

A.O. SMITH

Energy Saving Product

Exceeds the minimum requirements of ASHRAE/IES 90.1-1999 for thermal efficiency and standby loss.

FEATURES

94% THERMAL EFFICIENCY - Fully condensing design is 16% more efficient than the ASHRAE requirement of 80%.

FLEXIBLE VENTING – 3" or 4" PVC, ABS or CPVC pipe is recommended. The CYCLONE XHE™ vents vertically, horizontally and is also approved for direct vent sealed combustion applications. 50 equivalent feet maximum using 3" vent, 120 equivalent feet using 4" vent.

ADVANCED ELECTRONIC CONTROLS – A microprocessor controls the ignition and thermostat allowing precise setting of water temperatures from 110°F to 180°F. A digital display panel shows the operating mode, all user settings and any failure modes for ease of service.

PRESET POWER BURNER – Developed for the CYCLONE XHE™, a turbulent jet flame shoots down the submerged combustion chamber in a spiral action. This turbulence causes a thorough mixing of the gas and air for optimum combustion and high heat transfer efficiencies.

SUBMERGED COMBUSTION CHAMBER – Submerging the combustion chamber in the center of the water storage tank minimizes radiant heat loss and improves efficiency.

ZERO INCH CLEARANCE – The CYCLONE XHE™ jacket is cool and is approved for zero inches to combustibles for unsurpassed installation flexibility.

SPIRAL WOUND FLUE TUBE – The continuous spiral flue tube keeps the hot combustion gases moving at a high velocity. The combination of high turbulence and velocity causes an enormous rate of heat transfer into the water.

SCALE FREE – This flue design prevents scale and sediment from forming on the flue tube and reducing efficiency over time.

GLASS LINED TANK – Proprietary ceramic coating developed by A.O. Smith's ceramic engineers specifically for this heater is applied after the complete tank has been assembled to give a seamless barrier against corrosion by hot water. The maximum working pressure is 160 psi.

HANDHOLE CLEANOUT – Allows easy inspection and cleaning of the tank.

FOAM INSULATION – Thick foam insulation protected by a heavy gauge steel jacket contributes to low standby losses.

EASY INSTALLATION – All components are factory assembled and 100% tested prior to shipment. Only gas, water, electrical and venting connections need to be made. No major field adjustments are required for proper operation. Includes T&P valve and drain valve.

CYCLONE^{XHE™}

94% EXTRA HIGH EFFICIENCY
TANK-TYPE WATER HEATERS

BTH-120, BTH-150, BTH-199 & BTH-250



SCAQMD Approved, Rule 1146.2 Low NOx for California and Texas.



ASME
(OPTIONAL)



LIMITED WARRANTY OUTLINE

If the tank assembly which includes the combustion chamber and flue should leak any time during the first three years, under the terms of the warranty, A.O. Smith will furnish a replacement tank assembly. Installation, labor, handling and local delivery are extra. **THIS OUTLINE IS NOT A WARRANTY.** For complete information, consult the written warranty or A.O. Smith Water Products Company.

Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.

