

XP PLUS

The A. O. Smith high efficiency condensing XP^{PLUS} water heater features the latest heat exchanger technology to deliver 98% Thermal Efficiency. The XP^{PLUS} now comes in models with 1.25, 1.50, 2.0, 3.0 and 4.0 million BTU/hr input rates to cover a wide range of heavy duty commercial and industrial applications.

The XP^{PLUS} features an advanced control system with color touchscreen display. The control allows for the optional interface module, for Modbus or BACnet Communication.

The XP^{PLUS} is designed to match with an A. O. Smith storage tank for long life and high performance. Optional custom skid systems are available which provide a factory assembled and tested system specifically for your job.

The XP and XP^{PLUS} family of models now delivers a wide variety of commercial sizes and includes the latest technology to maximize energy efficiency and extended service life.

STAINLESS STEEL CONDENSING HEAT EXCHANGER

- Advanced 316L stainless steel condensing design. This new design heats water at a high 98% thermal efficiency and features a slide out door for improved accessibility and maintenance flexibility.
- Advanced NEG/REG combustion system achieves 5:1 turndown. The gas/air mixture is precisely controlled across the entire turndown range to produce ideal combustion and accurate heat transfer. The turndown ratio matches the heat demand to prevent short cycling or temperature overshoot.

ULTRA LOW NO_x OPERATION

- Complies with SCAQMD Rule 1146.2 (PWH1250-2000) and Rule 1146.1 (PWH3000-4000), and other air quality management districts with similar requirements for low NO_x emissions.

ADVANCED ELECTRONIC CONTROL

- Large touch screen user interface.
- The latest in energy saving algorithms.
- Includes remote tank temperature control to adjust tank temperature at the water heater – modulates the water heater to maintain tank set point temperature within +/-1 degree.
- Water heater output control features 5:1 turndown ratio.

ALL-BRONZE FACTORY SUPPLIED PUMP

- Designed to be wired and controlled by the water heater control.
- Factory-sized for proper flow between water heater and storage tank.
- Allows 50 equivalent feet of piping between water heater and tank.

OPTIONAL OUTDOOR MODEL KITS

- Optional outdoor conversion kits available that include louvers on the side that replace the top air intake. The gas connection is routed through the side of the water heater and the touch screen receives a cover for protection.

DIRECT VENT FLEXIBILITY

- Direct vent up to 150 equivalent feet of pipe. Note: PWH3000 is available up to 100 equivalent feet only.
- Sidewall or vertical.
- Approved for either PVC, CPVC, Polypropylene or AL29-4C stainless steel vent pipe.

FACTORY START-UP INCLUDED

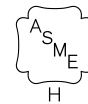
- Required for activating warranty and assuring maximum operating performance. Contact your local sales representative or Authorized Start-Up Agent to arrange a FREE certified start-up.

MEETS THE THERMAL EFFICIENCY REQUIREMENTS OF THE U. S. DEPARTMENT OF ENERGY AND CURRENT EDITION ASHRAE/IES 90.1

98% THERMAL EFFICIENCY (AHRI CERTIFIED)

5-YEAR HEAT EXCHANGER LIMITED WARRANTY

- For complete information, consult written warranty or contact A. O. Smith.



Please note: The XP^{PLUS} water heater models PWH1250-2000 are ANSI Z21.10.3 compliant and ASME certified with "HLW" stamp. Models PWH300-4000 are ANSI Z21.13 compliant and ASME certified with "H" stamp.



