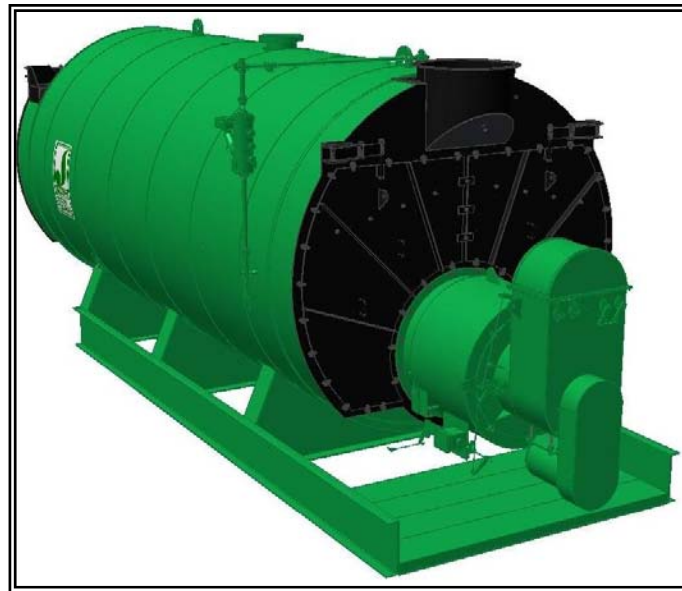




## MODEL: PFTA 500-4

### 4-Pass Steam Packaged Firetube Boiler

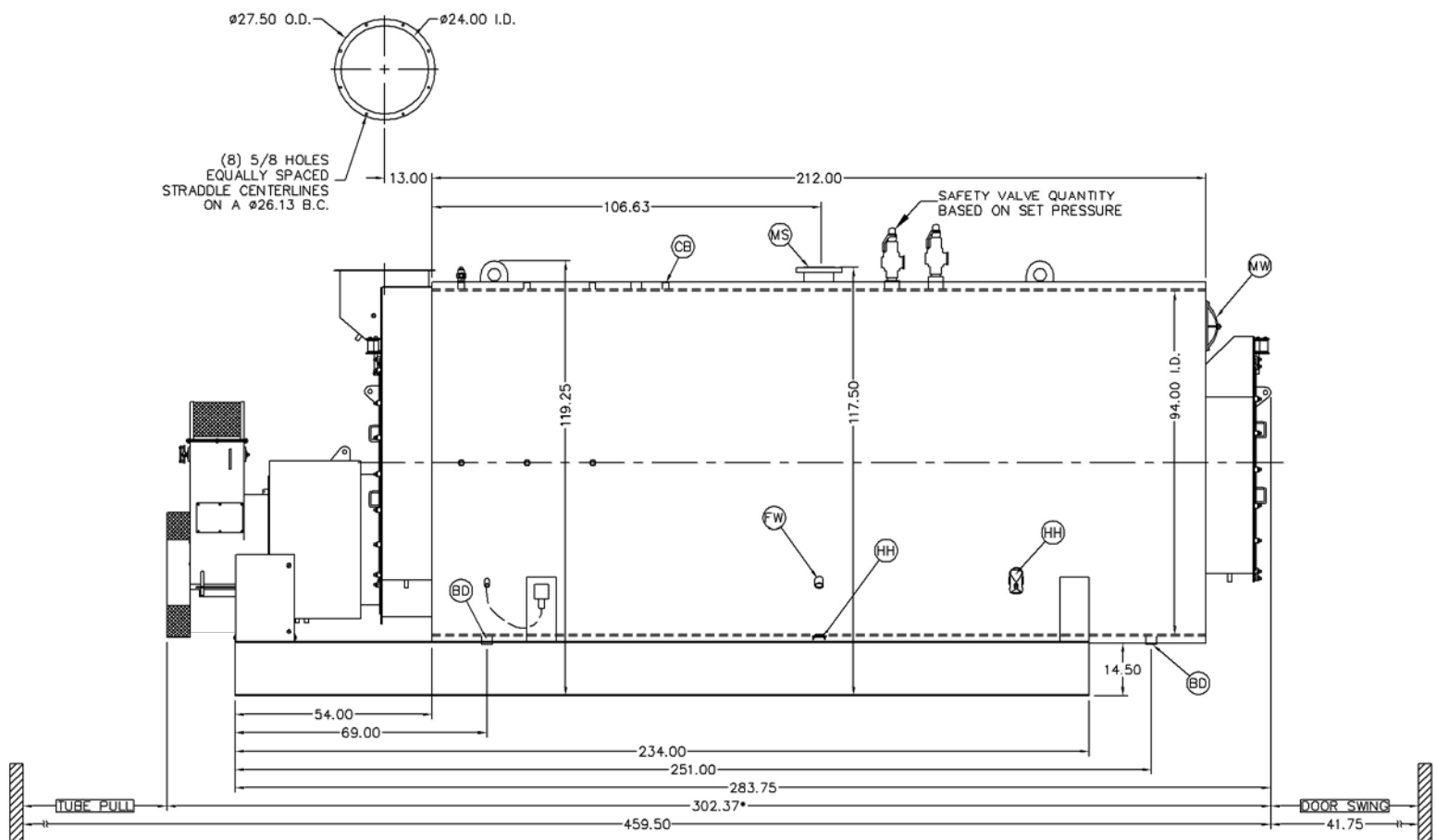
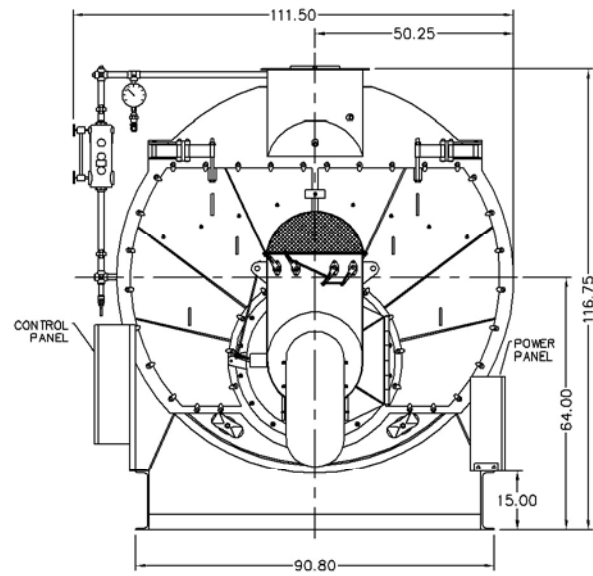


