

MODEL: PFTA 100-4

4-Pass Hot Water Packaged Firetube Boiler

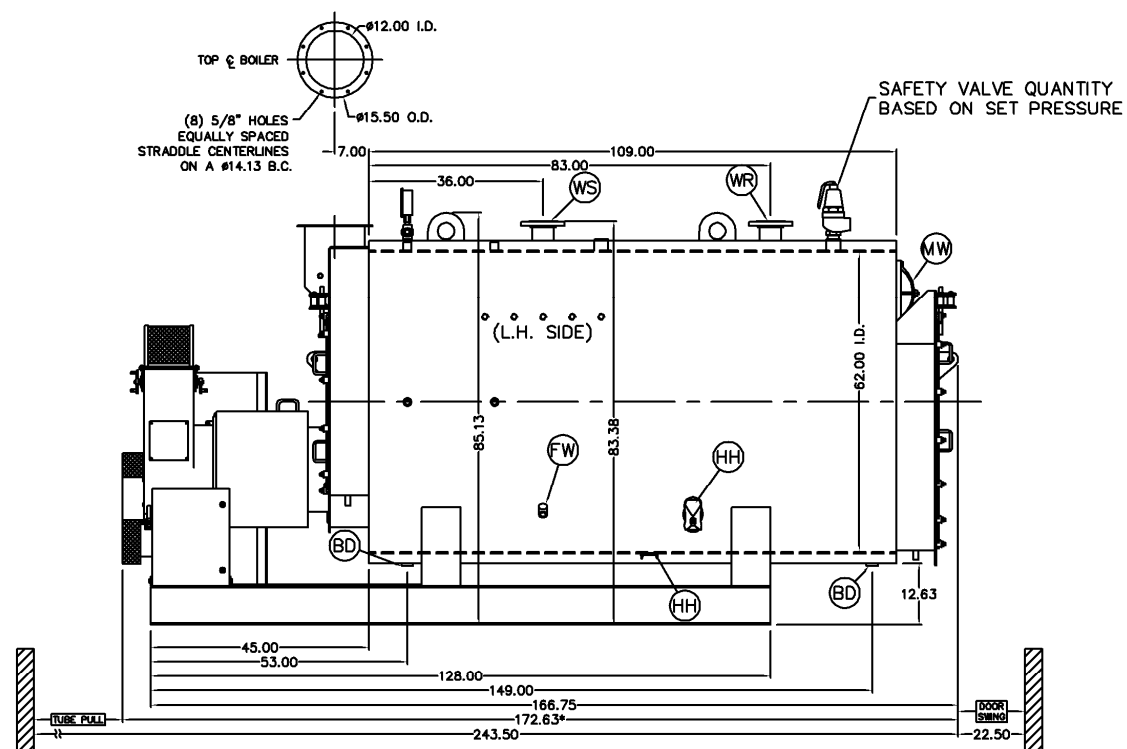
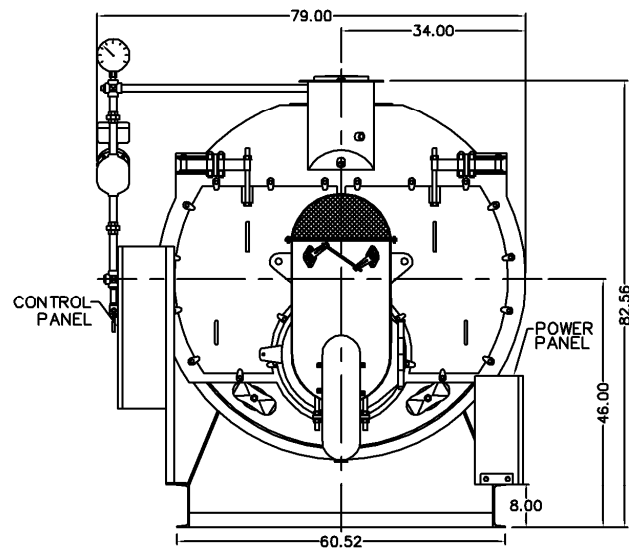


