



POWER VT[®]

ISO 9001

CONDENSING GAS-FIRED WATER HEATER

399,000 to 1,000,000 Btu/h
Low NOx available for all inputs



94%
THERMAL
EFFICIENCY
AT FULL
FIRING RATE

WARRANTED
UP TO
10 YEARS
WITH A
NICKELSHIELD[®]
PLATED TANK

DIRECT VENTS
UP TO 500
EQUIVALENT FEET
THROUGH CPVC

3-YEAR SCALE
FAILURE
WARRANTY

ASHRAE 90.1
compliant



Intertek

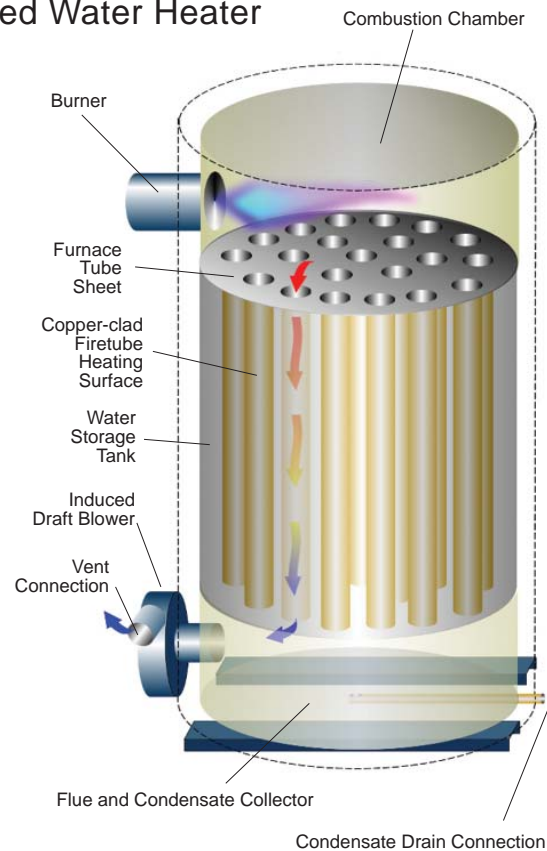
**ULTRA HIGH EFFICIENCY
MADE SIMPLE**

POWER VT®

Condensing Gas-fired Water Heater

POWER VT is a vertical firetube, storage water heater with a down-fired burner. Condensing efficiency of 94% is achieved by adding more heating surface than other water heaters while maintaining the same Btu input. Because of the extra heating surface, flue gases in the water heater are cooled to the point where moisture in the flue gases (H₂O) can no longer remain as vapor and condenses on the heating surfaces inside the water heater. This phase change releases energy through the heating surface into the stored water helping to raise water temperature. The ability to capture the energy created by the vapor-to-liquid phase change (latent heat) results in a thermal efficiency of 94% at full firing rate. This energy is wasted out the flue in other water heaters.

Condensate collects at the base of the unit and is evacuated from the appliance. The water heater utilizes stainless steel components, electroless nickel plating and acid-resistant polymers in areas exposed to condensate.



Condensing vs. Non-condensing

Significant Fuel Savings

At 94% thermal efficiency, POWER VT is one of the most efficient water heaters on the market, consuming 17% less fuel than heaters that comply ASHRAE 90.1 minimum efficiency standards. Even when compared with mid-efficiency systems, POWER VT provides rapid payback.

Water Heater Efficiency	Therms Consumed Annually	Annual Therms Saved with POWER VT	Annual Fuel Savings with POWER VT	Five-year Fuel Savings with POWER VT
POWER VT @ 94%	22,641			
85%	25,039	2398	\$2278	\$11,390
80%	26,604	3963	\$3765	\$18,824

Based on 7,000 gallons per day hot water delivery at 100°F rise.
Natural gas at \$.95 per therm.

Smaller Vent Sizes

With conventional vertical venting, a non-condensing water heater relies on buoyancy (negative pressure) to move hot combustion gases through the vent. This requires larger vent diameters for a given Btu input when compared to POWER VT, which vents under positive pressure.

Less Expensive Vent Material

To ensure that flue gas from a non-condensing heater remains hot enough to naturally rise through the entire vent, air-insulated double-wall material is often recommended. Because flue products exiting POWER VT are cool and the vent is pressurized, less expensive CPVC, is acceptable.

