



PRECISION BOILERS

FPW VERTICAL FIRETUBE GAS/OIL WATER HEATER



STANDARD FEATURES AND ACCESSORIES

- Built per NEC and UL, with UL Label
- Pressure Vessel built to ASME Code Section IV and National Board Registered (125 or 150 PSI design)
- Seamless Steel Firetubes with Solid Copper Overlay (0.04 in. thick/ mechanically bonded)
- Turbulators for maximum heat transfer
- 4-Piece Construction (vent collector + tank + combustion chamber + burner)
- Structural Steel Skid
- 16 Gauge Steel Jacket (Square Jacket Std)
- High Density Insulation
- **"Precision Seal"** lining NSF-61 Compliant (polymerized epoxy) of water surfaces not in contact with combustion gases
- Upper and lower Magnesium Anodes
- High efficiency UL Listed Power Flame power gas, light oil, or combination burners
- Heat transfer area closely matched to burner to obtain 82 - 84% efficiency
- Main & Auxiliary Solenoid Gas/Oil Valves
- Honeywell Combustion Controls
- Main Gas Regulator and Cock, and/or Oil Pump
- Air Proving Switch (gas only)
- Flame Inspection Port
- Tank Inspection Openings (3)
- Standard mechanical trim to include:
 - Temperature Control
 - Upper Operating Limit (Auto Reset)
 - Temperature Limit (Manual Reset)
 - Low Water Cutoff (Manual Reset w/test button & pilot light)
 - P & T Gauges
 - P & T Relief Valve(s)
 - Full Port Drain Valve

OPTIONAL EQUIPMENT AND ACCESSORIES

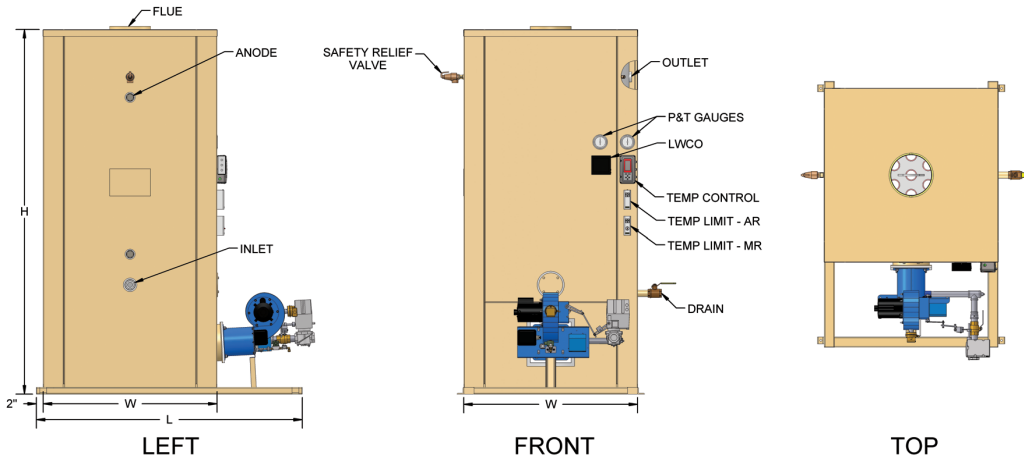
- Low NOx (<30ppm) Burner System
- Wide Choice of Burners
- Cement Lining (NSF Compliant)
- Integral Tank Circulator
- Motorized Gas Valve(s)
- CSD-1 Compliance (units >400,000 BTU)
- FM or IRI Compliance
- Barometric Draft Damper
- Fireeye Combustion Control
- Outside Air Intake Adapter for Sealed Combustion
- All Stainless Steel Construction (deionized water/210°F max)
- Stainless Steel Vessel w/Copper clad tubes (deionized water/210°F max)
- Thermal Expansion Relief Valve
- Hi/Lo Tank Pressure Switches
- Side or Rear Flue Outlet



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FPW DIMENSIONAL DATA



NOTE: MINIMUM OF 18" CLEARANCE AROUND BOILER.