### Ratings & Performance Data

Horsepower 500							
Steam Storage, ft <sup>3</sup>	95.4	Natural Gas Flow, SCFH (1,000 Btu/ft <sup>3</sup> )**	20,185				
Steam Disengaging Area, ft <sup>2</sup>	103.2	Combustion Air (15% Excess), SCFM***	3,694				
Total Heating Surface, ft <sup>2</sup>	2,556	Flue Gas Flow Rate, lb/hr***	17,602				
Furnace Outside Diameter, in	42.0	Stack Flue Gas Velocity, ft/min***	2,026				
Furnace Heat Release Rate, Btu/ft <sup>3</sup> hr**	155,000	#2 Oil Flow, gal/hr (140,000 BTU/gal)**	138.9				
Total Combustion Volume, ft <sup>3</sup>	179.8	#6 Oil Flow, gal/hr (150,000 BTU/gal)**	128.8				
Total Heat Release Rate, Btu/ft <sup>3</sup> hr**	112,000	Flue Gas Side Pressure Drop, in. H <sub>2</sub> O	6.1				
Water Content N.W.L., gal	3,182	Water Content Flooded, gal.	3,895				
Approx. Dry Weight 15#, lb	38,200	Approx. Operating Weight 15#, lb.	64,400				
Approx. Dry Weight 150#, lb	41,700	Approx. Operating Weight 150#, lb.	67,900				
Approx. Dry Weight 200#, lb	44,600	Approx. Operating Weight 200#, lb.	70,800				
Approx. Dry Weight 250#, lb	48,300	Approx. Operating Weight 250#, lb.	74,500				
Approx. Dry Weight 300#, lb	51,500	Approx. Operating Weight 300#, lb.	77,700				
Performance Data							
Operating Pressure (psig)	Steam Rate (lb/hr)	Natural Gas		#2 Oil		#6 Oil	
		Stack Temp (F)	%Eff	Stack Temp (F)	%Eff	Stack Temp (F)	%Eff
10	17,364	278	85.4	287	88.6	297	89.2
50	17,027	336	83.9	345	87.1	356	87.7
100	16,845	377	82.9	385	86.1	397	86.7
150	16,744	405	82.2	414	85.3	426	85.9
200	16,681	427	81.6	436	84.8	449	85.4
250	16,640	446	81.2	455	84.3	468	84.9
300	16,614	462	80.8	471	83.9	485	84.5
*Based on 228°F feedwater and 3% O <sub>2</sub> , ** Values calculated at 100 psi operating pressure, ***Calculated Firing Natural Gas							

