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300 HP FIRETUBE BOILER

Maximum BTU/hr Input (ie: Rated Input @ High Fire / 100% Input Rating)	$300 \times 42,000 = 12,600,000$ BTU
Cubic Feet of Natural Gas Required	$12,600,000 \div 1,000 = 12,600$ Cu Ft
Cubic Feet of Vaporized Propane Required	$12,600,000 \div 2,500 = 5,040$ Cu Ft
Gallons of Liquid Propane Required	$12,600,000 \div 91,600 = 138.46$ Gallons
Gallons of #2 Diesel Oil Required	$12,600,000 \div 140,000 = 90$ Gallons
Minimum BTU/hr Input at a 4:1 Turndown Ratio (Low Fire)	$12,600,000 \div 4 = 3,150,000$ BTU
Cubic Feet of Natural Gas Required	$3,150,000 \div 1,000 = 3,150$ Cu Ft
Cubic Feet of Vaporized Propane Required	$3,150,000 \div 2,500 = 1,260$ Cu Ft
Gallons of Liquid Propane Required	$3,150,000 \div 91,600 = 34.39$ Gallons
Gallons of #2 Diesel Oil Required	$3,150,000 \div 140,000 = 22.5$ Gallons
Maximum Steam Production in lbs/hr (High Fire)	$300 \times 34.5 = 10,350$ lbs/hr
Maximum Water Evaporation Rate	$300 \times .069 = 20.7$ GPM
Minimum Feedwater Pump Flow (on / off pump strategy)	$20.7 \times 2 = 41.4$ GPM
Minimum Feedwater Pump Flow (modulating pump strategy)	$20.7 \times 1.5 = 30.05$ GPM
Minimum Feedwater Tank Storage Requirement	207 Gallons
Steam Temperature at <u>150 psi Saturated</u>	366 °F
BTU/hr Output, Based on 80% Efficiency at High Fire	$12,600,000 \times .80 = 10,080,000$ BTU
BTU/hr Output, Based on 80% Efficiency at Low Fire	$3,150,000 \times .80 = 2,520,000$ BTU
Square Feet Heating Surface (sq. ft. HS) at 5 sq. ft. per HP	$300 \times 5 = 1,500$ Sq Ft
Minimum Steam Safety Relief Valve Capacity at Boiler Design	$10,350 \times 1.10 = 11,385$ lbs/hr
Minimum Water Softener Flow Capacity at High Fire (always based upon 100% input)	$20.7 \times 2 = 41.4$ GPM

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