Automatic Circulating Water Heaters

OTHER XP^{PLUS} FEATURES:

- 98% thermal efficiency
- Modulating burner with 5:1 turndown
- Direct spark ignition
- Sealed combustion
- Low gas pressure operation
- Vertical and horizontal vent termination
- Category IV venting up to 150 feet
- PVC, CPVC, Polypropylene or AL294C vent material
- ASME stainless steel heat exchanger
- Gasketless design
- 160 psi working pressure
- On/Off switch
- Adjustable high limit with manual reset
- High and low gas pressure switches
- Flow switch
- Inlet and outlet temperature switches
- Temperature and pressure ASME relief valve
- Zero clearance to combustibile material
- Approved for combustibile floor material
- 1 year limited warranty on parts
- 5 year limited warranty (see warranty for details)

STANDARD BRONZE PUMPS

- PWH1250 1 HP, 120V, 1 Phase
- PWH1500 1 HP, 120V, 1 Phase
- PWH2000 2 HP, 208V, 3 Phase
- PWH3000 5 HP, 208V, 3 Phase
- PWH4000 5 HP, 480V, 3 Phase



XP^{PLUS} OPTIONS:

Description	Kit Part Number
Alarm Bell	100301864
LP kit for PWH-1250 & 1500	100307295
LP kit for PWH-2000	100307294
LP kit for PWH-3000	100307293
LP kit for PWH-4000	100307292
Outdoor Conversion kit for PWH-1250	100307291
Outdoor Conversion kit for PWH-1500	100307290
Outdoor Conversion kit for PWH-2000	100307289
Outdoor Conversion kit for PWH-3000	100307288
Outdoor Conversion kit for PWH-4000	100307287
BACnet (MSTP) Field Kit	100301865
Modbus Field Kit	100301866
Contacting Kit	100316001
Condensate Neutralization Kit PWH-1250 - 2000	100112383
Condensate Neutralization Kit PWH-3000 & 4000	100112384

PVC Adapter Kits		
Model	Vent Size	Kit Number
1250	8"	100313222
1500	8"	100313222
2000	8"	100313222
3000	10"	100314853
4000	12"	Field Supplied

Recovery Capacities

Model Number	Btu/Hr Input	Water Flow	Temperature Rise								
			°F	40	60	70	80	90	100	120	140
			°C	22	33	39	44	50	56	67	78
PWH-1250NP	1,250,000	GPH	3,712	2,475	2,121	1,933	1,650	1,485	1,237	1,061	
		LPH	14,051	9,369	8,029	7,317	6,246	5,621	4,683	4,016	
PWH-1500NP	1,500,000	GPH	4,455	2,970	2,545	2,227	1,980	1,782	1,485	1,273	
		LPH	16,864	11,243	9,634	8,430	7,495	6,746	5,621	4,819	
PWH-2000NP	1,999,999	GPH	5,939	3,960	3,394	2,970	2,640	2,376	1,980	1,697	
		LPH	22,482	14,990	12,848	11,243	9,993	8,994	7,495	6,424	
PWH-3000NP	3,000,000	GPH	8,909	5,939	5,091	4,455	3,960	3,564	2,970	2,545	
		LPH	33,724	22,482	19,272	16,864	14,990	13,491	11,243	9,634	
PWH-4000NP	4,000,000	GPH	11,879	7,919	6,788	5,939	5,279	4,752	3,960	3,394	
		LPH	44,967	29,977	25,695	22,482	19,983	17,988	14,990	12,848	

