
GLOSSARY OF TERMS

A.F.U.E. - Annual Fuel Usage Efficiency. Ratio of annual output of useful energy or heat to annual energy input to heater. Only heat leaving as hot water deemed usable and calculated as part of space heating efficiency.

A.S.M.E. - American Society of Mechanical Engineers

BAROMETER - Device for measuring atmospheric pressure

BAFFLE - Object placed in appliance to change direction of or retard flow of air, gas or mixtures of flue gases

BTU - British Thermal Unit. Energy required to heat one pound of water from 59°F to 60°F. .000293 KWh = 1 BTU

BTU CONTENT

1 gallon Fuel Oil	=	140,000 BTUs
1 gallon Propane	=	91,800 BTUs
1 lb. Propane	=	21,650 BTUs
1 gallon Butane	=	102,400 BTUs
1 lb. Butane	=	21,500 BTUs
1 Kilowatt Hour (KWh)	=	3,413 BTUs

CALORIE - Energy required to heat 1 kg of water through 1 degree Celsius (3.968 BTUs)

CENTRAL SYSTEM HEATING - Unit that produces heat from a centralized location and distributes it throughout the structure.

CIRCULATING WATER HEATER -

1. **Automatic** - Furnishes hot water to be stored in separate vessel. Storage tank temperatures controlled by thermostat installed on heater. Circulation either natural or forced.

2. **Non-automatic** - Same as above except thermostat installed in storage vessel.

CIRCULATING TANK SYSTEM - Water heater is connected to separate storage tank, allowing large amounts of hot water to be built up for use during short periods of peak demand. Recovery to storage ratio: 1 GPH recovery to 1 gallon stored.

COIL CIRCULATION - Water heater with heat transfer surface composed primarily of water tubes less than 1 1/2" in internal diameter and requiring circulation.

COLD INLET TEMPERATURE - Temperature of outside water coming into water heating system; typically 40°F during cold months in U.S.

COMBUSTION EFFICIENCY - Measures only heat lost up stack. Does not account for heat lost through jacket, combustion chamber or heat leaks (drain valves, T&P valves).

COMMERCIAL STORAGE - Water heater with input rate of more than 75,000 BTUs per hour.

CONDENSATE - Water vapor.

CONDUCTION - Heat transfer across surface, or transfer of heat through a material by passing from one molecule to another.

CONFIGURATION - Direction in which furnace outputs heat; upflow, downflow or crossflow (horizontal).

CONVECTION - Heat transfer due to flow or movement. Heat transfer by actual movement of heated liquid or gas between regions of unequal density.

DELIVERY - Amount of hot water that heater can supply during first hour of use. Delivery = Recovery + 80% of storage.

DIRECT VENT - System with indoor water heater, combustion air connections between heater and outside atmosphere, flue gas connections between heater and vent cap, vent cap for outdoors so all air for combustion is obtained from outside atmosphere and all flue gases are discharged to outside.

DUCTWORK - System through which warm air from central furnace is delivered.

ELECTRODE - Conductor that transfers electric charges into or out of another conducting medium, or that influences the flow of current in another conducting medium.

ENERGY FACTOR - Measure of overall efficiency of heater based on model's recovery efficiency, standby loss and energy inputs.

FORCED AIR - Air delivery system that moves heated air mechanically using fans and blowers.

FUEL OIL - Petroleum products used as fuels.

#1 - distillate oil for vaporizing-type burners

#2 - distillate oil for general purpose burners

#4 - blended oil for use without preheating

#5 - blended oil for use with preheating

#6 - residual oil for use in burners with preheaters using high viscosity fuel

FLOW CONTROL VALVE - Devices installed between supply pipe and plumbing fixture (shower head, faucet, etc.) to reduce flow of water to constant level. Recommended for large shower installations; can reduce water flow in half without disturbing spray pattern for water and energy savings.

FLOW RATE - Amount of water in gallons flowing in plumbing fixture or pipe during period of time (typically, minutes). Measured in GPM (gallons per minute).

GPH/GPM - Gallons Per Hour/Gallons Per Minute. Amount of water flowing through plumbing fixture or pipe per hour/per minute.

