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Interesting Facts



- The Metrodome is the only facility in the country to host a Super Bowl, a World Series and a NCAA Final Four Basketball Championship.
- Due to little precipitation, Antarctica is technically the largest desert in the world.
- The original 3 Musketeers candy bar had 3 pieces. Each a different flavor: vanilla, chocolate & strawberry.

June Dates to Remember

- June 6 - ASHRAE Golf Outing
- June 14 - DPS Golf Outing
- June 17 - Father's Day
- June 28 - Minnesota Blue Flame Golf Outing



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FEATURED Product



Fulton Pulse Steam Boiler

Same great features as the Pulse Hydronic Boiler, but in a Steam Version.

- No Power Burner
- No Moving Parts
- Sealed Combustion
- Only 35" Wide
- High & Low Pressure Available
- Models : 500 & 750 MBH Input (Nat Gas)
650 MBH Input (Propane)
- Vertical Model available in 750 & 1150 MBH Input (Nat Gas & Low Press Only)



Boiler Feed Sizing

The key to sizing boiler feed units is the steam evaporation rate which is .069 GPM per boiler horsepower (BHP). One BHP equals 34.5 lbs per hour of water evaporated at sea level. Therefore,

$$\text{Evaporation rate for 1 BHP} = (34.5 \text{ lbs}/60 \text{ min}) \times (1 \text{ gal}/8.34 \text{ lbs}) = .069 \text{ GPM}$$

Receiver Sizing

Receivers are sized for 10-20 minutes of gross storage. We use 15 minutes as a rule of thumb. Therefore,

$$\text{Receiver Size (Gal)} = \text{BHP} \times .069 \times 15$$

Pump Sizing

Pump Flow Rates are sized for 150 to 200% of the maximum steaming rate to help balance boiler conditions and to reduce thermal shock. We typically use 200% for on/off pump operation. Therefore,

$$\text{Flow Rate (GPM)} = \text{BHP} \times .069 \times 2$$

The boiler feed pump discharge pressure should be equal to the maximum boiler operating pressure, plus the increase in elevation, plus the friction loss of pipe, fittings and valves, plus a safety margin (usually 5-10 PSI).

Example: 500 HP Boiler operating at 15PSI, located 12ft above unit, pipe friction loss of 18ft, & feed valve with a 5 PSI differential loss.

$$\text{Receiver Size} = 500 \times .069 \times 15 = 518 \text{ Gal}$$

$$\text{Flow Rate} = 500 \times .069 \times 2 = 69 \text{ GPM}$$

$$\text{Discharge Pressure} = 15 \text{ PSI} + ((12 \text{ ft} + 18 \text{ ft}) / 2.31) + 5 \text{ PSI} + 5 \text{ PSI} = 38 \text{ PSI}$$

[\(Click here for Shipco's Boiler Feed Sizing Math Wizard\)](#)



Low Water Temperature Boiler Applications

Reducing boiler return water temperature can increase boiler efficiency, but care needs to be taken in the design of the system, so that cold return water temperature will not harm the boiler. Standard and mid-efficiency boilers (up to 88% efficient) have a minimum return water temperature of 140 degrees F. However, low water temperature applications may require minimum water temperatures of as low as 80 degrees F.

Common low water temperature applications are:

- Pool heaters
- Radiant floor heat
- Snow melt
- Heat pump systems



Generally, any boiler can be used for these applications, but bypass valves, bypass pumps or a secondary heat exchanger will be needed to insure that the return water temperature never goes below 140 degrees F. (Return water temperatures below 140 degrees F will cause condensation in the boiler which will cause premature failure of the heat exchanger)

The easiest solution for low water temperature applications is to use a condensing type boiler. Condensing boilers have no minimum return water temperatures, and some condensing boilers, like the Fulton Pulse and Vantage boilers do not have a minimum water flow rate.

Featured Job - Minneapolis Community Technical College (MCTC)

Engineer: Nelson-Rudie & Associates
 Mechanical Contractor: Albers Mechanical
 Startup & Commissioning done by Brian Hauck & Chris Kubitschek
 Installed: Fall 2006
 Equipment:



- (2) Fulton Vantage VTG3000 Gas Fired Water Boilers
 - High Efficiency Condensing Type
 - Siemens LMV Linkageless Fuel/Air Ratio Controller
- (2) Burnham 3PW600 High Pressure Water Boilers
 - Gordon Piatt F18.1 Air Atomizing Gas/Oil Burners
 - Siemens LMV Linkageless Fuel/Air Ratio Controller
- (1) Boiler Wizard Boiler Management Controller
- (1) Gordon Piatt ID2D-525 Fuel Oil Transfer Pump System
- (2) Cain Boiler Economizers RTR148D26ALS
- Schebler Model P1 Exhaust Stack Systems

