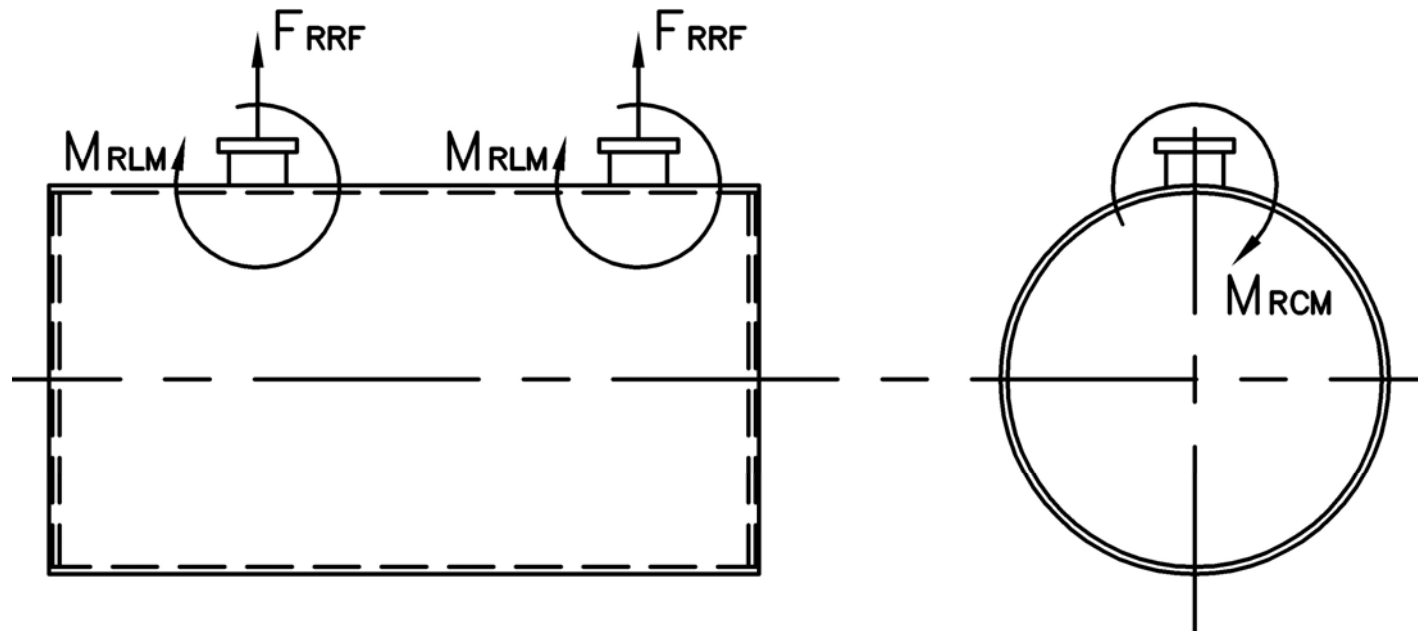


MODEL: PFTA 150-4

Nozzle Loadings

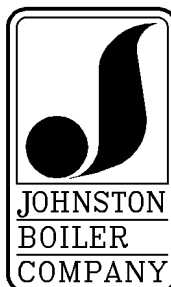
Maximum Allowable Load on Outlet & Return Nozzles				
	30# Design	60# Design	125# Design	160# Design
F _{RRF} , lb	2,605	2,440	3,010	2,855
M _{RCM} , in-lb	12,830	13,750	24,145	24,145
M _{RLM} , in-lb	18,505	16,675	20,475	19,430



Stack Emissions-Natural Gas (1,000 Btu/CF)				
	PPMv (Corr to 3% O ₂)	lb/MBtu	lb/hr @ Full Rate	Ton/Yr @ Full Rate
NO _x *	110	0.131	0.768	3.363
	30	0.036	0.209	0.917
	9	0.011	0.063	0.275
CO	50	0.037	0.22	0.944
CO ₂	2.55 lb/lb fuel	119.76	702	3,076
H ₂ O	2.03 lb/lb fuel	106.16	623	2,727
Stack Emissions-#2 Oil** (140,000 Btu/gal)				
NO _x	128	0.174	0.985	4.316
CO	50	0.037	0.208	0.911
CO ₂	3.20 lb/lb fuel	168.53	954	4,178
H ₂ O	1.12 lb/lb fuel	71.20	403	1,765

