ELECTRODE BOILERS

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. Electrode steam boilers are available in sizes from 3,000 to 34,000KW, 10,000 to 113,000 PPH, supply voltage of 4,160 to 14,400 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 Steam Boilers
Steam from: 3000 kW to 34,000 kW (10,000 to 113,000 PPH)
Pressure from: 100 – 500 PSIG
Voltages from: 4160 – 14,400 Volts

Hot Water Boilers with similar capacities are also available
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.
1. Blowdown Valves
2. Pump Removal Clearance
3. Circulation Pump w/ VFD
4. Check Valve (for 2-pump boilers only)
5. 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

* All of these models utilize external ANSI standard circulation pumps
** Low headroom application, at a premium price - two circ. pumps provided side by side
*** Ratings are for operation at 150 psi with 220 Degrees Fahrenheit Feedwater
**** Weights are for 175psi design pressure

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<th>Model Number</th>
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<th>Nominal Rating** (PPH)</th>
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