Ratings & Performance Data

| | | | | | | |
|---|----------------|---|------------|--------|----------------|------|
| Horsepower 100 | | Natural Gas Flow, SCFH (1,000 Btu/ft ³)** | | 3,929 | | |
| Total Heating Surface, ft ² | 507 | Combustion Air (15% Excess), SCFM*** | | 719 | | |
| Furnace Outside Diameter, in | 24.0 | Flue Gas Flow Rate, lb/hr*** | | 3,427 | | |
| Furnace Heat Release Rate, Btu/ft ³ hr** | 206,000 | Stack Flue Gas Velocity, ft/min*** | | 1,393 | | |
| Total Combustion Volume, ft ³ | 33.8 | #2 Oil Flow, gal/hr (140,000 Btu/gal)** | | 27.1 | | |
| Total Heat Release Rate, Btu/ft ³ hr** | 116,000 | #6 Oil Flow, gal/hr (150,000 Btu/gal)** | | 25.0 | | |
| Water Content Flooded, gal | 982 | Flue Gas Side Pressure Drop, in. H ₂ O | | 2.8 | | |
| Approx. Dry Weight 30#, lb | 11,900 | Approx. Operating Weight 30#, lb | | 20,100 | | |
| Approx. Dry Weight 60#, lb | 12,000 | Approx. Operating Weight 60#, lb | | 20,200 | | |
| Approx. Dry Weight 125#, lb | 12,400 | Approx. Operating Weight 125#, lb | | 20,600 | | |
| Performance Data* | | | | | | |
| Operating Temperature (F) | Natural Gas | | #2 Oil | | #6 Oil | |
| | Stack Temp (F) | %Eff | Stack Temp | %Eff | Stack Temp (F) | %Eff |
| 180 | 260 | 85.7 | 273 | 88.7 | 270 | 89.7 |
| 200 | 279 | 85.2 | 292 | 88.2 | 289 | 89.2 |
| 220 | 298 | 84.7 | 311 | 87.7 | 309 | 88.7 |
| 240 | 317 | 84.2 | 330 | 87.2 | 328 | 88.2 |
| *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

| Connection & Opening Schedule | | | |
|---|-----------------|-------------|-----|
| Conn. | Description | Type | Qty |
| FW | Feedwater Inlet | 1.00 FNPT | 2 |
| WS | Water Supply | 4.00 150#RF | 1 |
| WR | Water Return | 4.00 150#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 | | | |