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

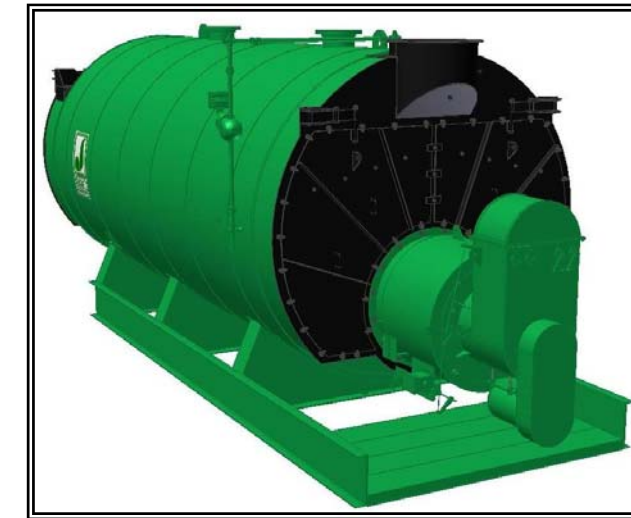
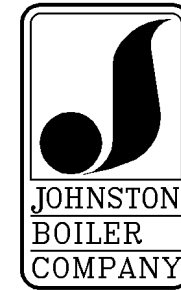
Distributed By:



300 Pine Street
 P.O. Box 300
 Ferrysburg, MI 49409-0300
 Telephone: (616) 842-5050
 Net: www.johnstonboiler.com

MODEL: PFTA 150-4

4-Pass Hot Water Packaged Firetube Boiler



Ratings & Performance Data

Horsepower 150		Natural Gas Flow, SCFH (1,000 Btu/ft ³)**	5,864
Total Heating Surface, ft ²	778	Combustion Air (15% Excess), SCFM***	1,073
Furnace Outside Diameter, in	31.5	Flue Gas Flow Rate, lb/hr***	5,114
Furnace Heat Release Rate, Btu/ft ³ hr**	155,000	Stack Flue Gas Velocity, ft/min***	1,498
Total Combustion Volume, ft ³	59.9	#2 Oil Flow, gal/hr (140,000 Btu/gal)**	40.4
Total Heat Release Rate, Btu/ft ³ hr**	98,000	#6 Oil Flow, gal/hr (150,000 Btu/gal)**	37.3
Water Content Flooded, gal	1,330	Flue Gas Side Pressure Drop, in. H ₂ O	3.2
Approx. Dry Weight 30#, lb	14,500	Approx. Operating Weight 30#, lb	25,600
Approx. Dry Weight 60#, lb	14,700	Approx. Operating Weight 60#, lb	25,800
Approx. Dry Weight 125#, lb	15,000	Approx. Operating Weight 125#, lb	26,100

Operating Temperature (F)	Natural Gas		#2 Oil		#6 Oil	
	Stack Temp (F)	%Eff	Stack Temp (F)	%Eff	Stack Temp (F)	%Eff
180	245	86.1	257	89.2	255	90.2
200	265	85.6	276	88.7	274	89.7
220	284	85.1	295	88.2	294	89.2
240	303	84.6	314	87.7	314	88.7

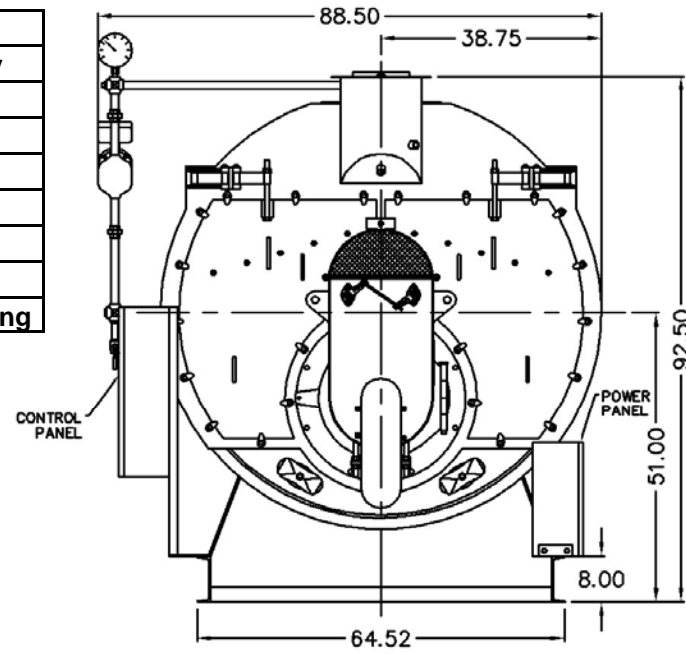
*Based on 20°F difference in supply/return, ** Values calculated at 200°F operating temperature, ***Calculated Firing Natural Gas