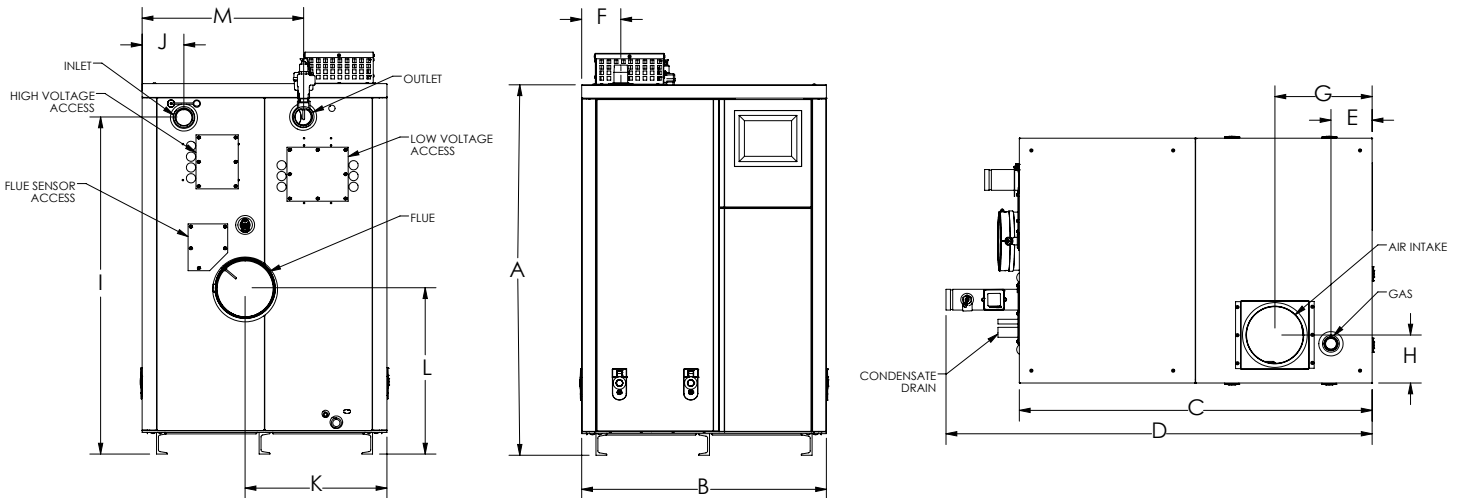
Rough In Dimensions

Dimensions and Specifications								
Model Number	Btu/Hr Input	Thermal Efficiency	GPH 100°F Rise	Gas Conn.	Water Conn.	Air Inlet	Vent Size	Shipping Weight
PWH-1250NP	1,250,000	98%	1,485	1-1/2"	2-1/2"	6" OR 8"	*6" OR 8"	1,519
PWH-1500NP	1,500,000	98%	1,782	1-1/2"	2-1/2"	6" OR 8"	*6" OR 8"	1,672
PWH-2000NP	1,999,999	98%	2,376	1-1/2"	2-1/2"	8"	8"	1,931
PWH-3000NP	3,000,000	98%	3,564	2"	4"	10"	10"	3,147
PWH-4000NP	4,000,000	98%	4,752	2-1/2"	4"	12"	12"	3,694

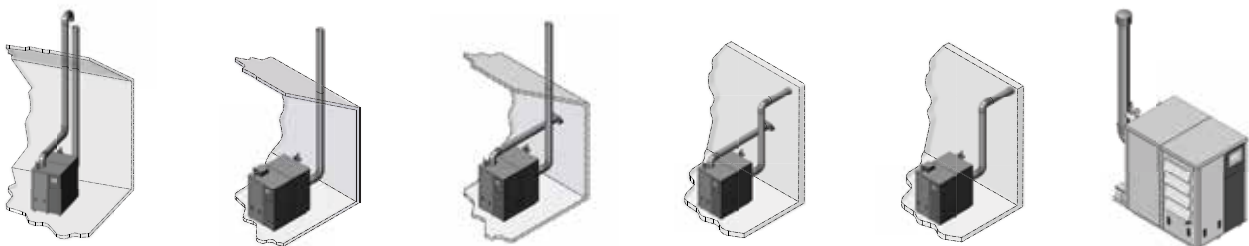
* Use of smaller vent size will result in derating of heater. See venting details in Installation Manual.