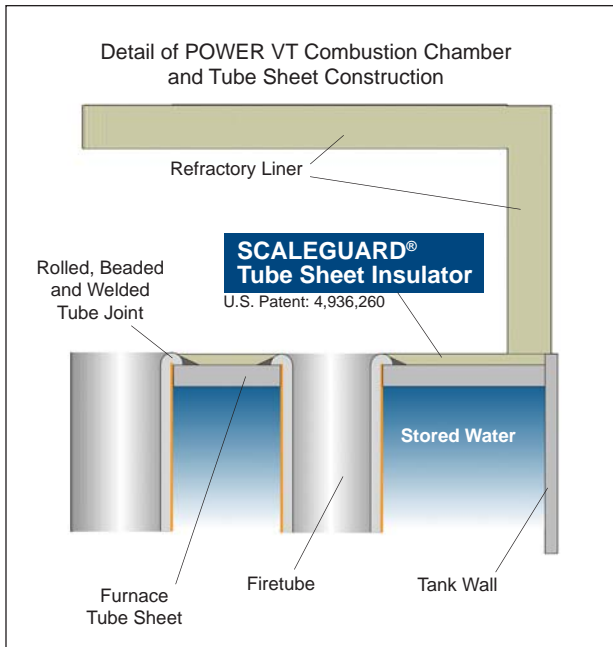
Simplified Vent Design

Non-condensing heaters must adhere to guidelines that dictate flue diameter and the configuration of vertical and horizontal lengths of the flue system. If these guidelines are ignored, heater operation may become unreliable. Occasionally, mechanical room layout may restrict vent design to the point where a motorized power venter is required to exhaust flue products from a non-condensing appliance. POWER VT includes a built in induced-draft fan that produces positive vent pressure sufficient to overcome almost all limits on vent configuration.

Side-wall Venting

POWER VT can vent through a sidewall for up to 500 equivalent feet without assistance from a power venter. Generally, a non-condensing water heater will require power venter assistance in all sidewall-vent applications. Those few non-condensing products that can vent through a sidewall without assistance (category III) are limited to about 50 feet and a longer sidewall vent requires a power venter.

Longevity Assured through Materials and Design



Tube joints and tube sheets

In direct proximity to the heat of combustion, the tube joint and tube sheets experience far more thermal stress than other parts of the water heater. The POWER VT combines design and material to ensure the longevity of this critical component.

The POWER VT tube sheet is constructed similar to an ASME high-pressure steam boiler. The tube sheet is 1/2-inch steel with drilled fire tube openings. The fire tubes are then rolled, beaded and welded into position.

To limit exposure to heat and protect against possible metallurgical failure of the tube sheet, POWER VT is equipped with SCALEGUARD; a patented thermal barrier. By blocking heat, SCALEGUARD reduces the temperature of the tube sheet below the ductile-to-brittle transition temperature. Because the tube sheet is not used as a heat transfer surface, scale buildup on the waterside of the tube sheet will have no heat trapping or damaging effect, nor will it reduce heater efficiency.

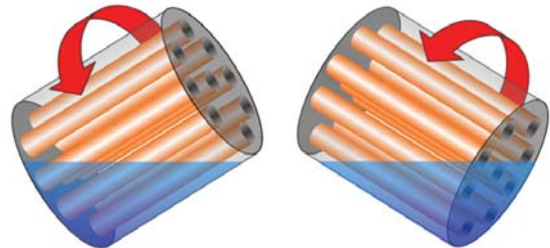
Tank walls

POWER VT is available with either of two corrosion barriers to protect the waterside of the tank.

POLYSHIELD® is the application of several layers of PVDF fluoropolymer. PVDF is known for its chemical stability and is often specified for piping systems carrying highly aggressive water or chemicals. The tanks are lined after all welding is finished and, because lining coverage is complete with no steel exposed, no anode rods are needed to supplement the corrosion protection.

Heating surfaces

Boiler-grade steel tubes are protected on the waterside with dead-soft copper that is fused into a continuous barrier by a homogenizing weld. This design combines the greater thermal strength of steel on the fire side with the corrosion resistance of a non-ferrous metal on the waterside.



Tank is filled with POLYSHIELD and simultaneously rocked and rotated to distribute the material

“ON-OFF” Operation for an “ON-OFF” Application

Most commercial and institutional water heating applications are “on-off” in demand pattern. Highly regimented demand includes dish and laundry machines and applications with scheduled shower loads, such as schools and prisons. Other applications display repeated patterns of heavy periodic use followed by little hot water demand for the rest of the day. Morning and evening shower loads at hotels and dormitories are examples.

During these demand periods, the water heater will be at or near full capacity and require full firing rate. BTU output during “off-demand” periods is small relative to the output during the high demand periods.

Acknowledging that the greatest return on investment would result from using a water heater with the highest efficiency at full firing rate, the POWER VT is designed as an “on-off” water heater with a very high full-rate efficiency. POWER VT also contains a moderate amount of storage, and, during periods of low demand, hot water is drawn from the storage without forcing a minimal firing sequence.

Fuel Savings along with Simplicity, Reliability and Servicability

As a result of “on-off” control, POWER VT avoids the complexity of other condensing water heater designs while offering reduced operating cost. And the temperature and gas train controls in the POWER VT are straightforward, non-proprietary and have a long and successful application history.

NICKELSHIELD® is a layer of electroless nickel; a 90% nickel - 10% phosphorus metallic alloy deposited on the storage tank by chemical plating process. The non-ferrous alloy is nonporous and continuous over the interior and exterior of the vessel. The tanks are plated only after the vessels are fully fabricated and all welding is completed. No anode rods are needed.



Three tanks are removed after timed submersion in the plating bath.

