

ACCESSIBLE. ¹

Readily. Having direct access without the need of moving or removing any panel, door or similar covering of the item described.

Reasonably. Having access to, but which first may require the removal of a panel, door or similar covering of the item described.

ACTIVATION.

Chemical. Treatment of a substance by heat, radiation, or other activating reagent to produce a more complete or rapid chemical or physical change.

Electrical. The process of treating a cathode to increase its rate of reduction.

AIR.

The mixture of oxygen, nitrogen and other gases which, with varying amounts of water vapor, forms the atmosphere of the earth. Also referring to any or all air for combustion, heating, cooling, ventilation and other uses as follows:

Ambient. Air that surrounds the equipment.

Atmospheric. Air under the prevailing atmospheric conditions.

Combustion. Air required for safe and proper combustion of fuel gas.

Dilution. Air which enters a draft regulator similar device and mixes with the flue gases.

Excess. Air which passes through the combustion chamber and any flues in excess of that which is theoretically required for complete combustion.

Exhaust. Air removed from a space and not reused.

Outdoor. Air taken from the outdoors and, therefore, not previously circulated through the system.

Primary. Air introduced into a burner at the mixer head, which mixes with the gas before reaching the port(s).

Recirculated. Air removed from a space and intended for reuse as supply air.

Return. Air removed from a space and recirculated or exhausted.

Secondary. Air externally supplied to the flame at the point of combustion.

Standard. Air at standard temperature and pressure, namely 70°F (21°C) and 29.92 inches (760 mm mercury column, having a specific weight of 0.075 pounds per cubic foot (1.20 kg/cu m). [Indicates a temperature of 70°F (21°C). The ISO standard (59°F) might be more appropriate to allow direct comparisons with turbines].

Supply. That air delivered to each or any space in the system or the total delivered to all spaces in the system.

Ventilation. That portion of supply air which comes from the outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

AIR INLET, PRIMARY.

The opening(s) through which primary air is admitted into a burner.

AIR SHUTTER.

An adjustable device for varying the size of the air inlet(s) regulating primary or secondary air.

Automatically-Operated. An air shutter operated by an automatic control.

ALKALINE FUEL CELL (AFC).

A type of hydrogen/oxygen fuel cell in which the electrolyte is concentrated KOH (35 – 50%, a liquid) and hydroxide ions (OH⁻) are transported from the cathode to the anode.

Temperature of operation is typically in the range of 60 - 90°C

Anode reaction: $\text{H}_2 + 2 \text{OH}^- \rightarrow 2 \text{H}_2\text{O} + 2 \text{e}^-$

Cathode reaction: $\frac{1}{2} \text{O}_2 + \text{H}_2\text{O} + 2 \text{e}^- \rightarrow 2 \text{OH}^-$

Overall reaction: $\text{H}_2 + \frac{1}{2} \text{O}_2 \rightarrow \text{H}_2\text{O}$

ANODE.

The negative electrode at which oxidation occurs.

APPLIANCE.

Any device which utilizes gas as a fuel or raw material to produce light, heat, power, refrigeration or air conditioning (also see Gas Utilization Equipment).

APPLIANCE, COGENERATION.

A self-contained, fueled appliance providing electrical energy and thermal energy to be used remote from or adjacent to its location.

APPLIANCES, AUTOMATICALLY-CONTROLLED.

Appliances equipped with automatic devices which (1) accomplish complete “turn-on” or “shut-off” of the gas to the main point of consumption or (2) graduate the gas supply to the main burner, but do not effect complete shutoff of the gas.

APPROVED.¹

Acceptable to the authority having jurisdiction.

AUTHORITY HAVING JURISDICTION.¹

The organization, office or individual responsible for “approving” equipment, an installation or a procedure.

AUXILIARY POWER.

Power from an independent source that functions as required to augment/support various performance criteria established for the prime power source.

AVAILABILITY.

A factor based on the ratio (%) of a power source's fully operational hours divided by total planned/expected hours of full operation.

AVAILABILITY FACTOR.

The ratio of the time a generating unit or piece of equipment is ready for, or in service to, the total time interval under consideration.

BACK PRESSURE.

Pressure against which a fluid or gas is flowing, resulting from friction in lines, restrictions in pipes, valves, pressure in vessel to which fluid is flowing, hydrostatic head, or other impediment that causes resistance to fluid flow.

