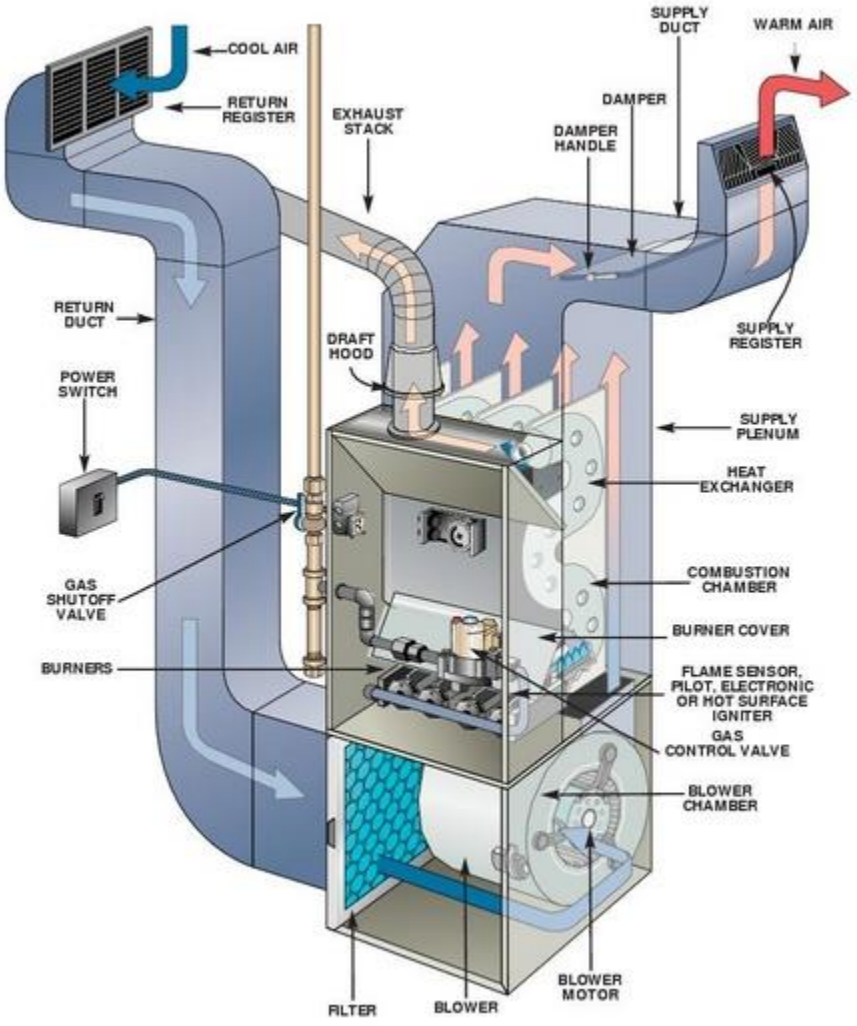
WELCOME

Condensing vs. Non-Condensing Gas Appliances

Gas Non-Condensing Furnace

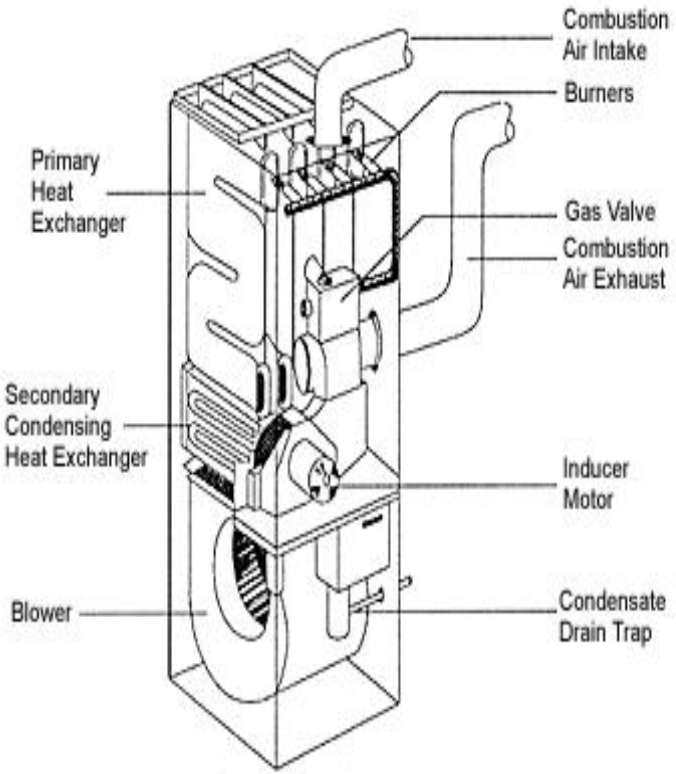


- Burners are ignited
- Blower motor is turned on
- Cool or return air enters, is filtered and blown through furnace heat exchanger
- Heat from the combustion chamber goes through the heat exchanger
- Air absorbs heat and is passed out through supply duct
- Exhaust gasses are vented out through type B vent to roof

