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600 HP FIRETUBE BOILER

Maximum BTU/hr Input (ie: Rated Input @ High Fire / 100% Input Rating)	$600 \times 42,000 = 25,200,000 \text{ BTU}$
Cubic Feet of Natural Gas Required	$25,200,000 \div 1,000 = 25,200 \text{ Cu Ft}$
Cubic Feet of Vaporized Propane Required	$25,200,000 \div 2,500 = 10,080 \text{ Cu Ft}$
Gallons of Liquid Propane Required	$25,200,000 \div 91,600 = 275.10 \text{ Gallons}$
Gallons of #2 Diesel Oil Required	$25,200,000 \div 140,000 = 180 \text{ Gallons}$
Minimum BTU/hr Input at a 4:1 Turndown Ratio (Low Fire)	$25,200,000 \div 4 = 6,300,000 \text{ BTU}$
Cubic Feet of Natural Gas Required	$6,300,000 \div 1,000 = 6,300 \text{ Cu Ft}$
Cubic Feet of Vaporized Propane Required	$6,300,000 \div 2,500 = 2,520 \text{ Cu Ft}$
Gallons of Liquid Propane Required	$6,300,000 \div 91,600 = 68.7 \text{ Gallons}$
Gallons of #2 Diesel Oil Required	$6,300,000 \div 140,000 = 45 \text{ Gallons}$
Maximum Steam Production in lbs/hr (High Fire)	$600 \times 34.5 = 20,700 \text{ lbs/hr}$
Maximum Water Evaporation Rate	$600 \times .069 = 41.4 \text{ GPM}$
Minimum Feedwater Pump Flow (on / off pump strategy)	$41.4 \times 2 = 82.8 \text{ GPM}$
Minimum Feedwater Pump Flow (modulating pump strategy)	$41.4 \times 1.5 = 62.1 \text{ GPM}$
Minimum Feedwater Tank Storage Requirement	414 Gallons
Steam Temperature at <u>105 psi</u> Saturated	340 °F
BTU/hr Output, Based on 80% Efficiency at High Fire	$25,200,000 \times .80 = 20,160,000 \text{ BTU}$
BTU/hr Output, Based on 80% Efficiency at Low Fire	$6,300,000 \times .80 = 5,040,000 \text{ BTU}$
Square Feet Heating Surface (sq. ft. HS) at 5 sq. ft. per HP	$600 \times 5 = 3,000 \text{ Sq Ft}$
Minimum Steam Safety Relief Valve Capacity at Boiler Design	$20,700 \times 1.10 = 22,700 \text{ lbs/hr}$
Minimum Water Softener Flow Capacity at High Fire (always based upon 100% input)	$41.4 \times 2 = 82.8 \text{ GPM}$

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