BAFFLE.

An object placed in an appliance to change the direction of or retard the flow of gas, air, gas-air mixtures, or flue (exhaust) gases.

BAFFLE, FLUE GAS.

An object in the path of the flue gases and exposed to flue gases or radiant heat, which is intended to restrict or modify flue gas flow. It may be a projection from the heat exchanger or suspended in the flue gas passages by some other means.

Load-Bearing. A flue gas baffle which adds support, strength or rigidity to a heat exchanger or flue.

Nonload-Bearing. A flue gas baffle, which does not add support, strength or rigidity to a heat exchanger or flue.

BALANCE-OF-PLANT.

Supporting/auxiliary components, based on site-specific requirements and integrated into a comprehensive power system package centered around the power source.

BASE.

The lowest supporting frame of structure of the appliance, exclusive of legs.

BASE LOAD.

BEARING, OILLESS.

A sleeve bearing of porous material which depends solely on the porosity of the metal for oil storage.

BIPOLAR PLATES.

Conductive plate in a fuel cell stack which acts as an anode for one cell and a cathode for the adjacent cell. The plate may be made of metal or a conductive polymer (which may be a carbon-filled composite). The plate usually incorporates flow channels for the fluid feeds and may also contain conduits for heat transfer.

BLACK START.

A power source's ability to power up from a cold shut down condition to fully operational status through a dedicated auxiliary power source that is totally independent of external systems.

BLOWDOWN.

The difference between the opening and closing pressures of a relief/safety valve.

BLOWER.

A fan used to force air and/or gas under pressure.

BOOST REGULATOR.

BRITISH THERMAL UNIT.

The mean British Thermal Unit (BTU) is 1/180 of the heat required to raise the temperature of one pound (1lb) of water from 32°F to 212°F at a constant atmospheric pressure. It is about equal to the quantity of heat required to raise one pound (1 lb.) of water 1°F.

BURNER.

A device for the final conveyance of the gas, or a mixture of gas and air, to the combustion zone (also see Main Burner).

Forced-Draft. A burner for which air for combustion is supplied by a fan ahead of the gas utilization equipment.

Induced-Draft. A burner which depends on the draft induced by a fan beyond the gas utilization equipment for its proper operation.

Injection "Bunsen, Type. A burner employing the energy of a jet of gas to inject air for combustion into the burner and mix it with the gas.

Injection Type, Atmospheric. A burner in which the air at atmospheric pressure is injected into the burner by a jet of gas.

Luminous or Yellow-Flame. A burner in which secondary air only is depended on for combustion of the gas.

Power. A burner in which either gas or air, or both, are supplied at pressures exceeding the line pressure for gas and atmospheric pressure for air, this added pressure being applied at the burner.

Premixing. A power burner in which all or nearly all of the air for combustion is mixed with the gas as primary air.

Pressure. A burner which is supplied with a gas-air mixture under pressure, usually from 0.5 to 14.0 inches water column (1/8 to 3.5kPa) and occasionally higher.

BURNER, AUTOMATICALLY-LIGHTED.

One where gas to the main burner is normally turned on and ignited automatically.

BURNER HEAD.

That portion of a burner beyond the outlet end of the mixer tube which contains the ports.

CAPACITY FACTOR.

The ratio of the average power load of an electric power source to its rated capacity over a selected period of time. (Also known as “plant factor”).

CAPITAL RECOVERY FACTOR.

CATALYST.

A chemical substance that increases the rate of a reaction without being consumed; after the reaction it can potentially be recovered from the reaction mixture chemically unchanged. The catalyst lowers the activation energy required, allowing the reaction to proceed with more quickly or at a lower temperature.

CATALYST COATED MEMBRANE (CCM).

Term used to describe a membrane (in a PEM fuel cell) whose surfaces are coated with a catalyst/carbon/binder layer. (See also Membrane Electrode Assembly [MEA].)

CATALYST LOADING.

The amount of [catalyst](#) incorporated in the fuel cell per unit area. Typical units for PEMFC are mg/cm².

CATHODE.

The positive electrode at which reduction occurs.

CELL.

Active Area.

Components.

Coolant.

Degradation Rate.

IR Loss.

Life.

Power Density.

Pressure.

Pressure Differential.

Stacks.

Temperature.

Temperature Gradient.

Voltage.

CIRCUIT, ELECTRIC.