Non-Condensing Furnace Installation

- Requires type B metal vent up to and through the roof
- Requires indoor combustion air
- Should have minimal professional maintenance
- Minimum 80% efficient

Gas Condensing Furnace



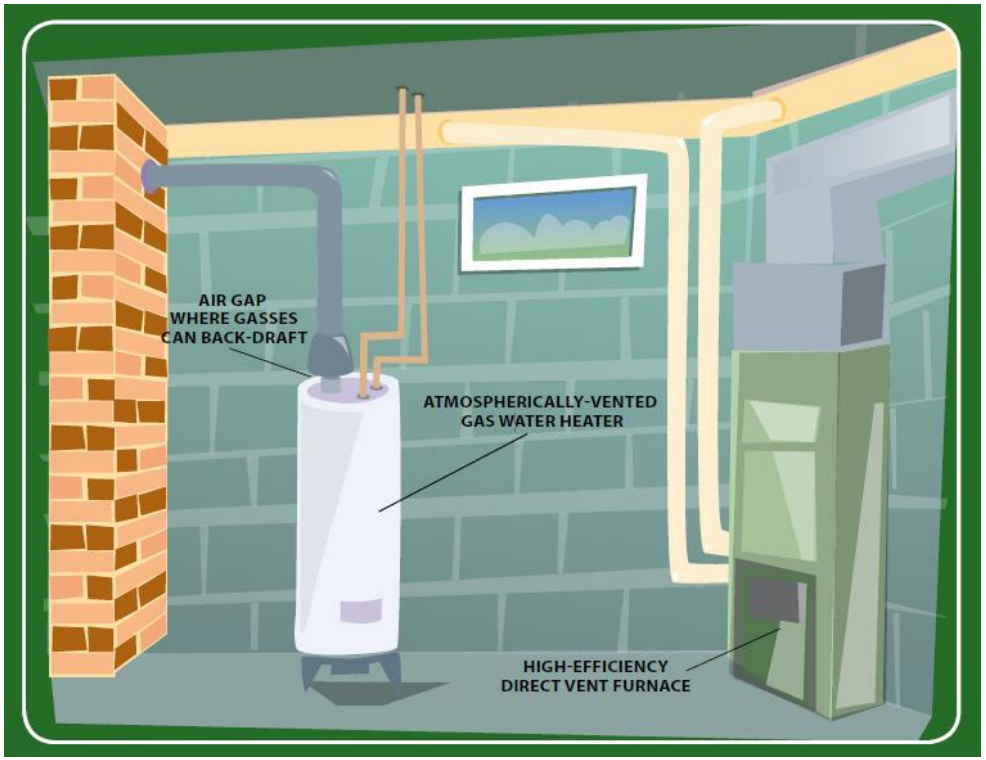
High Efficiency Condensing Furnace

- Second heat exchanger used to heat the air from condensed exhaust gasses

- Less expensive venting (Usually PVC) *on new construction*

Condensing Furnace Installation

- Requires PVC venting
- Will not connect to existing venting when replacing existing furnace
- Most models are direct vent (does not require indoor combustion air)
- Can require annual professional maintenance
- Minimum 90% efficient



