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700 HP FIRETUBE BOILER

Maximum BTU/hr Input (ie: Rated Input @ High Fire / 100% Input Rating)	$700 \times 42,000 = 29,400,000 \text{ BTU}$
Cubic Feet of Natural Gas Required	$29,400,000 \div 1,000 = 29,400 \text{ Cu Ft}$
Cubic Feet of Vaporized Propane Required	$29,400,000 \div 2,500 = 11,760 \text{ Cu Ft}$
Gallons of Liquid Propane Required	$29,400,000 \div 91,600 = 321 \text{ Gallons}$
Gallons of #2 Diesel Oil Required	$29,400,000 \div 140,000 = 210 \text{ Gallons}$
Minimum BTU/hr Input at a 4:1 Turndown Ratio (Low Fire)	$29,400,000 \div 4 = 7,350,000 \text{ BTU}$
Cubic Feet of Natural Gas Required	$7,350,000 \div 1,000 = 7,350 \text{ Cu Ft}$
Cubic Feet of Vaporized Propane Required	$7,350,000 \div 2,500 = 2,940 \text{ Cu Ft}$
Gallons of Liquid Propane Required	$7,350,000 \div 91,600 = 80.24 \text{ Gallons}$
Gallons of #2 Diesel Oil Required	$7,350,000 \div 140,000 = 52.5 \text{ Gallons}$
Maximum Steam Production in lbs/hr (High Fire)	$700 \times 34.5 = 24,150 \text{ lbs/hr}$
Maximum Water Evaporation Rate	$700 \times .069 = 48.3 \text{ GPM}$
Minimum Feedwater Pump Flow (on / off pump strategy)	$48.3 \times 2 = 96.6 \text{ GPM}$
Minimum Feedwater Pump Flow (modulating pump strategy)	$48.3 \times 1.5 = 72.45 \text{ GPM}$
Minimum Feedwater Tank Storage Requirement	483 Gallons
Steam Temperature at <u>205 psi</u> Saturated	389 °F
BTU/hr Output, Based on 80% Efficiency at High Fire	$29,400,000 \times .80 = 23,520,000 \text{ BTU}$
BTU/hr Output, Based on 80% Efficiency at Low Fire	$7,350,000 \times .80 = 5,880,000 \text{ BTU}$
Square Feet Heating Surface (sq. ft. HS) at 5 sq. ft. per HP	$700 \times 5 = 3,500 \text{ Sq Ft}$
Minimum Steam Safety Relief Valve Capacity at Boiler Design	$24,150 \times 1.10 = 26,565 \text{ lbs/hr}$
Minimum Water Softener Flow Capacity at High Fire (always based upon 100% input)	$48.3 \times 2 = 96.6 \text{ GPM}$

HQ - Fremont, CA (510) 490-7100 / Sales Office - Visalia, CA (559) 623-9318
Controls Division - Pacific Combustion Engineering - Washougal, WA (360) 335-1443
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