## Drawings - 4-Pass Steam Packaged Firetube Boiler

Connection & Opening Schedule			
Conn.	Description	Type	Qty
FW	Feedwater Inlet	2.00 FNPT	2
MS*	Main Steam	8.00 300# RF	1
CB	Continuous Blowoff	1.00 FNPT	1
BD	Blowdown Outlet	2.00 FNPT	2
MW	Manway	12 X 16	1
HH	Hand Hole	4 X 6	7
*12.00 150#RF Flange on 15 psig Design			

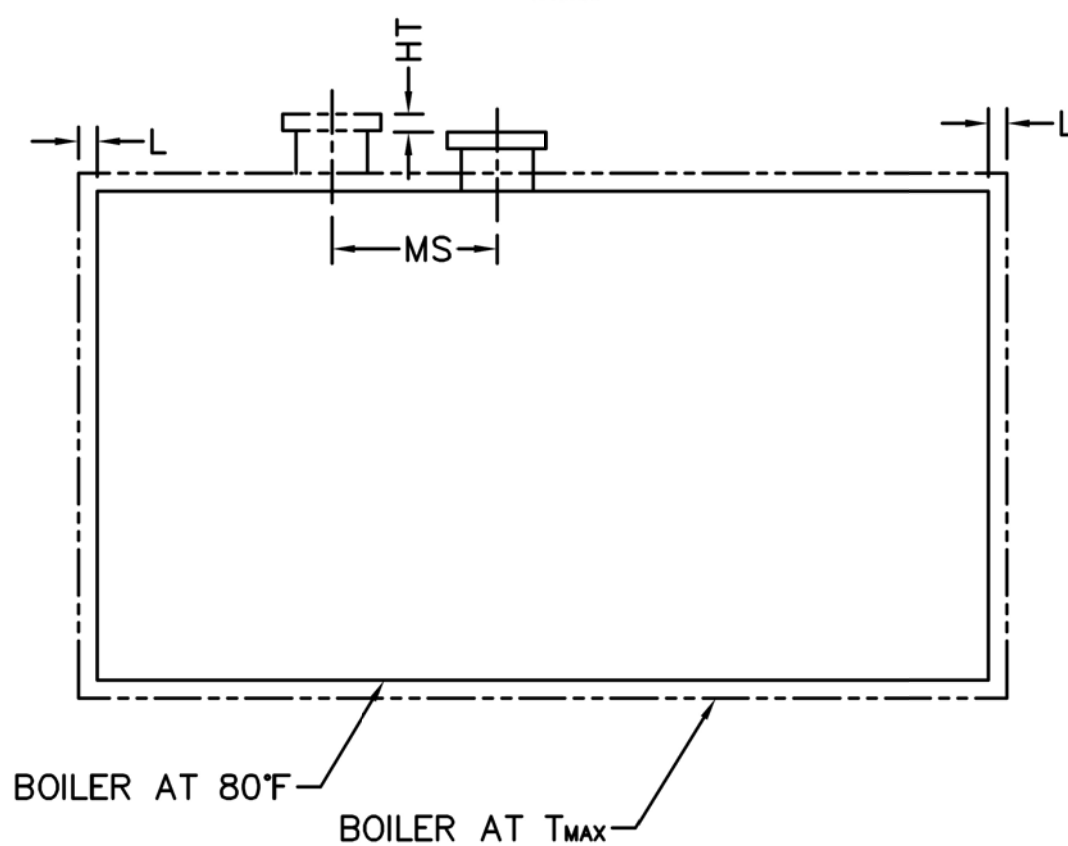
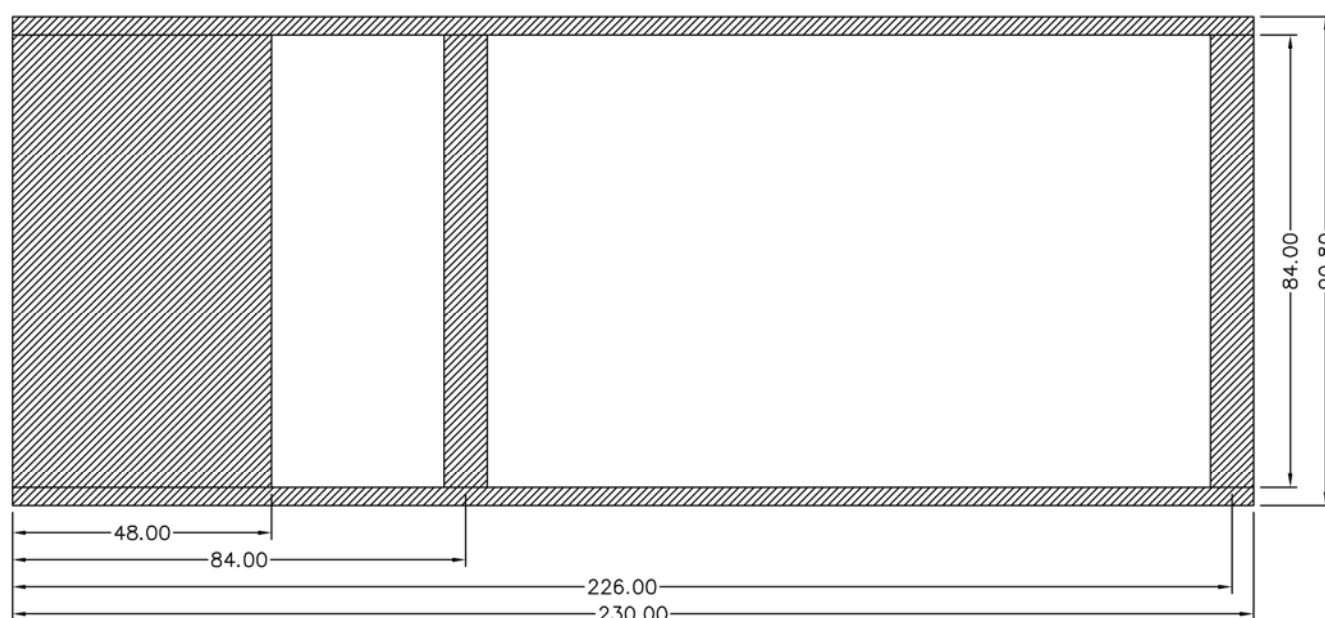


### Notes:

- 150# Steam design shown, all dimensions given in inches.
- Fuel piping and/or optional boiler trim may increase overall width.
- Specifications subject to change to incorporate engineering advances.
- \*May vary on low- $\text{NO}_x$  designs