High-Voltage. A circuit operating at more than 600 volts nominal.

Low-Voltage. A circuit at voltages from 31 to 600 volts inclusive.

Extra-Low-Voltage. A circuit operating at a voltage up to and including 30 volts.

(Definitions for “High-Tension”, “High-Voltage” and “Low-Voltage” conflict with the commonly accepted utility definitions for these terms.)

CIRCUIT, SAFETY-CONTROL.

A circuit or portion thereof involving one or more safety controls in which failure due to grounding, opening or shorting of any part of the circuit can cause unsafe operation of the controlled equipment.

COAL GAS.

A fuel gas obtained through the carbonization (distillation by heat in the absence of air) of coal.

COGENERATION.

The simultaneous on-site production of electric energy and process steam or heat from the same power source.

COMBUSTION.

The rapid oxidation of fuel gases accompanied by the production of heat, or heat and light.

COMBUSTION CHAMBER.

The portion of an appliance within which combustion occurs.

COMBUSTION PRODUCTS.

Constituents resulting from the combustion of a fuel gas with the oxygen of the air, including the inert but excluding excess air.

COMPRESSION.

A system of forces that reduces the volume occupied by a specific quantity of gaseous material.

COMPRESSOR.

A device used for increasing the pressure and density of gas. Also see TURBOCHARGER.

COMPRESSOR, FUEL GAS.

A pump or machine for reducing the volume and increasing the pressure of fuel gas.

CONDENSATE (CONDENSATION).

The liquid which separates from a gas (including flue gases) due to a reduction in temperature.

CONTROL, POINT OF.

Cut-Off. The temperature at which a control acts to shut off the gas to the main burner.

Cut-on. The temperature at which a control acts to turn on the gas to the main burner.

CONTROLS.

Devices designed to regulate the gas, air, water or electrical supplies to the controlled equipment. These may be manual, semi-automatic or automatic.

Combustion. A control which automatically regulates the firing rate at predetermined air-fuel ratios in accordance with load demand.

High-Low Firing. The action of a combustion control which positions the air and fuel supply for low-fire and for high-fire in accordance with load demand.

Modulating. The action of a combustion control which gradually varies the air and fuel supplies within limits in accordance with load demand.

Limit. A control which automatically responds to changes in temperature, pressure, flow or level for limiting the operation of the controlled equipment. This device is not considered an operating control.

Operating. A control, other than a safety control or interlock, to start or regulate equipment operation according to load demand and to stop or regulate equipment operation on satisfaction of demand or upon reaching normal temperature or pressure in the equipment being operated. An operating control also may actuate auxiliary equipment.

Safety. Automatic controls and interlocks (including relays, switches, and other auxiliary equipment used in conjunction therewith to form a safety-control system) which are intended to prevent unsafe operation of the controlled equipment.

Safety, Primary. A control responsive directly to flame properties; sensing the presence of flame and causing fuel to be shut off in the event of ignition or flame failure requiring manual reset.

CONTROLS, FUEL GAS.

Devices designed to regulate the fuel gas supply to the controlled equipment. These may be manual, semi-automatic or automatic.

CONVECTION.

Stirring or hydrodynamic transport. Generally fluid flow occurs because of natural convection (convection caused by density gradients), and forced convection, and may be characterized by stagnant regions, laminar flow and turbulent flow.

COOLANTS.

Nontoxic. Transfer fluids having a Gosselin rating of one (1), including propylene glycol, mineral oil, polydimethyloil oxane, Freon and FDA-approved water additives. Such fluids are

deemed essentially nontoxic by the BOCA Basic/National Plumbing Code or GRAS (generally recognized as safe) by the FDA (Food and Drug Administration).

Toxic. Transfer fluids having a Gosselin rating of two (2) or more, including ethylene glycol, hydrocarbon oils, ammonia refrigerants and hydrazine. Such fluids are deemed essentially toxic by the BOCA Basic/National Plumbing Code.

COUNTER FLOW.

A flow in opposite directions in adjacent parts of an apparatus, as in a heat exchanger.

CROSSFLOW.

A flow going across another flow.

CUBIC FOOT, STANDARD.

The amount of gas, saturated with water vapor, which would occupy one cubic foot when at a temperature of 60°F and under an absolute pressure of 30 inches mercury column.

CUBIC METER, STANDARD.

