HEATING PLANT

GLOSSARY

1. GENERAL

1.01 This section lists a collection of terms and definitions pertaining to heating plants.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The terms and definitions listed in this section apply to the following sections*:

SECTION	TITLE
760-530-100	Heating Plant Fundamentals
760-530-102	Steam Boilers
760-530-104	Hot Water Boilers
760-530-105	Domestic Hot Water Heaters
760-530-106	Warm Air Furnaces
760-530-108	Heating Plant Controls
760-530-110	Flame Safeguard Controls
760-530-112	Heating Plant Relief Devices
760-530-114	Combustion Principles and Fuel Storage
760-530-116	Heating Plant Acceptance Testing
760-530-118	Heating Plant Electrical Design

2. TERMS AND DEFINITIONS

2.01 The following alphabetical listing of terms and definitions apply to the sections listed in Part 1:

Boiler Heating Surface

This is the area of the heat transmitting surfaces in contact with the water in the boiler on one side and the fire or hot gases on the other.

* Check Divisional Index 760 for availability.

Boiler Horsepower

This is the equivalent evaporation of 34.5 pounds of water per hour at 212°F to steam at 212°F. This is equal to a heat output of 33,475 BTUs per hour, which is equal to approximately 140 square feet of steam radiation (EDR).

Boiler—Hot Water

A low-pressure hot water boiler is a self-contained closed vessel in which water is heated and no steam generated. The temperature does not exceed 250°F, and the pressure does not exceed 160 psig.

Boiler—Hot Water Supply (Domestic Hot Water Heater)

A low-pressure hot water supply boiler is a low-pressure hot water boiler except that most or all of the hot water is not returned to the boiler. It is used external to the circulating loop. An example of this is domestic hot water piped in a loop to assure immediate hot water availability at each fixture, most of which is used for washing or culinary purposes.

Boiler Steam—Low Pressure

A low-pressure steam boiler is a self-contained closed vessel in which water is heated and steam generated under pressure or vacuum by the direct application of heat. The pressure does not exceed 15 psig.

Bonnet

The bonnet is the top section of the heat exchanger of a warm air furnace.

Burner, Atmospheric Gas

This is a burner employing the energy of a jet of gas to inject air for combustion into the burner and mix it with the gas.

Burner, Power Gas

This is a burner in which either gas or air, or both, are supplied at pressures exceeding:

- Gas supply line pressure
- Atmospheric air pressure.

This added pressure is applied at the burner.

BTU (British Thermal Unit)

This is the quantity of heat required to raise the temperature of 1 pound of water 1°F.

Combustion Chamber

This is the portion of a heating plant within which combustion occurs. In some cases, it is also referred to as the firebox.

Condensate

In steam heating, the water formed by cooling and condensing steam is called condensate.

Conduction (Thermal)

This is the transfer of heat through a material by passing it from molecule to molecule.

Conductor (Thermal)

This is a material capable of readily transmitting heat by means of conduction.

Continuous Self-Checking

This is a feature of a flame safeguard control to shut down the burner in event of a flame signal circuit failure, including a flame signal simulating failure.

Control, Limit

This is a control responsive to changes in pressure, temperature, or liquid level and is to be used for limiting the operation of the controlled equipment. These controls are manual reset. Operation of the controlled equipment outside the established limit is unsafe.

Control, Operating

A device used to initiate operation of the burner on demands of variations in temperature, pressure, water level, time, or other influence.

Control, Safety

See Control, Limit.

Controls, Combustion

A system of controls that assure safe starting and operation of the burner.

Convection

This is the transmission of heat by the circulation (either natural or forced) of a liquid or a gas such as air. If natural, it is caused by the difference in density of hotter and colder liquid or gas.

Cooling Leg

This is a length of uninsulated pipe through which the condensate flows to a trap and which has a sufficient cooling surface to permit the condensate to dissipate enough heat to prevent flashing when the trap opens. In the case of a thermostatic trap, a cooling leg may be necessary to permit the condensate to drop a sufficient amount in temperature to permit the trap to open.

Direct-Fired Appliance

This is a device in which combustion products (flue gases) are mixed with the medium (air) to be heated.

Dry-Back

This is a type of boiler construction in which the rear combustion chamber is refractory lined and not in contact with the boiler water. A term generally applied to Scotch-type boilers.

EDR (Equivalent Direct Radiation)

See Square Foot of Heating Surface.

Equipment Ground

A separate metallic connection (green wire) is required to establish ground potential on all

electrical equipment framework and raceways. The equipment grounding conductor requirements (green wire) are covered in Section 802-001-198 and the National Electric Code, Article 250-95.

Eutetic Compound

This is a low-melting temperature conductive alloy. It is used as a temperature limiting control on electric warm air furnaces. It carries the full load current of the heating element. This compound melts due to an ambient temperature rise caused by the heating element and not because of any heating effect of the electrical current it is carrying.

Explosion, Fireside

This is combustion occurring within a confined space at such a rapid rate as to cause detonation.

FAI (Fresh Air Intake)

This is fresh (outside) air intake which provides combustion air supply to the boiler room.

Feed Water

This is water returned to the boiler, consisting of condensate and new makeup water.