Drawings - 4-Pass Hot Water Packaged Firetube Boiler

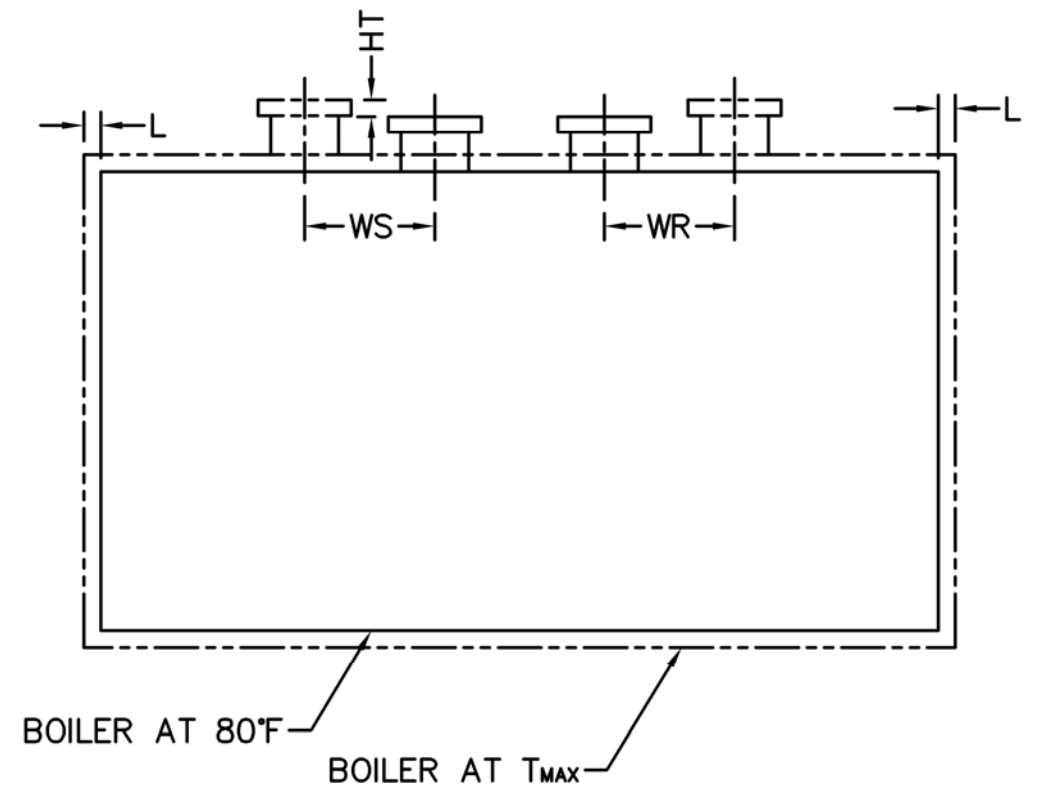
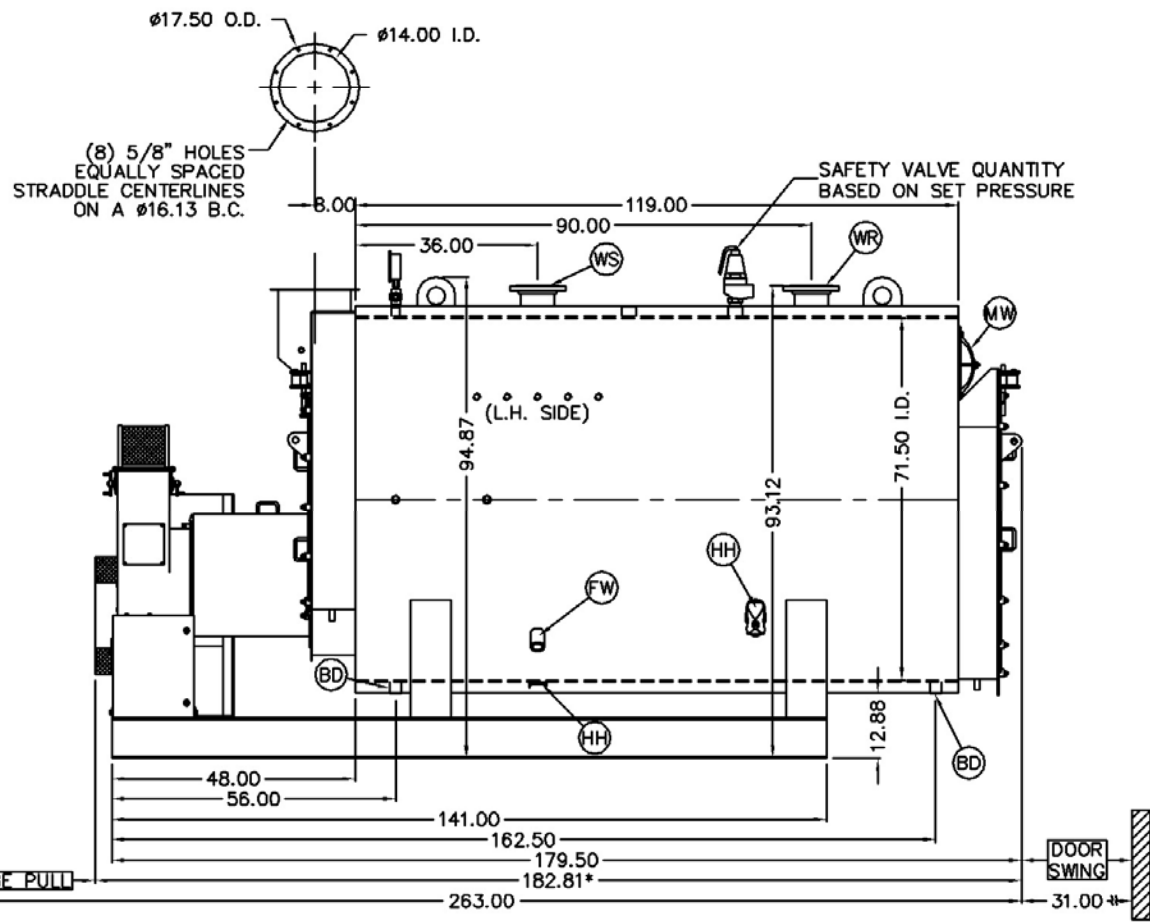
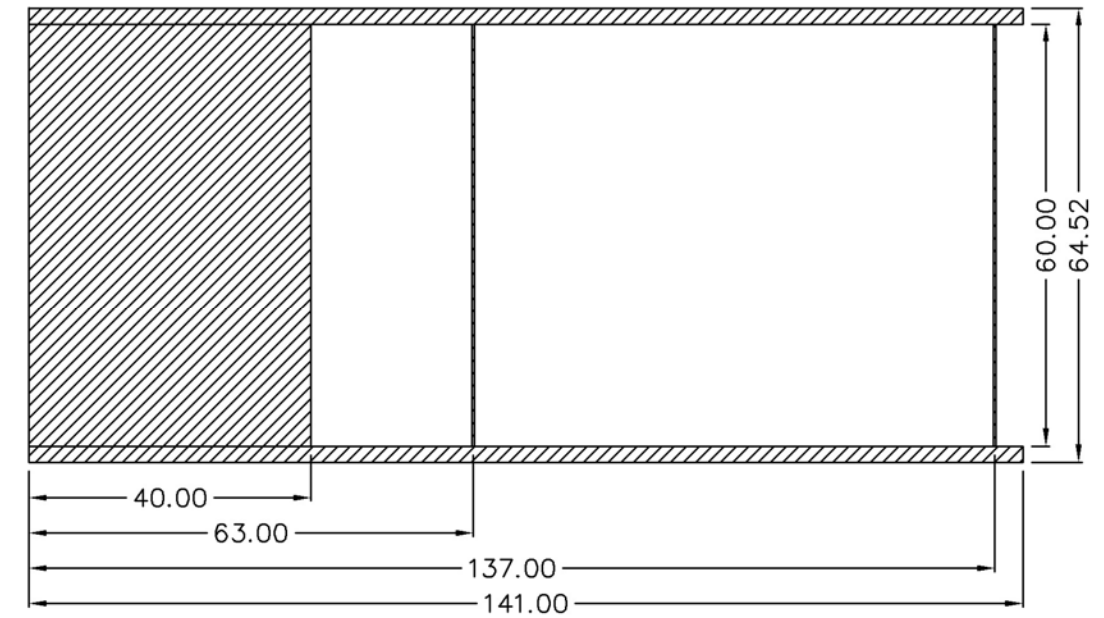
MODEL: PFTA 150-4

Connection & Opening Schedule			
Conn.	Description	Type	Qty
FW	Feedwater Inlet	1.50 FNPT	2
WS	Water Supply	6.00 150#RF	1
WR	Water Return	6.00 150#RF	1
DO	Drain Outlet	1.50 FNPT	2
MW	Manway	12 X 16	1
HH	Hand Hole	4 X 6	6

Supply and return outlets ASME flanged drilling



Base Diagram



Notes:
 30# Hot Water 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-NO_x designs.

Thermal Expansion				
Metal T _{MAX} (F)	180	200	220	240
L (in)	0.036	0.043	0.050	0.057
WS (in)	0.014	0.017	0.020	0.023
WR (in)	0.018	0.022	0.026	0.029
HT (in)	0.043	0.052	0.060	0.069