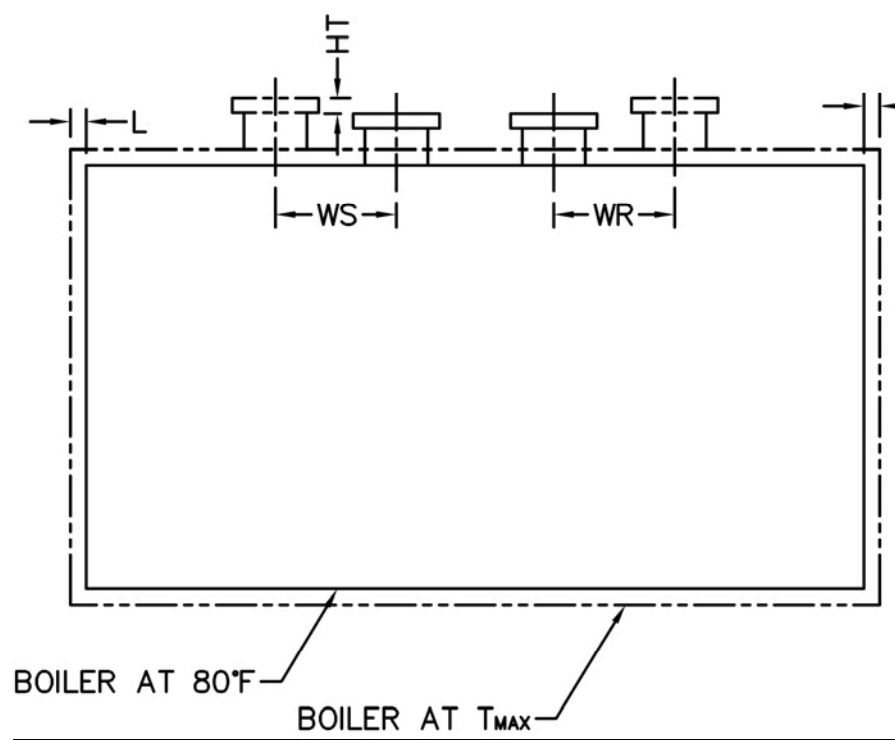
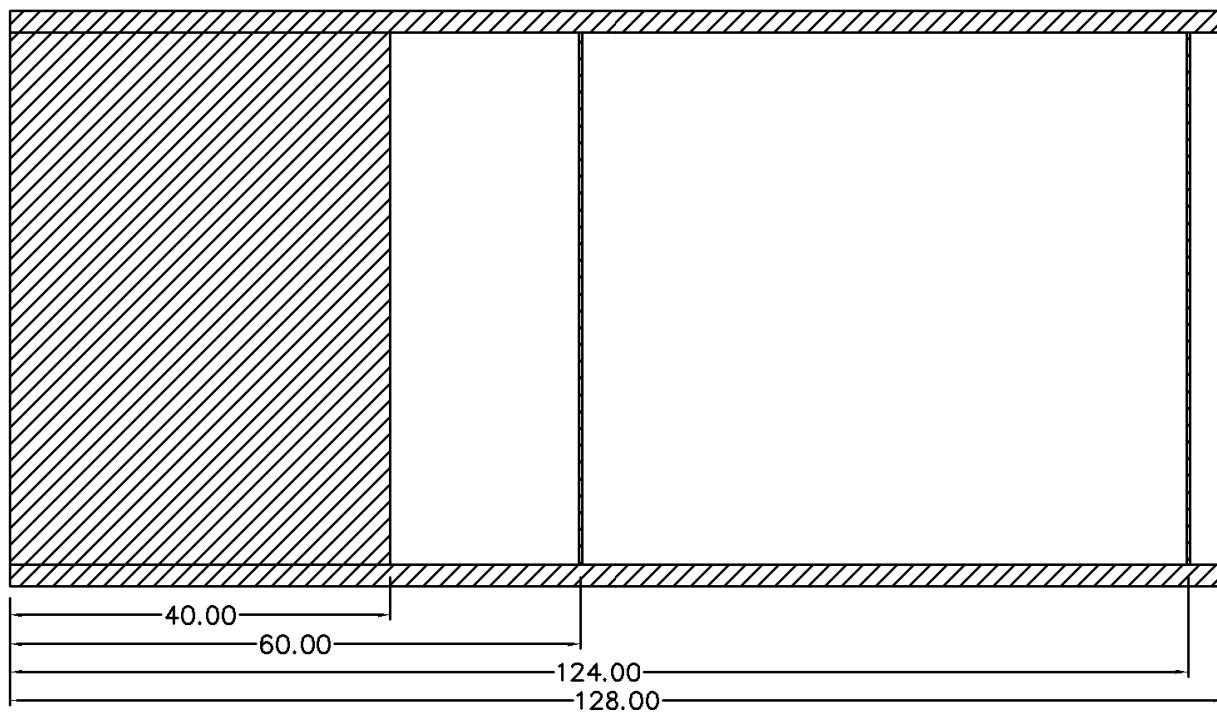


Notes:

- 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.

