The PRECISION Model FPH Vertical Firetube Hot Water Boiler features the traditional firetube design in the vertical configuration with an underfired power burner. In addition to the simplicity of the 4-piece design, the Model FPH includes many advantages over other vertical configured boilers such as a larger water volume which results in both a low pressure drop thru the unit and reduced cycling, thus improving overall efficiency. The model FPH also features standard “off-the-shelf” burners and the proven firetube reliability.

### Design Advantages
- ISO Certified Quality System
- UL Listing of Complete Assembly
- ASME Pressure Vessel w/National Board Registration
  - Section IV “H” Code (150 psi / 250°F)
  - Section I “S” Code (units > 160 psi / 250°F)
- Standard SA178-A Steel Firetubes
- Turbulators for maximum heat transfer
- 16 Gauge Steel Jacket (square jacket standard)
- High Density Insulation
- High efficiency UL Listed Power Flame power gas, light oil or combination burners
- CSD-1 Compliance (units > 400,000 BTU)
- Heat transfer area sized at approximately 4 sq ft per BHP to obtain up to 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 / Cleanout Openings (2)
- Standard mechanical trim to include:
  - Temperature Control (Off-On)
  - Temperature Limit (Manual Reset)
  - ASME Safety Relief Valve
  - Pressure Gauge with Gauge Cock
  - Temperature Gauge
  - Bottom Blowdown/Drain Valve
  - Manual Reset Probe-type Low Water Cutoff w/ Light

### Standard Features and Accessories
- Wide Choice of Burners
- Motorized Gas Valve(s)
- Low-High-Low or Modulating Control
- FM or IRI Compliance
- Fireye Combustion Control
- Outside Air Intake Adapter
- Side or Rear Flue Connection
- Low Temperature Switch/Alarm
- Low Pressure Switch/Alarm
- Auxiliary Float-type Low Water Cutoff
- Flow Switch (Installed)
- Stainless Steel Construction (210°F max)
- Outdoor Reset Control
- Remote Reset of Setpoint
- Audible Alarm w/Silence PB (High Temp & Low Water)
- Low NOx Burner with or without FGR
- Local/Remote Switch
FPH VERTICAL FIRETUBE WATER BOILER

DIMENSIONAL DATA

HOW TO SELECT A MODEL NUMBER

PHYSICAL DATA

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>NOM BOILER HP</th>
<th>RATED INPUT MBTU</th>
<th>NOM OUTPUT MBTU</th>
<th>VESSEL DIMS (IN.)</th>
<th>WATER VOL (GAL)</th>
<th>OVERALL DIMENSIONS (IN.)</th>
<th>CONNECTION SIZES (NPT)</th>
<th>FLUE SIZE</th>
<th>BURNER BLOWER HP (GAS)</th>
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* Indicates Flanged Connection (150#/3" stick-out)
† 3-Phase
As with all power-fired boilers, the burner is the heart of the unit. PRECISION has chosen as its standard the Power Flame burner for the majority of applications, and either Wayne or Beckett burners as economical choices for low Hp boilers, 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 FPH boiler’s large combustion chamber and generous heat release area have been carefully matched to the burner size to obtain up to 84% efficiency on natural gas, and up to 86% on light oil. The proven Honeywell combustion control system is provided as standard for gas/oil burners, with other systems available as options.