The amount of dry gas which would occupy one cubic meter when at a temperature of 15°C and under an absolute pressure of 760 millimeters (mm) mercury column.

(The **Cubic Foot Standard** and the **Cubic Meter Standard** are not consistent. The **CF is a Wet standard** and the **CM is a Dry standard**. Should both be the same to facilitate conversion.)

CURRENT COLLECTOR.

Term used to describe the conductive material in a fuel cell which collects electrons (on the anode side) or disburse electrons (on the cathode side). The current collectors are microporous (to allow for fluid flow through them) and lie in between the catalyst/electrolyte surfaces and the bipolar plates.

CURRENT DENSITY.

A vector-point function describing the magnitude and direction of charge flow per unit area, generally expressed in amperes per square meter.

DESULFURIZER.

A component for removing sulfur from a fuel mixture.

DIFFUSION.

Movement of a species under the influence of a gradient of chemical potential (i.e. a concentration gradient).

DIRECT INTERNAL REFORMING.

DIRECT METHANOL FUEL CELL (DMFC).

A type of fuel cell in which the fuel is methanol (CH₃OH), in gaseous or liquid form. The methanol is oxidized directly at the anode with no reformation to hydrogen. The electrolyte is typically a [PEM](#).

Fuel Cell Glossary

Anode reaction: $\text{CH}_3\text{OH} + \text{H}_2\text{O} \rightarrow \text{CO}_2 + 6\text{H}^+ + 6\text{e}^-$

Cathode reaction: $6\text{H}^+ + 3/2\text{O}_2 + 6\text{e}^- \rightarrow 3\text{H}_2\text{O}$

Overall reaction: $\text{CH}_3\text{OH} + \text{H}_2\text{O} + 3/2\text{O}_2 \rightarrow \text{CO}_2 + 3\text{H}_2\text{O}$

DISCRETIONARY DOWNTIME.

DISPERSED GENERATOR.

DISTILLATE.

A product formed by heating a liquid in a vessel and collecting and condensing the resulting by-product(s).

EFFICIENCY.

A measure (usually a ratio) of the useful energy provided by a dynamic system versus the total energy supplied to it during a specific period of operation.

EFFLUENT.

The products of combustion plus the excess air being discharged from gas utilization equipment (Also see Flue Gases).

ELECTRICAL, CURRENT.

The net transfer of electric charge per unit time; expressed as amperes.

ELECTRICAL, POWER FACTOR. (see POWER FACTOR).

ELECTRICAL, SINGLE PHASE.

A single alternating-current voltage.

ELECTRICAL, THREE PHASE.

Alternating-current voltages that differ in phase by one-third of a cycle or 120°.

ELECTRICAL DIAGRAMS.

Connection. A diagram which shows the connections of an installation or its component devices or parts. It may cover internal or external connections, or both, and contains such detail as is needed to make or trace connections that are involved. The Connection Diagram usually shows general physical arrangement of the component devices or parts.

Schematic. A diagram which shows, by means of graphic symbols, the electrical connections and functions of a specific circuit arrangement. The Schematic Diagram facilitates tracing the circuit and its functions without regard to the actual physical size, shape or location of the component devices or parts.

Schematic - Ladder Form. A diagram drawn in the form of a vertical ladder. The outer vertical lines represent the electrical supply conductors. The horizontal steps represent each individual circuit with all component devices or parts.

ELECTRICAL, EFFICIENCY.

The ratio of useful electrical real power output to the total electrical power input.

ELECTRICAL EQUIPMENT. See EQUIPMENT, ELECTRICAL.

ELECTRICAL TRANSIENT.

Any voltage or current which deviates from the normal steady-state condition.

Lighting Transient. Any voltage or current which deviates from normal steady-state conditions due to electrical disturbances in the atmosphere.

Line Transient. Any voltage or current which deviates from normal steady-state conditions due to collapsing magnetic fields, solid-state switching, motor or inductive inrush, or momentary power losses.

Static Voltage. The voltage created by the buildup of static charges on people or objects.

ELECTRODE.

An electric conductor through which an electric current enters or leaves a medium, whether it be an electrolytic solution, solid, molten mass, gas, or vacuum.

ELECTRODE ASSEMBLY.

The portion of an automatic ignition system containing the electrode(s) and associated insulators, wire lead terminals, spark gap adjustment means and mounting brackets.