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Base Diagram

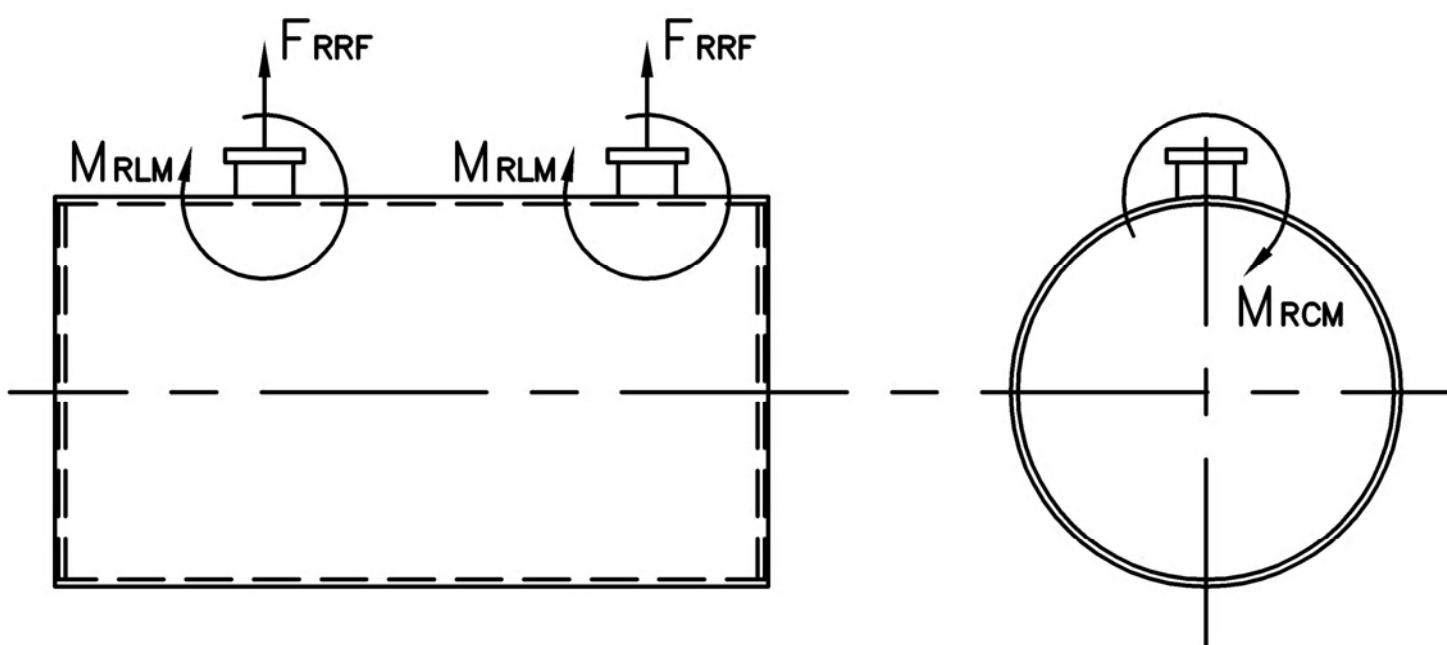


| Thermal Expansion | | | | |
|----------------------------|-------|-------|-------|-------|
| Metal T _{MAX} (F) | 180 | 200 | 220 | 240 |
| L (in) | 0.033 | 0.039 | 0.046 | 0.052 |
| WS (in) | 0.011 | 0.013 | 0.016 | 0.018 |
| WR (in) | 0.017 | 0.021 | 0.024 | 0.027 |
| HT (in) | 0.037 | 0.045 | 0.052 | 0.060 |

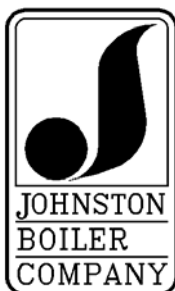
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Nozzle Loadings

| Maximum Allowable Load on Outlet & Return Nozzles | | | | |
|---|------------|------------|-------------|-------------|
| | 30# Design | 60# Design | 125# Design | 160# Design |
| F_{RRF} , lb | 2,200 | 1,865 | 1,230 | 2,100 |
| M_{RCM} , in-lb | 8,380 | 8,380 | 8,380 | 14,645 |
| M_{RLM} , in-lb | 12,130 | 10,190 | 6,720 | 10,495 |



Distributed By:



300 Pine Street
P.O. Box 300
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Telephone: (616) 842-5050
Net: www.johnstonboiler.com

| 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 | 0.515 | 2.254 |
| | 30 | 0.036 | 0.140 | 0.615 |
| | 9 | 0.011 | 0.042 | 0.184 |
| CO | 50 | 0.037 | 0.14 | 0.632 |
| CO ₂ | 2.55 lb/lb fuel | 119.76 | 471 | 2,061 |
| H ₂ O | 2.03 lb/lb fuel | 106.16 | 417 | 1,827 |
| Stack Emissions-#2 Oil** (140,000 Btu/gal) | | | | |
| NO _x | 128 | 0.174 | 0.660 | 2.893 |
| CO | 50 | 0.037 | 0.139 | 0.610 |
| CO ₂ | 3.20 lb/lb fuel | 168.53 | 639 | 2,800 |
| H ₂ O | 1.12 lb/lb fuel | 71.20 | 270 | 1,183 |

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