Orphaned Water Heater

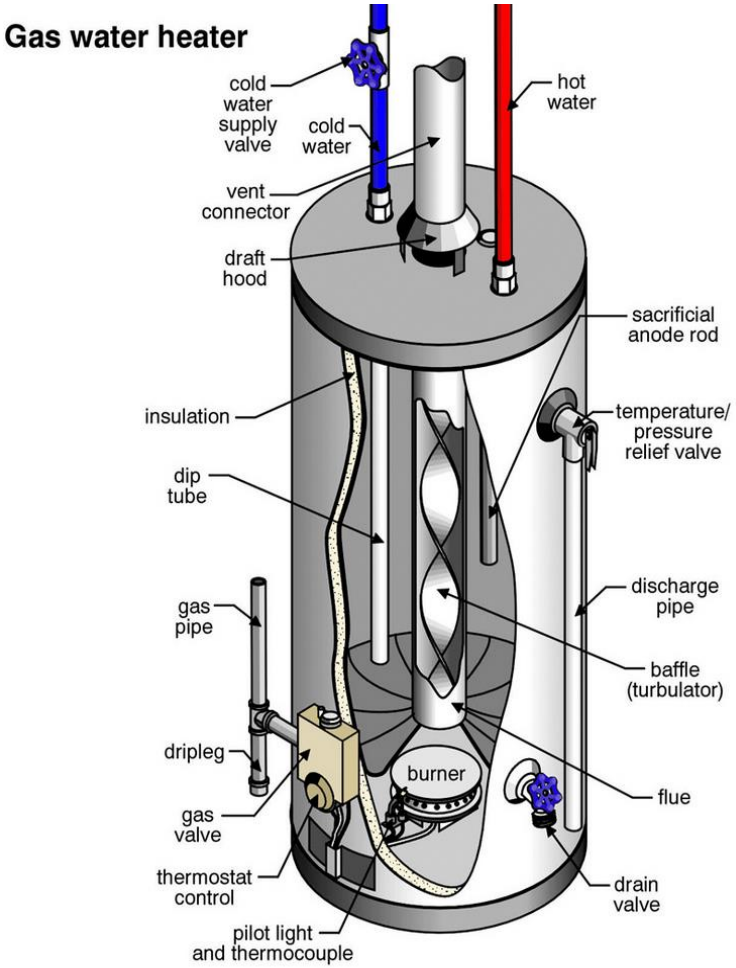
- Many homes utilize a combination venting system through a chimney where the WH & Furnace share a vent.
- In existing homes where an older non-condensing Furnace is replaced by a 90+ efficiency appliance, an “Orphaned Water Heater” can occur.
- When the new condensing furnace is vented directly outside, the remaining vent for the WH is drastically oversized and serious CO concerns may arise.
- Methods to address this problem can be a major financial constraint.

Orphaned Water Heater

Connected to oversized flue

Liner installed through flue

Gas Non-Condensing Water Heaters



- Cold water enters through the inlet and is released at the bottom
- The gas burner heats the water
- Warm water rises and exits through the outlet pipe
- Exhaust from burner exits through a baffled flue and is vented outside (type B vent)

Standard Storage-Type Water Heater Installation

- Requires 6” of clearance for type B ventilation
- 4 - 6 sq ft ground space
- Requires indoor combustion air
- Seamless installation when replacing existing water heater (reconnect to existing structures)
- Should be flushed by homeowner annually
- Requires very little other maintenance

Gas Condensing Water Heater

- Hot exhaust gases are captured and utilized to heat the water in addition to main burner
- Less expensive venting in *new construction*
- Cannot connect to existing venting when replacing old WH
- More Efficient
- Low NOx (Nitrogen Oxides) Emission

Condensing Water Heater Installation

- Requires PVC venting, no clearance to combustibles (some models may be direct vent)
- 4 - 6 sq ft ground space
- Requires new venting when replacing existing water heater
- May not require indoor combustion air
- Annual professional maintenance recommended

MID-EFFICIENCY VS. HIGH-EFFICIENCY

AFUE (Annual Fuel Utilization Efficiency)	VENTING	BASIC OPERATION ENHANCEMENTS	PROS	CONS
80-83 Mid Efficiency	• Traditional metallic piping and/or chimney liner • Utilize existing venting on remodel/upgrade • Fan-assisted draft • Should be through roof	• Electronic Ignition • Fan induced Draft • Small Diameter Flue • Several fan/burner controls	• Retrofits are simple • Less expensive • Less maintenance • Proven/familiar designs	• Cannot be direct vent • Consume more fuel • Produce more byproducts
90+ High Efficiency	• Must be vented according to manufacturer's instructions. • Most likely require PVC • Can be direct-vent or fan-assisted draft • Can be through wall	• Sealed Combustion chamber • Utilize second heat exchanger to extract heat from flue gas • Lower temp flue gas • Condensing • Many fan/burner controls	• Consume less fuel • Produce less unwanted byproducts • Easier install on new construction	• More expensive • More maintenance • Newer designs not as well proven • More parts to break • Condensate disposal • Retrofits are complex • Orphaned WH

THANK YOU