PHYSICAL DATA

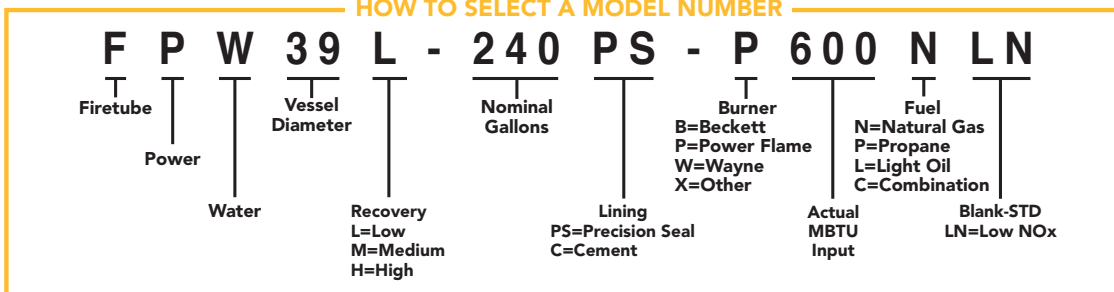
MODEL NUMBER	VESSEL DIMS		NOMINAL GALLONS	DIMENSIONS (IN.)			CONNECTIONS (NPT)		MAX BURNER INPUT (MBH)			WEIGHTS (LBS)**	
	DIA	HEIGHT		W	L***	H****	IN/OUT	DRAIN	LOW*	MEDIUM*	HIGH*	SHIP	OPER
FPW-24_-0100	24	51	100	28	50	86	1-1/4"	1"	150	230	280	1450	2150
FPW-31_-0120	31	36	120	35	57	71	1-1/4"	1"	200	250	340	1760	2600
FPW-31_-0160	31	48	160	35	57	83	1-1/4"	1"	240	310	450	1900	3020
FPW-31_-0200	31	60	200	35	57	95	1-1/4"	1"	290	380	560	2150	3540
FPW-39_-0210	39	42	210	43	65	77	1-1/2"	1"	510	700	780	2480	3920
FPW-39_-0240	39	48	240	43	65	83	1-1/2"	1"	570	790	900	2680	4350
FPW-39_-0300	39	60	300	43	65	95	1-1/2"	1"	690	970	1120†	3060	5150
FPW-39_-0360	39	72	360	43	65	107	1-1/2"	1"	810	1140†	1180†	3460	5970
FPW-46_-0350	46	48	350	50	72	83	2"	1-1/2"	800	970	1380†	3160	5600
FPW-46_-0425	46	60	425	50	72	95	2"	1-1/2"	970	1190	1540†	3640	6200
FPW-46_-0500	46	72	500	50	72	107	2"	1-1/2"	1130	1400†	1570†	4120	7610
FPW-58_-0550	58	48	550	62	84	83	2"	1-1/2"	1200	1500	2200†	4160	7990
FPW-58_-0675	58	60	675	62	84	95	2"	1-1/2"	1460	1830	2850†	4800	9510
FPW-58_-0800	58	72	800	62	84	107	2"	1-1/2"	1710	2150	2910†	5430	11010
FPW-62_-0750	62	60	750	66	88	95	3"	1-1/2"	1950	2360	3220†	5430	10660
FPW-62_-0900	62	72	900	66	88	107	3"	1-1/2"	2290	2790†	3470†	6170	12440
FPW-62_-1000	62	78	1000	66	88	113	3"	1-1/2"	2520	3000†	3520†	6550	13520
FPW-69_-0950	69	60	950	73	95	95	3"	1-1/2"	2380	2930	3590†	6240	12860
FPW-69_-1150	69	72	1150	73	95	107	3"	1-1/2"	2800	3460†	4310†	7110	15130
FPW-69_-1250	69	78	1250	73	95	113	3"	1-1/2"	3010	3730†	4430†	7560	16280
FPW-76_-1200	76	60	1200	81	103	95	3"	1-1/2"	2960	3600	4150†	7120	15490
FPW-76_-1400	76	72	1400	81	103	107	3"	1-1/2"	3480	4260†	4930†	8130	17890
FPW-76_-1500	76	78	1500	81	103	113	3"	1-1/2"	3740	4580†	4970†	8640	19100

* "Low", "Medium" and "High" refer to the unit's installed heat transfer area (ie, min, nom and max number of tubes).

** Weights are approximate and are based on the "Medium" recovery configuration.

+ Indicates poured refractory - add 20% to unit shipping weights and same amount to unit operating weights; add 2" to both 'H' dimension & inlet height.