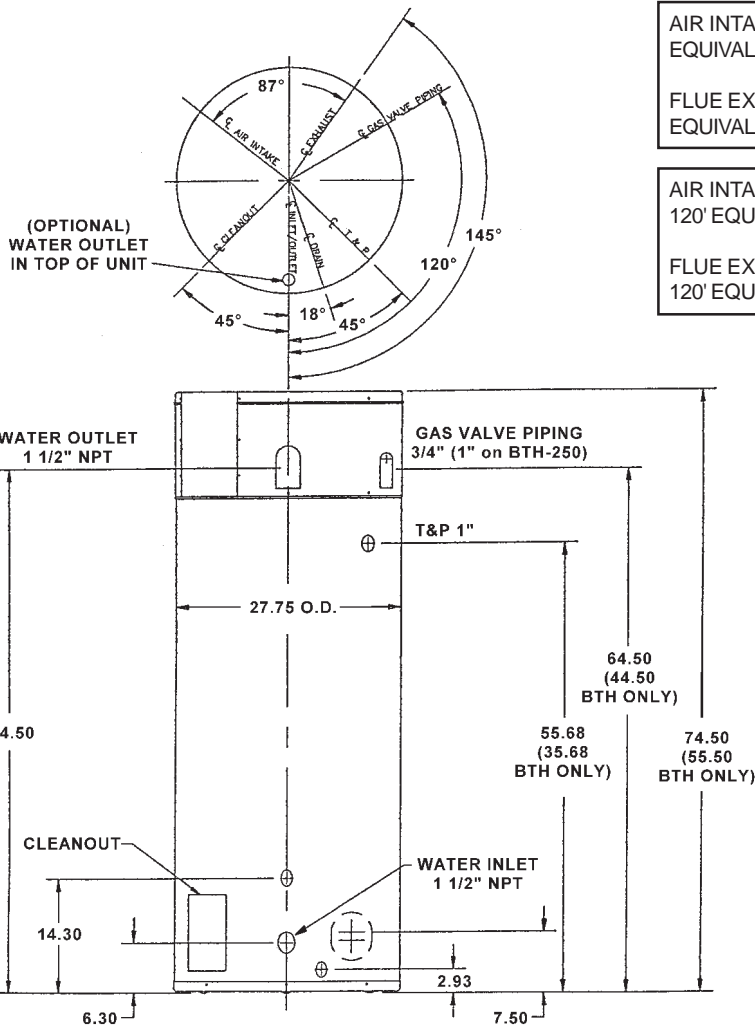
PATENTS PENDING

ROUGH IN DIMENSIONS

INSTALLATION CLEARANCES

Sides	0"
Front	4"
Rear	0"
Top	2"

Combustible clearances 0".
Approved for combustible floors.



AIR INTAKE 3" PVC, CPVC, ABS, 50' EQUIVALENT MAXIMUM.
FLUE EXHAUST 3" PVC, CPVC, ABS, 50' EQUIVALENT MAXIMUM.

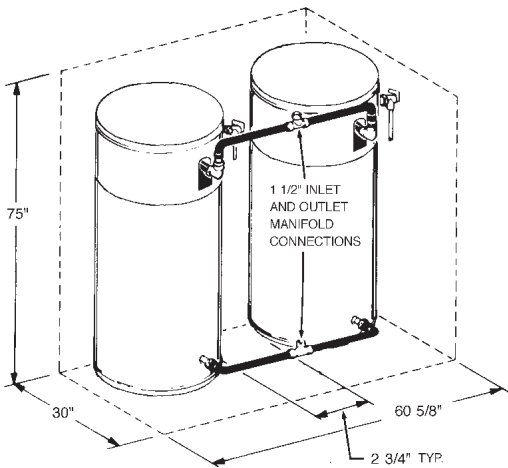
AIR INTAKE 4" PVC, CPVC, ABS, 120' EQUIVALENT MAXIMUM.
FLUE EXHAUST 4" PVC, CPVC, ABS, 120' EQUIVALENT MAXIMUM.

RECOVERY CAPACITIES

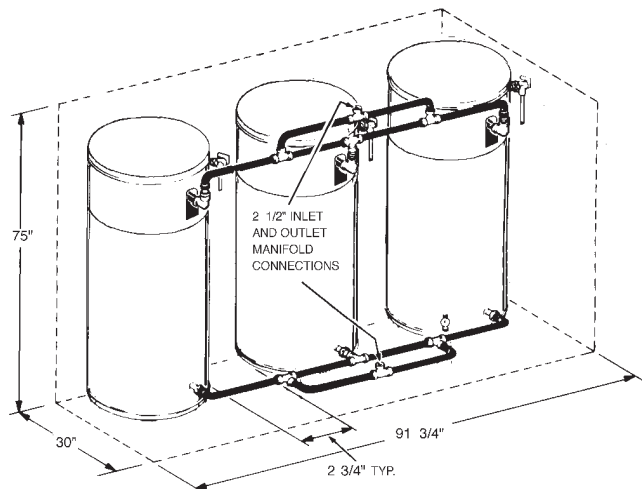
Model	BTU Input	Approx. Gallon Capacity	Ship. Wt.	Temperature Rise - Degrees F - Gallons per Hour											
				30	40	50	60	70	80	90	100	110	120	130	140
BTH-120	125,000	60	350	475	356	285	237	203	178	158	142	129	119	110	102
BTH-150	150,000	100	438	570	427	342	285	244	214	190	171	155	142	131	122
BTH-199	199,000	100	438	756	567	453	378	324	283	252	227	206	189	174	162
BTH-250	240,000*	100	438	912	684	547	456	391	342	304	273	249	228	210	195

