11479	20554	6	1829	5867	5258	711	7623	11116
BBJ-1640	4600	9200	16400	6942	13884	24773	6	1829	6248	5639	914	8167	12296
BBJ-1800	5100	10100	18000	7713	15245	27223	9	2134	5918	5258	559	10436	17241
BBJ-2000	5700	11200	20000	8621	16924	30399	9	2134	6172	5512	686	10889	17922
BBJ-2500	7100	7100	25000	10708	21143	37659	9	2134	6172	5512	813	12250	18149
BBJ-2400	6800	14000	24000	10254	20236	36298	12	2438	5867	5207	965	13612	21325
BBJ-2700	7600	13400	27000	11479	22822	40835	12	2438	6147	5486	1092	14065	22232
BBJ-3300	9300	15100	33000	14065	27949	49909	12	2591	6655	5994	1295	15426	25862
BBJ-4200	11900	23500	42000	17967	35526	63521	15	2743	6782	6121	1295	19056	31760
BBJ-5000	14200	28000	50000	21461	42287	75771	18	3048	6782	6121	1295	23593	37205

** Ratings are for operation at 150 psi with 220 Degrees Farenheight Feedwater
 *** Weights are for 175psi design pressure



VAPOR POWER

INTERNATIONAL



551 S. County Line Rd.
Franklin Park, IL 60131
P: 630.694.5500
F: 630.694.2230
VaporPower.com