HOW TO SELECT A MODEL NUMBER





PRECISION BOILERS

FPW VERTICAL FIRETUBE GAS/OIL WATER HEATER

BURNER OPTIONS

As with all power-fired heaters, the burner is the heart of the unit. PRECISION has chosen as its standard the "Power Flame" burner for the majority of applications, and the "Beckett" burner as the economical choice for the low end oil burner, with other burners available as options. The "Power Flame" burner is one of the industry's leading burners and is well suited for this application. The FPW heater's large combustion chamber and optimally sized heat release area have been carefully matched to the burner size to assure 82-84% efficiency. The oil and combination gas/oil burners have been sized to obtain at least 84% efficiency. The proven Honeywell combustion control system is provided as standard for gas/oil burners with other systems available as options. PRECISION gas-fired FPW units are suitable, per UL requirements, for use with type B venting provided that the stack design creates a negative pressure at the boiler flue connection, and that the flue gas temperature does not exceed ambient by greater than 400° F.

Note: Burner model number suffixes shown in the tables below indicate max burner inputs. The model numbers should be modified to indicate the actual BTU input required (eg, a-P600 is the correct model number for 600 MBTU input).

Precision now offers a low NO_x option to meet 30ppm NO_x regulations. This option uses the "Power Flame" induced flue gas recirculation system in a fully UL Listed package for 250 MBTU and up.



BURNER DATA – GAS

MODEL NO SUFFIX ①	MBTU INPUT RANGE	MAX BHP	MAX OUTPUT MBTU②	SIZES (IN.)		BLOWER HP (1 ph)	MAX RECOVERY GPH vs TEMP RISE		
				GAS	FLUE ③		80F	100F	120F
-PX400 ④	100-400	9.5	328	3/4	6	1/4	492	394	328
-PX700 ④	401-725	17.2	595	1	6	1/4	892	713	600
-P420	250-420	10.0	344	1	6	1/4	517	413	345
-P700	421-700	16.7	574	1	8	1/4	861	689	574
-P840	701-840	20.0	689	1	8	1/3	1034	827	689
-P1075	841-1075	25.6	882	1-1/4	10	1/3	1323	1058	882
-P1260	1076-1260	30.0	1033	1-1/4	10	1/3	1550	1240	1034
-P1674	1261-1674	40.0	1373	1-1/2	12	1/3	2060	1648	1373
-P2200	1675-2200	52.3	1804	1-1/2	12	1/3	2707	2166	1805
-P2500	1400-2500	60.0	2050	2	14	3/4	3076	2461	2051
-P3080	2240-3080	73.5	2526	2	14	1	3790	3032	2527

BURNER DATA – OIL

MODEL NO SUFFIX ①	MBTU INPUT RANGE	RATED GPH	MAX BHP	MAX OUTPUT MBTU ⑤	FLUE ③ SIZES (IN.)	BLOWER HP (1 ph)	MAX RECOVERY GPH vs TEMP RISE		
							80F	100F	120F
-B315	175-315	1.25-2.25	7.2	268	6	1/4	396	317	265
-B630	316-630	2.25-4.5	15.0	530	6	1/4	794	635	529
-B770	631-770	4.5-5.5	18.3	647	8	1/3	971	776	647
-B1120	420-1120	3-8	26.6	940	10	1/3	1414	1130	742
-P1360	560-1360	4-9.7	32.3	1142	10	1/2	1714	1371	1143
-P2200	1400-2200	10-15.7	52.3	1848	12	3/4 ⑥	2773	2218	1849
-P3080	2240-3080	16-22	73.5	2587	14	1-1/2	3882	3106	2588

BURNER DATA – COMBINATION GAS/OIL

MODEL NO SUFFIX ①	MBTU INPUT RANGE	RATED GPH	MAX BHP	MAX OUTPUT MBTU ⑤	FLUE ③ SIZES (IN.)	BLOWER HP (1 ph)	MAX RECOVERY GPH vs TEMP RISE		
							80F	100F	120F
-P980	420-980	3-7	23.5	804	8	1/3	1206	965	804
-P1360	560-1360	4-9.7	32.3	1115	10	1/2	1673	1339	1116
-P2200	700-2200	5-15.7	52.3	1804	12	3/4	2707	2166	1805
-P2500	840-2500	6-15.7	60	2050	12	1	3076	2461	2051
-P3080	980-3080	7-22	73.5	2526	14	1-1/2⑥	3790	3032	2527

① Prefix of model number indicates burner supplier (B=Beckett, P=Power Flame); Suffix model number with 'N' for Natural Gas, 'P' for Propane, 'L' for #2 Fuel Oil, 'C' for Combination Gas and #2 Fuel Oil.