ELECTROSMOTIC DRAG.

ELECTROLYTE.

A non-metallic electrical conductor in which current is carried by the movement of ions.

ELEMENT, HEATING.

All parts which transmit heat from flames or flue gases to the medium being heated and in contact with both.

ELEMENT, THERMALLY-ACTUATED.

That part of a control device which is directly acted upon by temperature changes and originates or supplies motion or energy directly or indirectly to operate a control valve.

EQUIPMENT, ELECTRICAL.

A general term including material, fittings, devices appliances, fixtures, apparatus and the like used as part of, or in connection with, and electrical installation.

EQUIVALENCE RATIO.

EXHAUST HEAT.

EXHAUST HEAT RECOVERY.

EXTERNAL REFORMING.

FAILURE MODES AND EFFECTS ANALYSIS (FMEA)

A structured process of analysis to identify and classify concerns, features and reasoning, and to recommend corrective actions for as many potential failures as is reasonably possible.

FAN.

A device consisting of a rotor and housing for moving air or gas at relatively low pressure differentials.

FILTER.

A device intended to remove solid material from a medium, such as air or fluid.

FLAME SAFEGUARDS.

Also see CONTROLS.

FLAT PLATE CELLS.

FLUE (EXHAUST).

The general term for the passages and conduits through which flue gases pass from the combustion chamber to the outer air.

Appliance. The passage(s) within an appliance through which combustion products pass from the combustion chamber of the appliance to the outlet of the appliance.

Chimney. The passage(s) in a chimney for conveying the flue or vent gases to the outside atmosphere.

FLUE COLLAR.

A projection or recess provided to accommodate the vent connector.

FLUE GASES.

Products of combustion plus excess air in appliance flues or heat exchangers.

FLUE LOSSES.

The sensible heat and latent heat above ambient temperature of the flue gases leaving gas utilization equipment.

FLUE OUTLET.

The opening provided in gas utilization equipment for the escape of the flue gases.

FLUID.

Any substance that can flow, liquid or gas.

FLUID, HEAT UTILIZATION.

A heat transfer fluid that takes thermal energy from heat exchangers and transfers it to customer equipment supplying hot water, space heating and other thermal loads.

FORCED DERATING HOURS.

FORCED OUTAGE.

A power outage that results from the failure of a system component requiring that it be taken out of service immediately, either automatically or manually or an outage caused by improper operation or human error.

FORCED OUTAGE RATE.

The mean number of failures of a component per unit exposure time. Usually exposure time is expressed in years.

FUEL.

Composition.

Conversion.

Preparation.

Processing.

Quality.

Utilization.

FUEL CELL.

An electrochemical device which can continuously convert the chemical energy of a fuel and an oxidant to electrical energy. The fuel and oxidant are typically stored outside of the cell and transferred into the cell as the reactants are consumed. See also [Reversible Fuel Cell](#), [PEMFC](#), [SOFC](#), [MCFC](#), [PAFC](#), [DMFC](#).

FUEL GAS COMPRESSOR.

Also see COMPRESSOR, FUEL GAS.

FUEL GAS CONTROLS.

Also see CONTROLS, FUEL GAS.

FUSIBLE PLUG.

A device which opens and keeps open a relief vent by the melting or softening of a fusible plug or cartridge at a predetermined temperature.

GAS.

Fuel gas, such as natural gas, undiluted liquefied petroleum gases (vapor phase only), liquefied petroleum gas-air mixtures, or mixtures of these gases.

Liquefied Petroleum Gases. The terms Liquefied Petroleum Gases, "LPG", and ULP-Gas, as used In this standard, shall mean and include any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them: propane, propylene, butanes (normal butane or isobutane) and butylenes.

LP Gas-Air Mixture. Liquefied petroleum gases distributed at relatively low pressures and normal atmospheric temperatures which have been diluted with air to produce desired heating value and utilization characteristics.

Natural Gas. Mixtures of hydrocarbon gases and vapors consisting principally of methane (CH_4) in gaseous form.

Normal Butane (n-Butane), technical Grade. A liquefied petroleum gas composed of a minimum of 95 percent n-butane (C_4H_{10}) which may contain other impurities such as isobutane, butylenes and propane not in excess of 5 percent.

Propane MD-5. A special grade of liquefied petroleum gas composed of a minimum of 90 percent liquid volume of propane (C_3H_8) and a maximum of 5 percent liquid volume of propylene (C_3H_6).