HEAT EXCHANGERS - Device specifically designed to transfer heat between two physically separate fluids.

HIGH EFFICIENCY - AFUE percentage. For low-efficiency furnace: less than 71%. Mid-efficiency: 71% to 83%. High efficiency: 84% and higher.

HYDRONICS - Used in radiant floor heating.

INSTANTANEOUS WATER HEATER - Produces hot water on demand. Heater with rated minimum recovery of 3.5 GPH (at 100°F rise) and 4000 BTUs per hour per gallon of self-stored water.

NATURAL GAS - Any gas found in the earth versus manufactured gas.

N.P.T. INLETS - National pipe thread standard.

PROPANE - Component of raw natural gas.

RADIATION - Heat transfer by light reflection. Emission of waves or particles.

REAR OUTLET UNIT - Stack off back of heater instead of out of top.

RECOVERY - Amount of water per hour (GPH) heater will deliver after the first hour of use, not including storage.

ROUGHING IN - Sizes for space left around heater.

SEMI-INSTANTANEOUS - Heater has steam in tubes and water in shell. (Instantaneous: Steam in shell, water in tubes).

SHIPPING COSTS - CFF: high price, fast delivery; ANR: low price, slow delivery

SIZING - Procedure to determine how large (in BTUs) a heating unit is needed. Too small will not deliver sufficient heat; too large increases energy costs. Furnace sizing is affected by square footage of home, amount of ceiling/wall insulation, window area, storm doors and windows, etc.

STANDBY LOSS - Amount of heat lost per hour (measured in %) while heater is in standby mode (no water being drawn). Loss can occur through jacket or piping. Average: 2% to 4%.

TEMPERATURE RISE - Difference between existing and desired water temperature. Number of degrees (°F) water must be raised, whether from inlet or preheated water.

THERM - Measurement of heat. One (1) therm = 100,000 BTUs.

VENTING -

Type A: Three (3) walls of stainless steel, used for oil water heaters. Withstands higher temperatures.

Type B: Two (2) walls of aluminum, used for gas water heaters. Melts at lower temperatures than Type A.

Type L: Two (2) walls, inner of stainless, outer of aluminum. For lower stack temperatures and lower clearances to combustibles.

THERMAL EFFICIENCY - Ratio of BTU output of water to BTU input of fuel. Output only includes what is delivered from heater as hot water.

VACUUM (hg) - Scale for measuring pressure less than atmospheric. 0 = atmospheric pressure. 29.92 = perfect vacuum, no pressure.

VALVE -

1. **Automatic** - Valve and operator controlling gas supply to burner(s) during normal operation of appliance. Operator may be actuated by gas pressure on flexible diaphragm, electrical or mechanical means or any other means.

2. **Semiautomatic** - Valve opens manually and closes automatically, or vice versa.

3. **Burner** - Manually or mechanically operated valve permitting control of flow of gas.

4. **Diaphragm-type Automatic** - Device consisting of automatic valve actuated by application of gas pressure on flexible diaphragm.

5. **Electric-type Automatic** - Device actuated by electricity for controlling gas supply.

6. **Manual Main Shutoff** - Manually operated valve in gas line for completely turning on or shutting off gas supply to appliance (pilots may have independent shutoff valves).

7. **Safety Shutoff** - Valve automatically closed by safety control system or by emergency device. May be automatic or manual type.

VENT-AIR INTAKE TERMINAL - Used with direct vent water heater, located on outside of tank. Takes in combustion air from outside atmosphere and discharges combustion products.

1. **Vent Terminal** - Fitting at end of vent pipe that directs flue products into outside atmosphere.

2. **Air Intake Terminal** - Fitting at inlet of air intake pipe allowing outside atmosphere into air intake pipe.

VENT LIMITER - Limits flow of air or gas from atmospheric diaphragm chamber of gas pressure regulator to atmosphere. May be device or orifice.

VENTING SYSTEM - Gas vent, chimney or single-wall pipe (and vent connector, if used) assembled to form continuous open passageway from gas appliance to outdoor atmosphere to remove vent gasses.

ZONED - Living areas separated into different spaces, with each space's heat controlled independently.