Dimensions and Specifications													
Model Number	A	B	C	D	E	F	G	H	I	J	K	L	M
PWH-1250NP	51-1/2"	34"	49"	59"	5-1/2"	5-1/2"	13-1/2"	6-3/4"	46-3/4"	5-3/4"	19-3/4"	23"	22-1/2"
PWH-1500NP	51-1/2"	34"	52-3/4"	62-3/4"	4-1/2"	4-1/2"	13-1/2"	6-3/4"	46-3/4"	5-3/4"	19-3/4"	23"	22-1/2"
PWH-2000NP	51-1/2"	34"	65-1/2"	75-1/2"	7"	5-3/4"	14-3/4"	7-1/4"	46-3/4"	6-3/4"	18-3/4"	23"	23-1/2"
PWH-3000NP	67-1/4"	48-1/4"	79-3/4"	93-3/4"	4-3/4"	6-3/4"	17-3/4"	8-3/4"	60-1/4"	8-1/2"	25-1/2"	29-1/2"	40"
PWH-4000NP	67-1/4"	48-1/4"	96"	110"	5"	7-1/2"	17-3/4"	8-3/4"	60-1/4"	8-1/2"	25-1/2"	29-1/2"	40"

Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.



VERSATILE MULTI-VENTING CONFIGURATIONS



Direct or sidewall vent up to 150 feet with PVC, CPVC, Polypropylene or Stainless Steel. For detailed venting instructions review the XP PLUS water heater instruction manual at www.hotwater.com



Automatic Circulating Water Heaters

Specification Summary

	PWH-1250NP	PWH-1500NP	PWH-2000NP	PWH-3000NP	PWH-4000NP
WATER					
GALLON CAPACITY	11	13	17	25	41
HEATING SURFACE (SQ. FT.)	100.2	119.8	153.2	300.7	402.9
WATER CONNECTIONS ¹	2-1/2"	2-1/2"	2-1/2"	4"	4"
DRAIN	3/4"	3/4"	3/4"	3/4"	3/4"
WATER FLOW RATE (GPM)	112	115	145	270	290
HEAD LOSS (FT. OF HD.)	23	22	27	24	19
MAX. WORKING PRESSURE (PSI)	160	160	160	160	160
MAX. WATER HARDNESS (GRAINS)	15	15	15	15	15
GPH @ 70°F RISE	2121	2545	3394	5091	6788
GPH @ 100°F RISE	1485	1782	2376	3564	4752
GPH @ 140°F RISE	1061	1273	1697	2545	3394
# OF RELIEF VALVES	1	1	1	1	1
RELIEF VALVE SIZE	3/4"	3/4"	1"	2"	2"
RELIEF VALVE RATING (MBH)	1,912,000	1,912,000	2,155,000	6,379,000	6,379,000
RELIEF VALVE PRESSURE RATING (PSI)	150	150	150	150	150
RELIEF VALVE TEMPERATURE RATING (°F)	210	210	210	210	210
GAS					
INLET CONNECTION	1-1/2"	1-1/2"	1-1/2"	2"	2-1/2"
MAX. INLET PRESSURE, NAT	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.
MIN. INLET PRESSURE, NAT	4.0" w.c.	4.0" w.c.	4.0" w.c.	4.0" w.c.	4.0" w.c.
MAX. INLET PRESSURE, LP	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.	14.0" w.c.
MIN. INLET PRESSURE, LP	8.0" w.c.	8.0" w.c.	8.0" w.c.	8.0" w.c.	8.0" w.c.
BTU/HR INPUT	1,250,000	1,500,000	2,000,000	3,000,000	4,000,000
ELECTRICAL					
VOLTAGE & PHASE / HEATER	120V / 1ø	120V / 1ø	208V / 3ø	208V / 3ø	480V / 3ø
AMPS / HEATER	9.9	7.8	1.3	2	2.3
VOLTAGE & PHASE / PUMP	120V / 1ø	120V / 1ø	208V / 3ø	208V / 3ø	480V / 3ø
AMPS / PUMP	11.2	11.2	9.6	13.4	6.1
TOTAL AMPS / HEATER & PUMP	21.1	19	10.9	15.4	8.4
VOLTAGE / CONTROL	24	24	24	24	24
# OF ELECTRICAL CONNECTIONS	1	1	1	1	1
DIMENSIONS					
HEIGHT	51-1/2"	51-1/2"	51-1/2"	67-1/4"	67-1/4"
WIDTH	34"	34"	34"	48-1/4"	48-1/4"
DEPTH	59"	62-3/4"	75-1/2"	93-3/4"	110"
SERVICE CLEARANCES					
FRONT	36"	36"	36"	36"	36"
BACK	24"	24"	24"	24"	24"
RIGHT SIDE	24"	24"	24"	24"	24"
LEFT SIDE	24"	24"	24"	24"	24"
TOP	0"	0"	0"	0"	0"
DIRECT VENTING					
SIZE	6" or 8"	6" or 8"	8"	10"	12"
VENT CATEGORY	IV	IV	IV	IV	IV
VENT MATERIAL (all models)	PVC / CPVC / Polypropylene / Stainless Steel				