② Max output is based on 82% efficiency.

③ Flue sizes are based on input; 6" under 420 MBTU, 8" for 420 to 840 MBTU, 10" for 850 to 1260 MBTU, 12" for 1270 to 2200 MBTU, and 14" for 2210 to 3080 MBTU.

④ These burners use the Honeywell S8680J Combustion Control.

⑤ Max output is based on 84% efficiency.

⑥ These motors are 3-phase in which case a Control Transformer is included for the Control Circuit.



PRECISION BOILERS

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SUPERIOR TANK LINING

Precision Seal Lining

PRECISION SEAL is a highly water-resistant polymerized epoxy material designed primarily as a tank lining for water, including low conductivity deionized or distilled water at elevated temperature. It is designed for use with potable water up to 160°F. PRECISION SEAL is NSF-61 compliant and after complete fabrication of the tank, two separate coats of PRECISION SEAL are applied to a minimum dry film thickness of 5 to 6 mils per coat. Each coat is baked and forced-cured in a high temperature oven. The lining is then 100% checked for "holidays" using the electrical "Tinkle Test" process. This 10 to 12 mils of epoxy offers protection against corrosion and leaves a smooth interior tank surface to prevent build up of algae and precipitants. This lining does not impart taste, color or odor. It is extremely tough, flexible and abrasive resistant.

Hydraulic Calcium Oxide Cement Lining (NSF-61 Compliant)

The Cement Lining covers the inside of the fabricated tank and bonds directly to the steel forming a hard one piece lining to protect against corrosion. It is the best lining choice for high temperature service (temperatures from 160°F to 250°F), with the cement formulated to have the same coefficient of expansion as medium steel. After tank fabrication, expanded metal may be tack-welded to the vessel interior, then cement is applied to a minimum thickness of 5/8". While this lining offers competitive pricing, it, like all linings, requires annual inspection to fulfill the terms of the warranty.

LIMITED WARRANTY

This limited warranty applies only if the installation and operating instructions applicable to the model purchased are expressly and completely followed. Commercial tanks, water heaters, and boilers are warranted for five (5) years against tank leakage and one (1) year on parts.

- I. Tank Warranty: PRECISION warrants all tanks for a period of five (5) years from the date of shipment. If the original vessel of this unit should leak or should prove to be defective, PRECISION will, at its option repair, replace with a new vessel, or replace with a new heater of equivalent size, at no charge for the first three (3) years and prorated for the next two (2) years.
All lined tanks require annual inspection and replacement of anode rods to validate this warranty. Tanks with Cement Linings are warranted for a period of ten (10) years. Under the conditions described above, tanks with these linings are warranted at no charge for five (5) years and prorated for the next five (5) years.
- II. Parts Warranty: PRECISION warrants all parts (except pilot lights, fuses and gaskets) for a period of one (1) year from startup, or 18 months after the date of shipment, whichever comes first. If any part of this heater should fail due to a defect in materials and workmanship, PRECISION will replace with a new part of same or equivalent model.
The following conditions are stipulated for Paragraphs I & II:
 1. Failure of tank or parts must be confirmed through inspection by our representative.
 2. Replacement tank, heaters, or parts will be invoiced at current retail price.
 3. Full credit or prorated credit will be issued upon the return of defective tanks, heater, or parts to PRECISION.

4. All replacement tanks, heaters or parts will be shipped FOB shipping point, freight collect.
 5. Warranty does not cover production of noise, taste, odors, discoloration or rusty water.
- III. This warranty will be void if any of the following conditions are found to exist:
1. Operation of heater while tank water level is below heating elements.
 2. Leakage resulting from lime or sediment precipitates, damaged fittings, abuse or misuse by the customer, or defective installations.
 3. Firing of heater in excess of BTU or voltage ratings stated on Data Plate.
 4. Installation in other than original installation location or with improper pressure relief valve.
 5. Ownership by other than original purchaser.
 6. Unit not installed, adjusted or maintained in accordance with installation and operating instructions and all applicable state and local plumbing, electrical and building codes, ordinances, and regulations.
- IV. Any replacement or repaired part is warranted only for the balance of the period in the original warranty.
- V. PRECISION will not be held liable for any labor, freight charges, permits, loss of time, consequential damages, installation cost, removal cost, or contingent liability of any kind resulting from the manufacture, sale, installation, or use of this unit, or to the failure of item excluded from this warranty under paragraph II above.
- VI. This limited warranty is in lieu of any and all other warranties and/or guarantees expressed or implied.