Flame Safeguard Control

This is a safety control which provides a means for starting the burner in the proper sequence, proving that the pilot and or main burner flame is established, and supervising the main flame during burner operation. Safety shutdown occurs if the pilot or burner flame is not established, or if the flame goes out.

Flash Point (Oil)

This is the lowest temperature at which the fuel oil gives off vapors that will ignite when a small flame is passed over the surface of the oil.

Gas Appliance Pressure Regulator

This is a pressure-balancing device which will maintain the gas pressure to a burner within ±10 percent of the operating pressure at any given rate from maximum to minimum firing rates, with variations in inlet pressure not exceeding ±40 percent of the rated inlet pressure.

Gauge Pressure

This is the pressure above that of the atmosphere. It is the pressure indicated on an ordinary pressure gauge and is expressed as a unit pressure, such as pounds psig.

Header (Steam Supply)

This is a piping manifold to distribute the steam supply to branch circuits.

Heat

Heat is the form of energy into which all other forms may be changed. Heat always flows from a body of higher temperature to a body of lower temperature.

Heating Value

This is the amount of heat energy (BTU) released when a pound of fuel is burned.

Indirect-Fired Appliance

This is a device, so designed, that combustion products (flue gases) are not mixed with the medium (air) to be heated. The heat of combustion is transferred through the metal walls of the heat exchanger to the air.

King Valve (Steam Stop)

This is the main steam isolating valve between the boiler and steam supply piping. This valve is also called the main shutoff valve.

Lay-Up Period

This is the period when the boiler has been shut down for seasonal or routine maintenance, repairs, alterations, or for other similar reasons.

Lockout

See Safety Shutdown.

Makeup Water

This is water added to the condensate from outside the boiler water system.

Manual Reset

This is the manual operation required to restart a system after a safety shutdown.

MBh

This is 1000 BTUs per hour.

Modulation

This is changing the firing rate in small increments to balance the firing rate with the load to maintain operation between set limits.

Mud Ring (Mud Leg)

This is the bottom of the water leg or other area of a boiler designed to collect dirt or other foreign matter for removal by blowdown.

Pilot, Constant (Standing)

This is a pilot that burns continuously, regardless of whether the main burner is off or on.

Pilot, Intermittent

This is a pilot that is normally electric-spark ignited each time there is a call for heat and burns without turndown the entire time the main burner is firing.

Pilot, Interrupted

This is a pilot that is electrically-ignited automatically each time there is a call for heat and is cut off automatically at the end of the trial-for-ignition period of the main burner.

Pilot Proved

This is a pilot that has been proved by a flame-detection device.

Prepurge

This is a period of time on each burner start-up cycle during which air is introduced into the combustion chamber and associated flue passages to completely replace the air or fuel-air mixture prior to an attempt to initiate ignition.

Pressure-Temperature Relief Valve

These are relief valves used on domestic hot water heaters and mixing valves in domestic hot water supply piping set to release upon excessive temperature or pressure.

Priming

This is the entrainment of water with the steam as it leaves the boiler.

psig

This is pounds per square inch gauge.

Puff-Back

This is combustion occurring at light-off of a burner causing flame and/or products of combustion to exit the firebox through and around the burner. This is generally caused by delayed ignition and is not accompanied by detonation.

Radiation (Thermal)

This is transmission of heat through space by wave motion, ie, passage of heat from one object to another without warming the space between.

Recognized National Testing Agencies

These are Underwriters Laboratories Incorporated, American Gas Association, and the Factory Mutual System.

Recycle

This is the process of automatically going through another operating cycle following a burner shutdown in an attempt to restart a burner.

Relight

This is an immediate restoration of ignition without preignition purging or interlock checks after loss of the main burner flame.

Safe Start Check

This is a feature of flame safeguard controls to prevent a premature burner start if a flame is detected or if a condition simulating a flame exists in the flame detection circuit.

Safety Relief Valve

This is a pressure-relieving device used on hot water heating boilers.

Safety Shutdown (Lockout)

This is shutting off all fuel and ignition energy to the burner by means of a safety control(s) so that restart cannot be accomplished without manual reset.

Safety Valve

This is a pressure-relieving device used on steam boilers.

SSOV (Safety Shutoff Valve)

This is a valve that is automatically closed, by the flame safeguard control or any limit control, that completely shuts off the fuel supply to the burner.

SSU (Saybolt Seconds Universal)

This is a measure of oil viscosity at 100°F. The higher the number, the greater the resistance to flow.

Square Foot of Heating Surface (Equivalent) or Equivalent Direct Radiation (EDR)

By definition, this is the amount of heating surface which will give off 240 BTUs per hour when filled with a heating medium at 215°F and surrounded by air at 70°F. The equivalent square foot of heating surface may have no direct relation to the actual surface area.

Thermostat

This is a device which responds to a temperature that will either perform a switching function at a set temperature or modulate a controlled device in response to changes in temperature.

Trial for Ignition

This is the period of time the pilot or main burner fuel is permitted to be delivered into the combustion chamber before the flame-sensing device is required to detect flame.

Viscosity

This is the measure of the resistance of a liquid to flow at a definite temperature. It is measured in the number of seconds it takes a given amount of the fluid to pass through a certain opening (orifice) at 100°F.

Wet-Back

This is a type of boiler construction in which the rear combustion chamber is water jacketed. This term is generally applied to Scotch-type boilers.