¹Victolic grooved connections are required for water connections, and are not included with the unit.



Automatic Circulating Water Heaters

PWH SUGGESTED SPECIFICATION

The gas-fired automatic circulating water heater(s) shall be A. O. Smith XP^{PLUS} model PWH_____ having an input rating of _____ BTU/hr and capable of supplying no less than _____ GPH at a 100°F temperature rise when fired with (Natural/Propane) gas. 1) The water heater shall be capable of full modulation with a turndown ration of 5:1. 2) The water heater shall bear the ASME ("HLW stamp models 1250-2000, "H" stamp models 3000-4000) stamp and shall be National Board registered (CRN in Canada) for 160 PSI working pressure. 3) The water heater(s) shall be equipped with a factory-installed 150# PSIG ASME Pressure Relief Valve. 4) The water heater(s) shall be design-tested and certified to the ANSI Z21.10.3-CSA 4.3 Standards CSA International for models 1250-2000 and ANSI Z21.13 for models 3000-4000. 5) The water heater shall operate up to 98% thermal efficiency at full fire as certified with AHRI. 6) The water heater shall be certified for indoor installation , or outdoor installation with kit, and be approved for installation on combustible floors.

The stainless steel combustion chamber shall be designed to drain condensation to the bottom of the heat exchanger assembly. A built-in trap shall allow condensation to drain from the heat exchanger assembly. The complete heat exchanger assembly shall carry a five (5) year limited warranty.

Water Heater Pump: 1) The automatic circulating water heater(s) shall be supplied with a factory-sized and wired all bronze circulating pump(s). 2) The pump shall be interfaced with and managed by the water heater's control and cycled as needed for most efficient operation.

The burner shall be a premix design and constructed of high temperature stainless steel to provide modulating firing rates. The WATER HEATER shall be supplied with a gas valve designed with negative pressure regulation and be equipped with a variable speed blower system, to precisely control the fuel/air mixture to provide modulating WATER HEATER firing rates for maximum efficiency. The WATER HEATER shall operate in a safe condition at a derated output with gas supply pressures as low as 4 inches of water column.

The WATER HEATER shall utilize a 24 VAC control circuit and components. The control system shall have an electronic display for water heater set-up, water heater status, and water heater diagnostics. All components shall be easily accessed and serviceable from the front of the jacket. The WATER HEATER shall be equipped with; a high limit temperature control certified to UL353, ASME certified pressure relief valve, outlet water temperature sensor, inlet water temperature sensor, a UL 353 certified flue temperature sensor, low water flow protection and built-in freeze protection. The manufacturer shall verify proper operation of the burner, all controls and the heat exchanger by connection to water and venting for a factory fire test prior to shipping.

The WATER HEATER shall have a a Multi-Colored Graphic LCD touch screen display, password security, pump delay with freeze protection, and pump exercise. The WATER HEATER shall feature night setback for the domestic hot water tank and shall be capable of controlling a building recirculation pump while utilizing the night setback schedule for the building recirculation pump. The WATER HEATER shall have the capability to accept a 0-10 VDC input connection for BMS control of modulation or setpoint and enable/disable of the water heater, and a 0-10VDC output of water heater modulation rate. The WATER HEATER shall have a built-in cascading sequencer with modulation logic options of "lead lag" or "efficiency optimized". Both modulation logic options should be capable of rotation while maintaining modulation of up to eight water heaters without utilization of an external controller. Supply voltage for the PWH1250 and PWH2000 WATER HEATER shall be 120 volt / 60 hertz / single phase. Supply voltage for the PWH2000 and PWH3000 WATER HEATER shall be 208 volt / 60 hertz / three phase. Supply voltage for the PWH4000 WATER HEATER shall be 480 volt / 60 hertz / three phase.