*BTH-250 NOT AVAILABLE IN LP GAS.

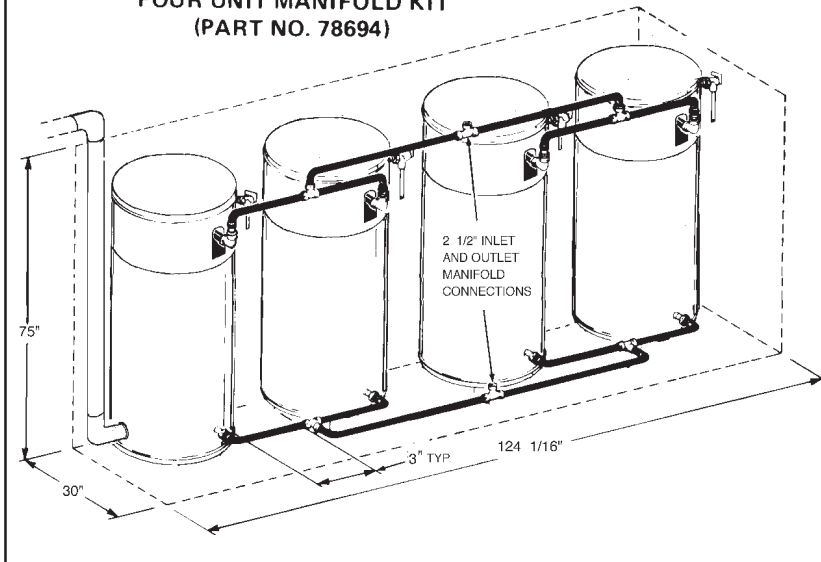
TWO UNIT MANIFOLD KIT (PART NO. 78692)



THREE UNIT MANIFOLD KIT (PART NO. 78693)



**FOUR UNIT MANIFOLD KIT
(PART NO. 78694)**



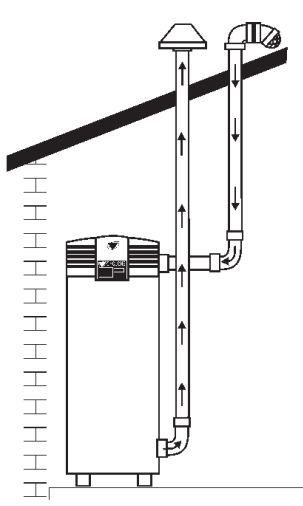
1. Direct Vent/Sealed Combustion

The ultimate venting system for either horizontal or vertical applications.

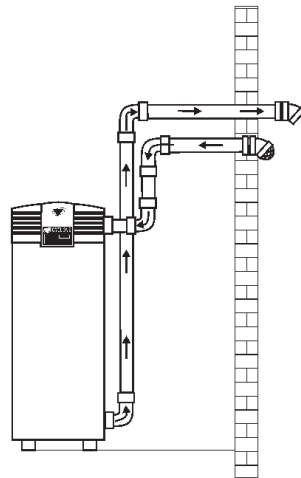
This system gives the specifier and installer optimum venting flexibility in placing the Cyclone XHE at point of use. The safe, two-vent, system allows clean uncontaminated air to be drawn directly into the unit. The flue gas products are expelled directly through the wall to the outside. This two-vent system protects the unit from harmful flue products being recirculated.