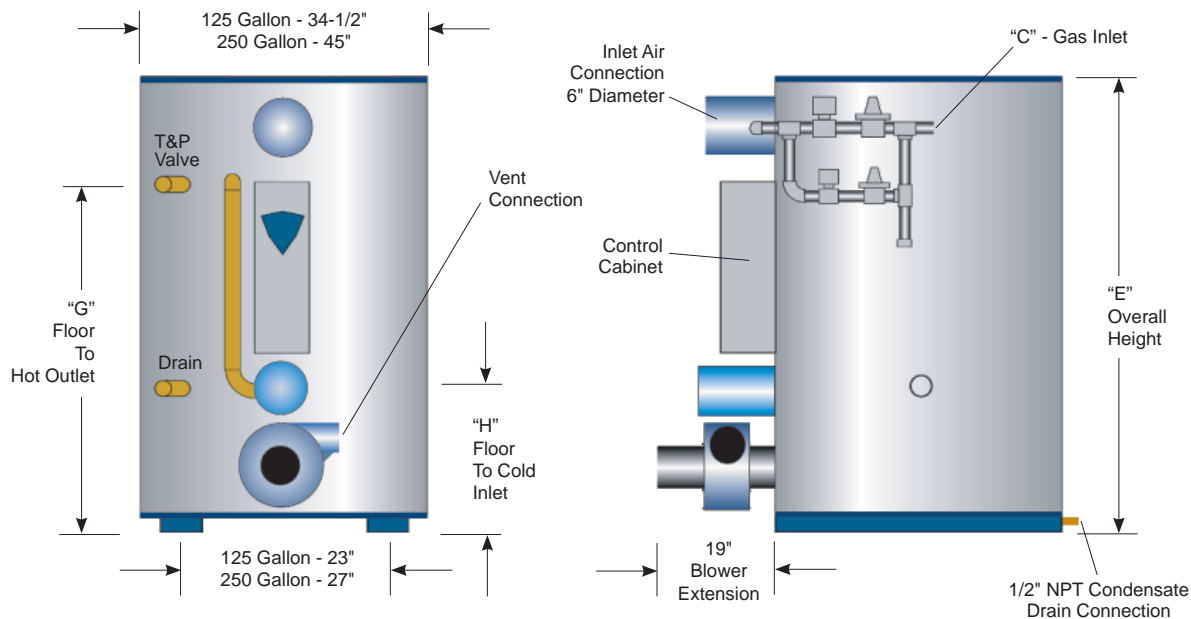
POWER VT[®]

Condensing Gas-fired Water Heater

Specification and Dimensions

Model Number	Input MBH	Approx. Gallons Storage	Recovery Rate (gph)		Approx. First Hour Delivery 40° - 120°F	Dimensions (inches)				Blower Motor hp	Blower Motor amps	Approx. Shipping wt (lbs)
			40° - 120°F	40° - 140°F		E	C	G	H			
560 N 125A-PV	399	125	560	450	650	3/4	79	55	18	1/3	6	1560
800 N 125A-PV	565	125	800	640	880	1	79	55	18	1/3	6	1660
560 N 250A-PV	399	250	560	450	710	3/4	79	55	18	1/3	6	1950
800 N 250A-PV	565	250	800	640	950	1	79	55	18	1/3	6	2090
1060 N 250A-PV	750	250	1060	850	1200	1	81	57	20	1/2	8	2190
1400 N 250A-PV	1000	250	1400	1130	1540	1	81	57	20	3/4	10	2400

Recovery rates are based on a thermal efficiency of 94% per ANSI Z21.10.3.
 Model number shown is for NICKELSHIELD[®]. For POLYSHIELD[®], replace "N" with "P" in model number.
 For low NOx, add "L" to end of model number.



Gas Pressure Requirements

Inlet flow gas pressure must be no lower than 4-1/2" W.C. Static gas pressure at the appliance's gas connection must not exceed 14" W.C.

Venting Requirements

Category IV, positive pressure, condensing. ETL-listed for CPVC plastic vent. AL29-4C is also acceptable. Refer to installation manual.

399 to 750 MBH models:
 Direct inlet air through 6" pipe for 120 equivalent feet.
 Direct exhaust through 4" vent for 100 equivalent feet. Through 6" vent for 500 equivalent feet.

1000 MBH model:
 Direct inlet air through 6" pipe for 120 equivalent feet.
 Direct exhaust through 4" vent for 50 equivalent feet. Through 6" vent for 390 equivalent feet.

Electrical Requirements

Control Voltage: 120V, 1Ø, 60Hz., 2 amps
 Induced Draft Blower: 120V, 1Ø, 60Hz.
 See chart for hp and amps.
 Intra-tank Circulator: 120V, 1Ø, 60Hz.
 1/3 hp, 8 amps
 (Circulator operates only when burner is firing.)

This product is protected by patents in the U.S., Canada and Mexico.

PVI reserves the right to change the design and specification without notice.

For the most up-to-date submittal information, please visit www.pvi.com.



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