Automatic Circulating Water Heaters

PWH SUGGESTED SPECIFICATION

The WATER HEATER shall be installed and vented with a (select one):

- (a) Direct Vent Sidewall system with a horizontal sidewall termination of both the vent and combustion air. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the sidewall with the manufacturers specified vent termination. A separate pipe shall supply combustion air directly to the WATER HEATER from the outside. The air inlet pipe may be PVC, CPVC, ABS, Galvanized, Dryer Vent, Polypropylene or Stainless Steel sealed pipe. The air inlet must terminate on the same sidewall with the manufacturer's specified air inlet cap. The WATER HEATER's total combined air intake length shall not exceed 100 equivalent feet. The WATER HEATER's total combined exhaust venting length shall not exceed 100 equivalent feet. Foam Core pipe is not an approved material for exhaust piping.
- (b) Direct Vent Vertical system with a vertical roof top termination of both the vent and combustion air. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the roof top with the manufacturers specified vent termination. A separate pipe shall supply combustion air directly to the WATER HEATER from the outside. The air inlet pipe may be P PVC, CPVC, ABS, Galvanized, Dryer Vent, Polypropylene or Stainless Steel sealed pipe. The air inlet must terminate on the roof top with the manufacturer's specified air inlet cap. The WATER HEATER's total combined air intake length shall not exceed 150 equivalent feet. The WATER HEATER's total combined exhaust venting length shall not exceed 150 equivalent feet. Foam Core pipe is not an approved material for exhaust piping.
- (c) Sidewall Vent with Room Air system with a horizontal sidewall termination of the vent with the combustion air drawn from the interior of the building. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the sidewall with the manufacturers specified vent termination. The WATER HEATER's total combined exhaust venting length shall not exceed 100 equivalent feet. Foam Core pipe is not an approved material for exhaust piping.
- (d) Vertical Vent with Room Air system with a vertical rooftop termination of the vent with the combustion air drawn from the interior of the building. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the rooftop with the manufacturers specified vent termination. The WATER HEATER's total combined exhaust venting length shall not exceed 150 equivalent feet. Foam Core pipe is not an approved material for exhaust piping.
- (e) Vertical Vent with Sidewall Air system with a vertical rooftop termination of the vent with the combustion air being drawn horizontally from a sidewall. The flue shall be PVC, CPVC, Polypropylene or Stainless Steel sealed vent material terminating at the roof top with the manufacturers specified vent termination. A separate pipe shall supply combustion air directly to the Water Heater from the outside. The air inlet may be PVC, CPVC, ABS, Galvanized, Dryer Vent, Polypropylene or Stainless Steel sealed pipe. The air inlet must terminate on a sidewall using the manufacturers specified air inlet cap. The WATER HEATER's total combined air intake length shall not exceed 150 equivalent feet. The WATER HEATER's total combined exhaust venting length shall not exceed 100 equivalent feet. Foam Core pipe is not an approved material for exhaust piping.

Standards: 1) The water heater shall have an independent laboratory rating for Oxides of Nitrogen (NOx) to meet the requirements of South Coast Air Quality Management District in Southern California and the requirements of Texas Commission on Environmental Quality. 2) The water heater shall built to and meet the ASME – CSD-1 code requirements as factory standard. 3) The water heater shall be compliant with California Code, Factory Mutual, Massachusetts Code and Kentucky Codes and standards.

Factory Start-Up: 1) The water heater manufacturer shall furnish, at no additional charge, the complete certified factory start-up that is required for activating the warranty.