2. Sidewall or Vertical

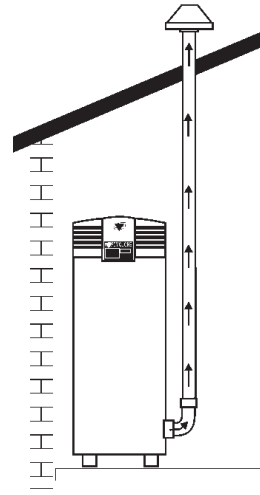
The Cyclone XHE series can be vented directly through an outside wall or vertically up through the roof. Quick and simple. Perfect for retrofit and cost saving installations.



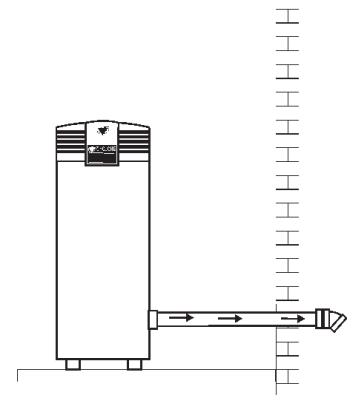
**SEALED DIRECT VENT
VERTICAL
50' INTAKE, 50' EXHAUST**



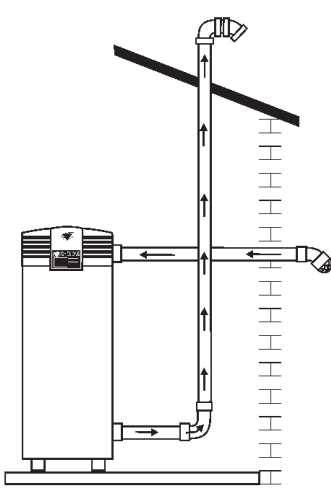
**SEALED DIRECT VENT
SIDEWALL
50' INTAKE, 50' EXHAUST**



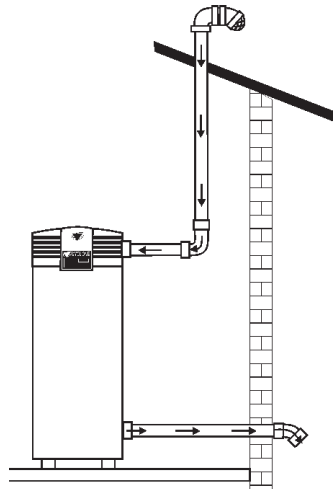
**INDOOR CONVENTIONAL
VERTICAL
50' EXHAUST**



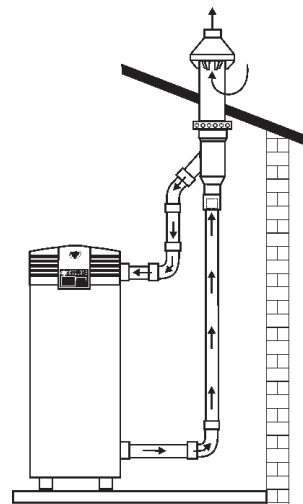
**INDOOR CONVENTIONAL
SIDEWALL
50' EXHAUST**



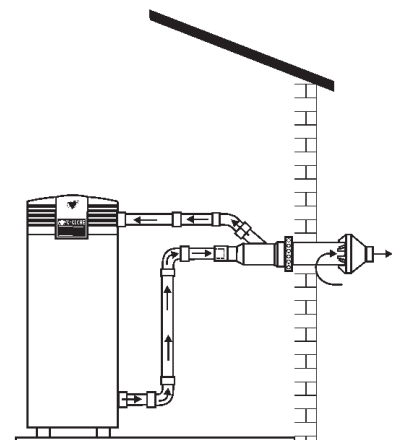
**SEALED DIRECT VENT
HORIZONTAL INTAKE
VERTICAL EXHAUST**



**SEALED DIRECT VENT
VERTICAL INTAKE
HORIZONTAL EXHAUST**



**SEALED DIRECT VENT
w/CONCENTRIC VENT
VERTICAL TERMINATION**



**SEALED DIRECT VENT
w/CONCENTRIC VENT
HORIZONTAL TERMINATION**

SPECIAL CONSTRUCTION FEATURES

All functional controls are located at the top of the heater for ease of service and protection from water damage in equipment rooms that have potential for flooding. The top cover comes off quickly to provide convenient access for all serviceable parts.

