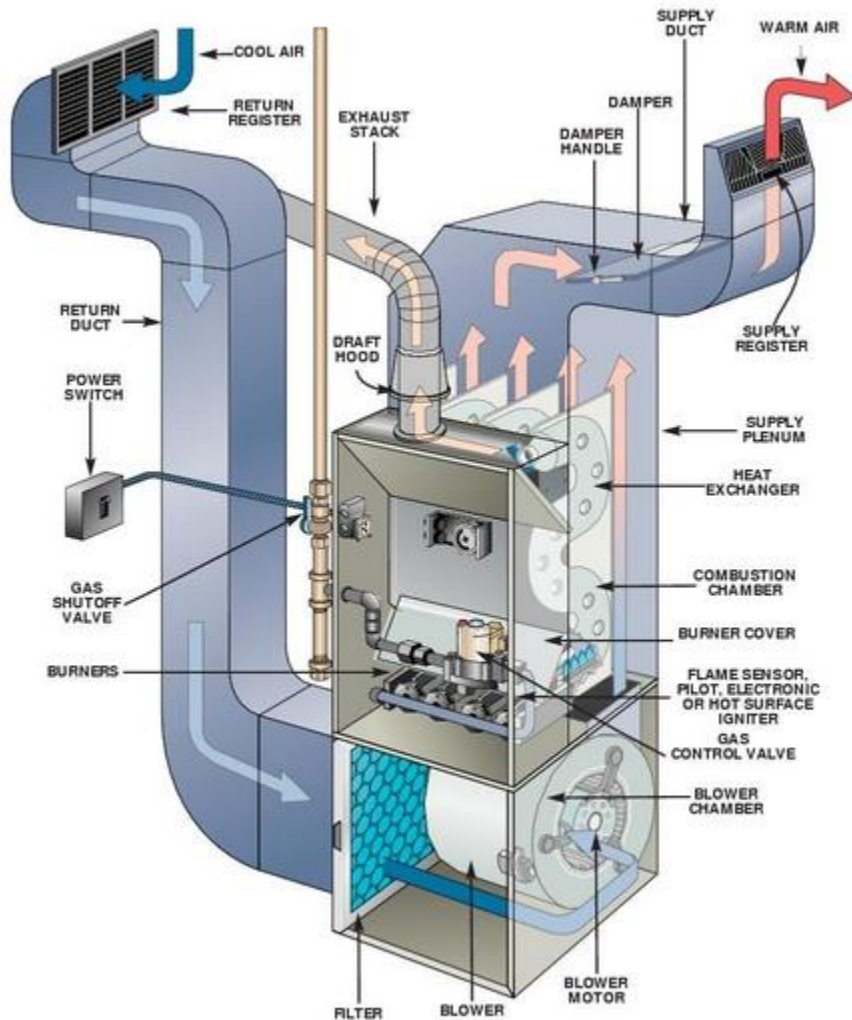


**WELCOME**

# Condensing vs. Non-Condensing Gas Appliances

# Gas Non-Condensing Furnace

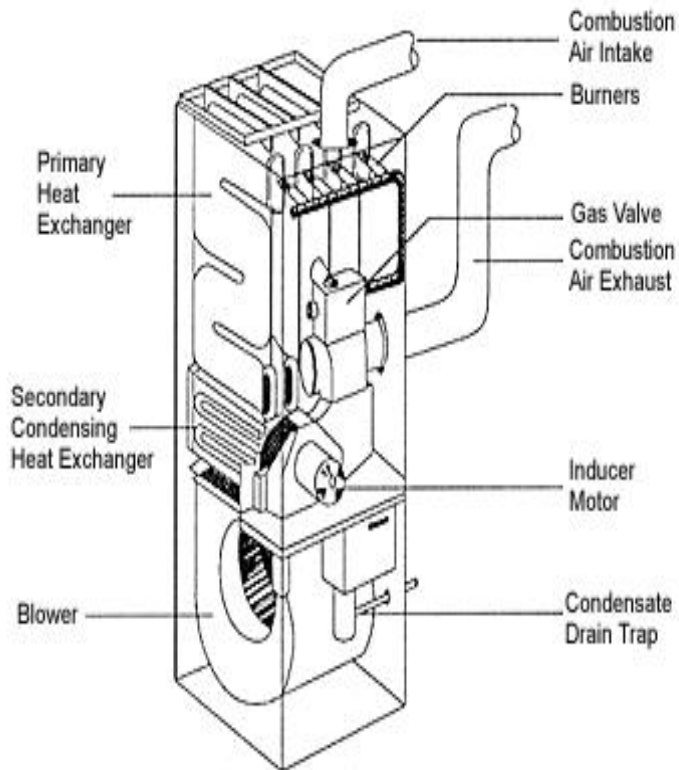


- Burners are ignited
- Blower motor is turned on
- Cool or return air enters, is filtered and blown through furnace heat exchanger
