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## 200 HP FIRETUBE BOILER

Maximum BTU/hr Input (ie: Rated Input @ High Fire / 100% Input Rating)	$200 \times 42,000 = 8,400,000$ BTU
Cubic Feet of Natural Gas Required	$8,400,000 \div 1,000 = 8,400$ Cu Ft
Cubic Feet of Vaporized Propane Required	$8,400,000 \div 2,500 = 3,360$ Cu Ft
Gallons of Liquid Propane Required	$8,400,000 \div 91,600 = 91.7$ Gallons
Gallons of #2 Diesel Oil Required	$8,400,000 \div 140,000 = 60$ Gallons
Minimum BTU/hr Input at a 4:1 Turndown Ratio (Low Fire)	$8,400,000 \div 4 = 2,100,000$ BTU
Cubic Feet of Natural Gas Required	$2,100,000 \div 1,000 = 2,100$ Cu Ft
Cubic Feet of Vaporized Propane Required	$2,100,000 \div 2,500 = 840$ Cu Ft
Gallons of Liquid Propane Required	$2,100,000 \div 91,600 = 22.92$ Gallons
Gallons of #2 Diesel Oil Required	$2,100,000 \div 140,000 = 15$ Gallons
Maximum Steam Production in lbs/hr (High Fire)	$200 \times 34.5 = 6,900$ lbs/hr
Maximum Water Evaporation Rate	$200 \times .069 = 13.8$ GPM
Minimum Feedwater Pump Flow (on / off pump strategy)	$13.8 \times 2 = 27.6$ GPM
Minimum Feedwater Pump Flow (modulating pump strategy)	$13.8 \times 1.5 = 20.7$ GPM
Minimum Feedwater Tank Storage Requirement	138 Gallons
Steam Temperature at <u>85 psi</u> Saturated	337.5 °F
BTU/hr Output, Based on 80% Efficiency at High Fire	$8,400,000 \times .80 = 6,720,000$ BTU
BTU/hr Output, Based on 80% Efficiency at Low Fire	$2,100,000 \times .80 = 1,680,000$ BTU
Square Feet Heating Surface (sq. ft. HS) at 5 sq. ft. per HP	$200 \times 5 = 1,000$ Sq Ft
Minimum Steam Safety Relief Valve Capacity at Boiler Design	$6,900 \times 1.10 = 7,590$ lbs/hr
Minimum Water Softener Flow Capacity at High Fire (always based upon 100% input)	$10.35 \times 2 = 20.7$ GPM

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**Controls Division - Pacific Combustion Engineering - Washougal, WA (360) 335-1443**  
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