PRECISION BOILERS

FPW VERTICAL FIRETUBE GAS/OIL WATER HEATER

SPECIFICATIONS

1. GENERAL

Furnish and install as shown on the plans a PRECISION Storage Water Heater Model FPW-_____ which shall be a complete pretested, packaged unit consisting of a (gas) (oil) power burner with integral heat exchanger and hot water storage vessel, complete with all required operating and safety controls. Each heater shall have a (nominal) (actual) storage capacity of _____ gallons. The complete heater shall be UL labeled and shall include a pressure vessel built to the requirements of ASME Section IV, designed for (125) (150) PSIG, and National Board registered. A copy of the Manufacturer's Data Report shall be provided to the **owner**.

2. POWER BURNER (SELECT ONE)

- A. Gas-Fired Burner with a recovery capacity of _____ GPH water from _____ °F to _____ °F, with an input of _____ BTU/H (natural gas) (propane).
- B. Oil-Fired Burner with a recovery capacity of _____ GPH water from _____ °F to _____ °F, with an input of _____ BTU/H (#1) (#2) fuel oil.
- C. Gas-Oil Combination Burner with a recovery capacity of _____ GPH water from _____ °F to _____ °F, with an input of _____ BTU/H (natural gas) (propane) and _____ (#1) (#2) fuel oil.

3. CONTROLS AND SAFETY DEVICES

Each heater shall be equipped with an ASME pressure and temperature relief valve(s), separate pressure and temperature gauges, temperature control, upper temperature limit (auto reset), upper temperature limit (manual reset), low water cutoff (manual reset w/ test button and pilot light), and drain valve.

4. BURNER CONTROLS

A. Natural or Propane Gas

120V control power with 24V combustion control, redundant gas valves, flame rod sensor with 4 sec safety shutdown, 30 sec prepurge, combustion air

proving switch, direct spark ignition with 7300V ignition transformer, 3200 RPM motor. Burner to have primary air adjustment (with) (without) optional outside air intake adapter.

B. Oil

120V control power with 3500 RPM fuel pump, cadmium sulfide cell and relay control, 10,000 V Constant duty ignition transformer, solenoid oil valve(s). Burner to have primary air adjustment (with) (without) optional outside air intake adapter.

5. ENCLOSURE

The pressure vessel shall be insulated with a minimum of 4 inches of 3/4 pound density fiberglass insulation (or equivalent) and shall be enclosed in an enameled sheet steel enclosure. The assembly shall conform to heat loss requirements of ASHRAE 90 and ANSI Z21.10.3.

6. VESSEL LINING

Heat exchanger shall utilize copper clad firetubes, with a min copper thickness of 0.04", and storage vessel shall be lined with (PRECISION SEAL) or (Cement) as follows: (Insert one of the following paragraphs that applies to your selection of linings)

6.1 PRECISION SEAL (NSF-61 Compliant): The tank shall be lined with two separate coats of this polymerized epoxy to a minimum of 5-6 mils per coat to tank interior. Each Coat is baked and force cured in an oven.

6.2 Cement (NSF-61 Compliant): The lining shall be a hydraulic calcium oxide cement good for service temperatures to 250°F with the same coefficient of expansion as medium steel. The water absorption of the lining material shall not be more than 8% of the dryweight. The cement shall be applied to a minimum thickness of 5/8" to the interior of the Storage Tank to form a hard, one-piece lining.



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CONTACT US FOR THESE QUALITY PRODUCTS

- Electric Hot Water and Steam Boilers 10KW-5000KW to 3000 PSI; Carbon Steel & Stainless Steel
- Electric Storage Heaters 125 to 5500 Gallons
- Electrode High Voltage Boilers
- Thermal Storage Systems Space Heating & Domestic or Process
- Water; Electric, Gas or Steam Fired
- Pressure Vessels Water Storage Tanks Flash Tanks Blowdown Tanks
- Unfired Hot Water and Steam Generators
- Boiler Feedwater Systems
- Deaerators and Surge Tanks
- Steam Superheaters-Electric
- Circulation Heaters-Electric
- Gas or Oil-Fired WaterTube Boilers (Flextube Type)
- Chemical Bypass Feeders and Automatic Chemical Feed Systems

NOTE: In pursuing our policy of continuous development of products, PRECISION reserves the right to vary any detail in this bulletin without notice.

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