- Heat from the combustion chamber goes through the heat exchanger
- Air absorbs heat and is passed out through supply duct
- Exhaust gasses are vented out through type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



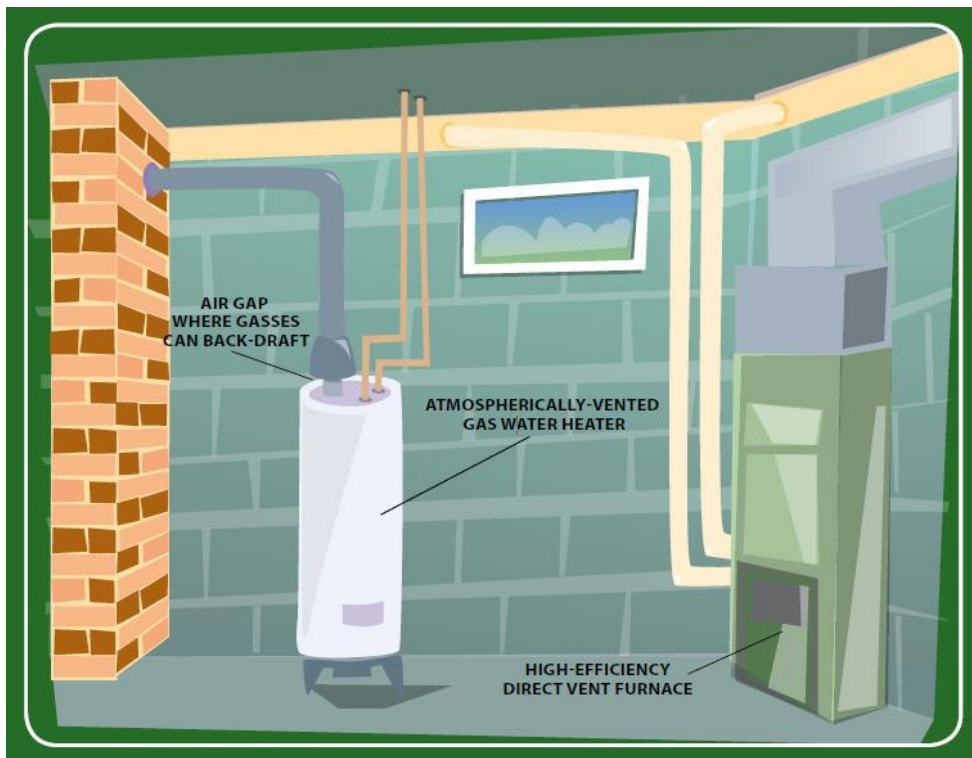
***High Efficiency Condensing Furnace***