### CONVERSIONS/EQUATIONS

| KW = \( \frac{\text{GPH} \times \Delta T (\text{F})}{410} \) | SATURATED STEAM: PRESSURE vs. TEMPERATURE |
| KW = \( \frac{\text{GPM} \times \Delta T (\text{F})}{416} \) | |
| 10KW = 1.02 BHP = 34 Lbs Steam/H = 34,120 BTU/H | 0 psig = 0 KPa = 212°F |
| GPH = \( \frac{\text{KW} \times 410}{\Delta T (\text{F})} \) | 8 psig = 55 KPa = 235°F |
| GPH = \( \frac{\text{BTU/H}}{8.33 \times \Delta T (\text{F})} \) | 15 psig = 103 KPa = 250°F |
| GPH = \( \text{Amps (3 phase)} = \frac{\text{KW} \times 1000}{\text{Volts} \times 1.732} \) | 30 psig = 207 KPa = 274°F |
| GPH = \( \text{Amps (1 phase)} = \frac{\text{KW} \times 1000}{\text{Volts}} \) | 50 psig = 345 KPa = 298°F |
| BTU/H = \( \frac{\text{KW} \times 3412}{\Delta T \times 500 \times \text{GPM}} \) | 80 psig = 552 KPa = 324°F |
| 1 gal water at 62°F = 8.34 Lbs | 100 psig = 690 KPa = 338°F |
| 1 cu ft water at 62°F = 62.4 Lbs | 125 psig = 862 KPa = 353°F |
| 1 cu ft water at 62°F = 62.4 Lbs | |
| Enthalpy of water = Temp (°F) -32 BTU/LB | 400 psig = 2758 KPa = 448°F |

### BURNER OPTIONS

Off-On control is standard and is quite sufficient for boilers up to 45 Hp. However, boilers rated 50 to 100 Hp may have better operation with either low-high-low burner controls, or a modulating control system.

### CONTACT US FOR THESE QUALITY PRODUCTS

- 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
- Boiler Feedwater Systems
- Pressure Vessels Water Storage Tanks Flash Tanks Blowdown Tanks
- Unfired Hot Water and Steam Generators
- Deaerators and Surge Tanks
- Steam Superheaters-Electric
- Circulation Heaters-Electric
- Gas or Oil-Fired Vertical Firetube Boilers and Water Heaters
- Gas or Oil-Fired WaterTube Boilers (Flextube Type)
- Chemical Bypass Feeder 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.
1. GENERAL
Furnish and install as shown on the plans a PRECISION Vertical Firetube Water Boiler Model FPH________________________ which shall be a complete pretested, packaged unit consisting of a (gas) (oil) power burner with integral vessel, complete with all required operating and safety controls. The Boiler shall include a pressure vessel built to the requirements of ASME Section IV, designed for (125) (150) PSIG, and National Board registered. Units greater than 400,000 BTU shall also comply with CSD-1. A copy of the Manufacturer’s Data Report shall be provided to the owner.

2. RATINGS
Boiler(s) shall each be PRECISION Vertical Firetube Model No. FPH rated_______ BHp. The Boiler(s) shall be designed for_______ GPM with a discharge temperature of_______ ° F. Inlet and Outlet connection sizes shall be _______ " (NPT) (FLG).

3. POWER BURNER (SELECT ONE)
   A. Gas-Fired Burner rated_______ BHp with an input of_______ BTU/H (natural gas) (propane).

   B. Oil-Fired Burner rated ______ BHp with an input of _______ GPH / _______ BTU/H (#1) (#2) fuel oil.

   C. Gas-Oil Combination Burner rated_______ BHP with an input of _______ BTU/H (natural gas) (propane) and GPH (#1) (#2) fuel oil.

Burner shall be designed for _______ V, _______ PH, _______ HZ, electrical supply.

4. CONTROLS AND SAFETY DEVICES
Each Boiler shall be equipped with an ASME pressure 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.

5. 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, 3200 RPM blower 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, 10,000V constant duty ignition, solenoid oil valve(s). Burner to have primary air adjustment (with) (without) optional outside air intake adapter.

6. ENCLOSURE
The pressure vessel shall be insulated with a minimum of 4 inches of 3/4 pound density fiberglass insulation and shall be enclosed in an enameled 16 gauge sheet steel enclosure.

7. MANUFACTURER
Boiler(s) shall be PRECISION Model FPH________________________ or approved equivalent. Alternate bids shall indicate any deviations from these specifications, and shall state price deductions for substitution of said alternates.

**FPH - 11.9.11**