This is a fully condensing water heater. The latent heat energy which holds water in the vapor state in the combustion process is effectively scavenged. This means that water which would normally escape up the flue as vapor in a conventional heater is condensed into its liquid state prior to exiting the heater. The spiral flue tube coils downward to permit natural drainage of the condensate. As a result the flue exits at the bottom of the heater. The heater should be located near a drain to enable the condensate to be properly disposed of.

The exhaust gases of this heater are less than 140 degrees F, much lower than a standard water heater. In cold climates any water vapor remaining in the flue gases will condense into a cloud of vapor at the point where the vent system exits the building. This vapor can discolor exterior building surfaces over a period of time. The flue exhaust should be located in an area where the water vapor cloud or potential discoloration of the walls is not a concern. Locating the vent termination out from the wall by six or more inches helps prevent the vapor from being trapped in the layer of air that sometimes forms along a buildings face. The vent can also be terminated on the roof to avoid any problems. Always keep the vent above the maximum snow line so it cannot get covered up. Do not locate the exhaust above a walkway.

Avoid locating the air intake too close to the exhaust of this unit or any other exhaust terminations that discharge moisture laden air such as clothes dryers, in very cold climates. The intake can freeze over if the moisture is drawn through the screen required to prevent foreign objects from getting sucked into the fan. A separation of three feet is usually adequate to prevent intake freezing. Locate the intake above the maximum snow line also. The heater is equipped with sensors to shut it down if any blockage of the vent or intake occurs. A light on the diagnostic panel will alert the maintenance people to the problem.

Avoid locating the exhaust terminals close to bedroom windows or areas where blower noise will be objectionable. Venting into corners or confined areas will amplify the sound. Anchoring the intake or exhaust to walls or ceilings can cause noise to be transmitted to living areas. Where this must be done - use isolation mounts. Consult us if you have any questions.

SUGGESTED SPECIFICATIONS

Water Heater(s) shall be model BTH-_____ as manufactured by A.O. Smith. Water heater(s) shall be of the seamless glass lined steel tank construction in which the glass coating is applied to the water side surfaces of the tank after the tank has been assembled and welded. The condensing flue coil shall be coated on the flue gas side with A.O. Smith's proprietary acid resistant glass lining designed for use in condensing heaters.

The heater(s) shall be suitable for venting with (3" or 4")_____ diameter PVC pipe for a total equivalent distance of (50' or 120')_____ feet. [*alternative venting*: the heater shall be suitable for sealed combustion direct venting using a (3" or 4")_____ diameter PVC air intake pipe and (3" or 4")_____ diameter PVC exhaust pipe for a total distance of (50' or 120')_____ equivalent feet of vent and (50' or 120')_____ equivalent feet of intake.] The heater shall be factory assembled and tested. The power burner shall be of a design that requires no special calibrations on start up. The heater(s) shall be approved for 0" clearances to combustibles.

The control shall be an integrated solid state temperature and ignition control device with integral diagnostics, LED fault display capability and a digital display of temperature settings.

The tanks shall be foam insulated and equipped with a ASME rated temperature pressure relief valve. The water heater shall be UL listed and exceed the minimum efficiency requirements of ASHRAE/IES 90.1-1999.

This heater shall be listed by SCAQMD Rule 1146.2 Low NOx.

Operation of the heater in a closed system where thermal expansion has not been compensated for with a properly sized thermal expansion tank will void the warranty.

A.O. Smith Water Products Co., Inc. On Line
www.aosmithwaterheaters.com

For Technical Information and
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Phone: 800-527-1953

A. O. Smith
Water Products Company
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A Division of A. O. Smith Corporation

A. O. Smith Corporation reserves the right to make product changes
or improvements at any time without notice.