- 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

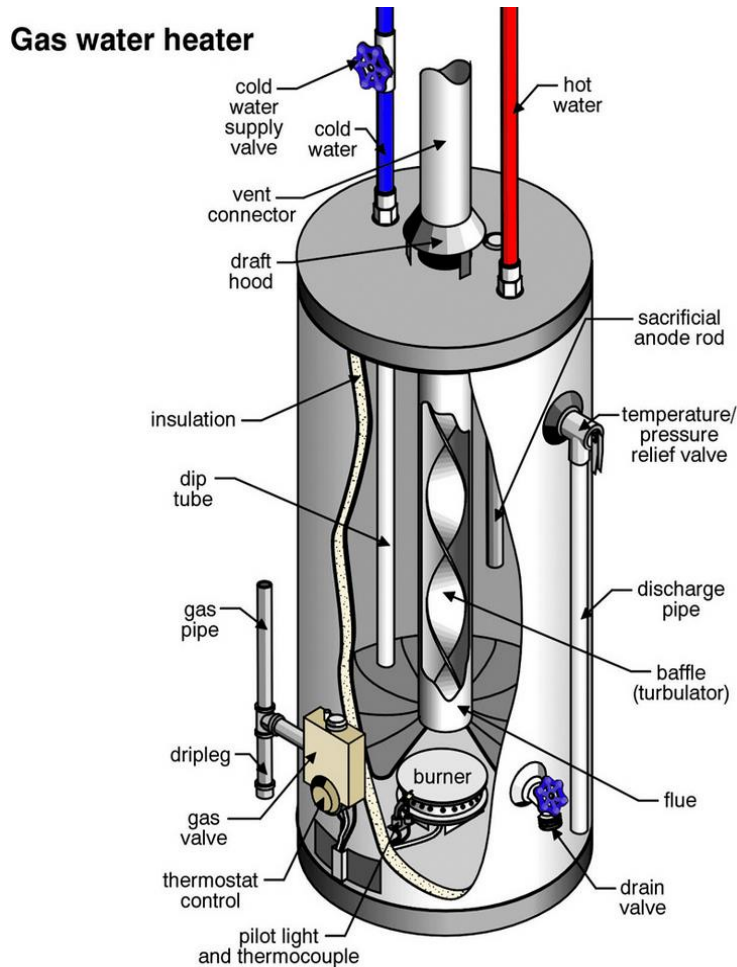
**Connected to oversized flue**

**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 NO<sub>x</sub> (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

<b>AFUE</b> (Annual Fuel Utilization Efficiency)	<b>VENTING</b>	<b>BASIC OPERATION ENHANCEMENTS</b>	<b>PROS</b>	<b>CONS</b>
<b>80-83</b>  <b>Mid Efficiency</b>	<ul style="list-style-type: none"> <li>• Traditional metallic piping and/or chimney liner</li> <li>• Utilize existing venting on remodel/upgrade</li> <li>• Fan-assisted draft</li> <li>• Should be through roof</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic Ignition</li> <li>• Fan induced Draft</li> <li>• Small Diameter Flue</li> <li>• Several fan/burner controls</li> </ul>	<ul style="list-style-type: none"> <li>• Retrofits are simple</li> <li>• Less expensive</li> <li>• Less maintenance</li> <li>• Proven/familiar designs</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot be direct vent</li> <li>• Consume more fuel</li> <li>• Produce more byproducts</li> </ul>
<b>90+</b>  <b>High Efficiency</b>	<ul style="list-style-type: none"> <li>• Must be vented according to manufacturer's instructions.</li> <li>• Most likely require PVC</li> <li>• Can be direct-vent or fan-assisted draft</li> <li>• Can be through wall</li> </ul>	<ul style="list-style-type: none"> <li>• Sealed Combustion chamber</li> <li>• Utilize second heat exchanger to extract heat from flue gas</li> <li>• Lower temp flue gas</li> <li>• Condensing</li> <li>• Many fan/burner controls</li> </ul>	<ul style="list-style-type: none"> <li>• Consume less fuel</li> <li>• Produce less unwanted byproducts</li> <li>• Easier install on new construction</li> </ul>	<ul style="list-style-type: none"> <li>• More expensive</li> <li>• More maintenance</li> <li>• Newer designs not as well proven</li> <li>• More parts to break</li> <li>• Condensate disposal</li> <li>• Retrofits are complex</li> <li>• Orphaned WH</li> </ul>

**THANK  
YOU**