# MODEL: PFTA 500-4

## Base Diagram

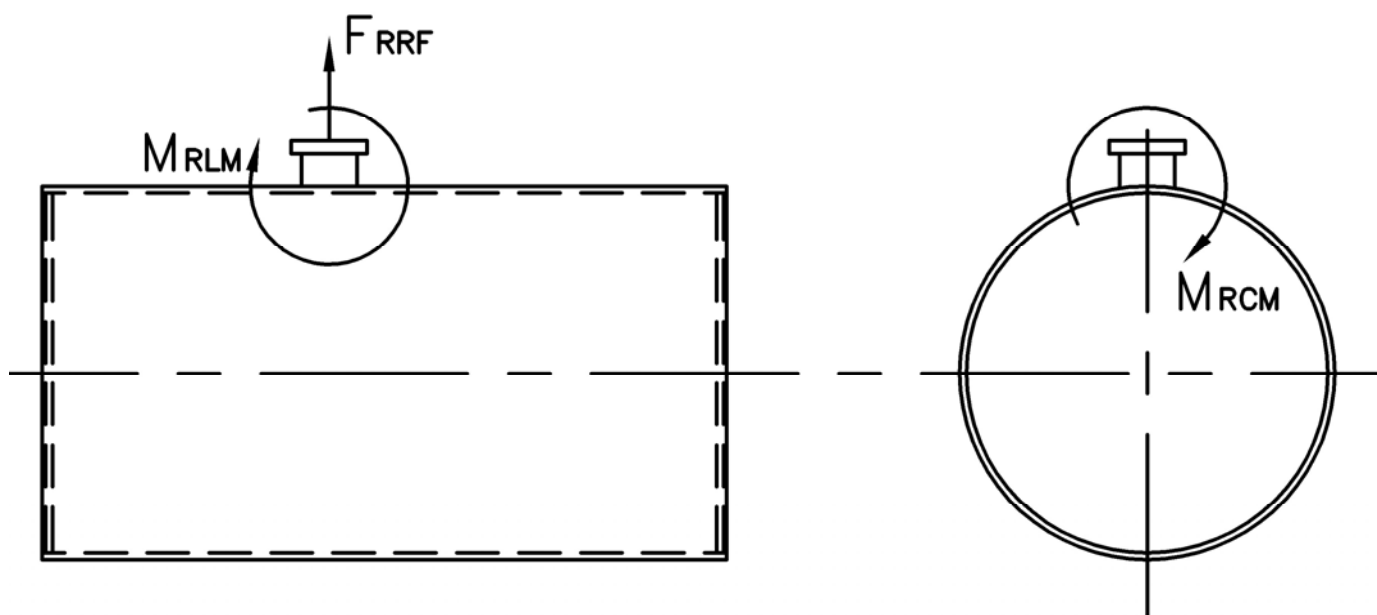


Thermal Expansion					
psig	15	150	200	250	300
Metal T <sub>MAX</sub> (F)	240	366	388	406	421
L (in)	0.108	0.182	0.196	0.207	0.217
MS (in)	0.000	0.000	0.000	0.000	0.000
HT (in)	0.096	0.162	0.175	0.185	0.195

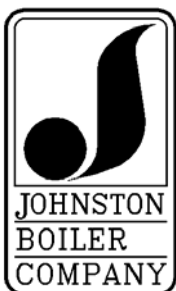
# MODEL: PFTA 500-4

## Nozzle Loadings

Maximum Allowable Load on Boiler Steam Nozzle					
	15# Design	150# Design	200# Design	250# Design	300# Design
$F_{RRF}$ , lb	8,415	3,200	5,345	6,430	6,910
$M_{RCM}$ , in-lb	60,175	39,605	64,530	86,265	109,255
$M_{RLM}$ , in-lb	110,920	32,800	51,925	70,655	76,290



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Stack Emissions-Natural Gas (1,000 Btu/CF)				
	PPMv (Corr to 3% O <sub>2</sub> )	lb/MBtu	lb/hr @ Full Rate	Ton/Yr @ Full Rate
NO <sub>x</sub> *	110	0.131	2.643	11.578
	30	0.036	0.721	3.158
	9	0.011	0.216	0.947
CO	50	0.037	0.74	3.248
CO <sub>2</sub>	2.55 lb/lb fuel	119.76	2,417	10,588
H <sub>2</sub> O	2.03 lb/lb fuel	106.16	2,143	9,386
Stack Emissions-#2 Oil** (140,000 Btu/gal)				
NO <sub>x</sub>	128	0.174	3.387	14.833
CO	50	0.037	0.715	3.130
CO <sub>2</sub>	3.20 lb/lb fuel	168.53	3,278	14,358
H <sub>2</sub> O	1.12 lb/lb fuel	71.20	1,385	6,066

\* 110 ppm "A" Burner, 30 ppm A-FGR Burner, 9 ppm FIR Burner  
\*\*0.02% fuel bound Nitrogen