GAS CLEANUP.

GAS TURBINE.

GAS UTILIZATION EQUIPMENT.

Any device which utilizes gas as a fuel or raw material, or both (also see Appliance).

GAS VENT.

A passageway, composed of listed factory-built components assembled in accordance with the terms of listing, for conveying flue gases from gas utilization equipment or their vent connectors to the outside atmosphere (also see vent).

GOVERNOR, ZERO.

A regulating device which is normally adjusted to deliver gas at atmospheric pressure within its flow rating.

GRID CONNECTED.

A power delivery interconnection scheme with an independent power source which normally operates in parallel with a utility power system.

GRID ISOLATED.

A power delivery scheme consisting of a independent power source that serves a dedicated load and is not interconnected with the utility power system.

GROSS POWER.

The fundamental power output of an energy source prior to any conditioning and losses associated with the production of power suitable for the connected load.

HALF STACK.

HAZARDOUS LOCATION.

Also see LOCATION, HAZARDOUS.

HEAT CONTENT.

HEAT EXCHANGER.

A vessel in which heat is transferred from one medium to another.

HEATING VALUE (TOTAL).

The number of British Thermal Units (BTU's) produced by the combustion of one cubic foot of gas at constant pressure, when the products of combustion are cooled to the initial temperature of the gas and air, when the water vapor formed during combustion is condensed, and when all the necessary corrections have been applied.

HEATING VALUE.

Lower.

Higher.

HYDROCARBON.

A chemical compound of hydrogen and carbon, such as methane, propane, butane, etc.

IDLE POWER.

IDLE TIME.

IGNITER.

A device which utilizes electrical energy to ignite gas at a pilot burner or main burner.

IGNITION, AUTOMATIC.

Ignition of gas at the burner when the gas controlling device is turned on, including reignition if the flames on the burner have been extinguished by means other than by the closing of the gas controlling device.

IGNITION DEVICE.

A device for igniting gas at a burner. It may be a pilot or an igniter.

Direct. An igniter utilized to ignite gas at a main burner.

IGNITION SOURCE.

Continuous. An ignition source which, once placed in operation, is intended to remain ignited or energized continuously until manually interrupted.

Intermittent/Continuous. An ignition source which is ignited or energized upon equipment user initiation of the operational cycle and which remains continuously ignited or energized during the equipment use cycle. The ignition source is extinguished or deenergized when the equipment use cycle is completed.

Intermittent. An ignition source which is automatically ignited or energized when the equipment is called on to operate and which remains continuously ignited or energized during each period of main burner operation. The ignition source is automatically extinguished or deenergized when each main burner operating cycle is completed.

Intermittent/Interrupted. An ignition source which is ignited or energized upon equipment user initiation of the operational cycle and which is extinguished or deenergized after the equipment use cycle has been initiated.

Interrupted. An ignition source which is automatically ignited or energized when the equipment is called on to operate and which remains ignited or energized during the main burner Flame-Establishing Period. The ignition source is automatically extinguished or deenergized when each main burner Flame-Establishing Period is completed.

IGNITION SYSTEM.

Direct. A system in which the ignition means functions to ignite the main burner gas directly and in which a flame sensing means or safety shutoff device senses main burner flames or the absence of main burner flames.

Indirect. A system in which the ignition means functions to ignite the main burner gas and the igniter sensing device proves the ability of the ignition means to ignite the main burner gas.

Intermittent. A system in which the ignition source is automatically shut off when the equipment is in an off or standby condition.

IGNITION SYSTEM, AUTOMATIC.

A system designed to ignite and re-ignite a main burner. Such systems shall:

Prove the presence of either the ignition source or main burner flame, or both.

Automatically ignite gas at the main burner or at the pilot burner so that the pilot can ignite the main burner, and

Automatically act to shut off the gas supply to the main burner or to the pilot burner and main burner, when the supervised flame or ignition source is not proved.

IGNITION SYSTEM TIMINGS.

Flame-Establishing Period. The period of time between initiation of gas flow and proof of the supervised flame or between the proof of supervised flame and initiation of gas flow. This may be applicable to proof of the ignition source or main burner flame, or both.

Flame Failure Re-ignition Time. The period of time between loss of the supervised ignition source or the supervised main burner flame and a re-ignition attempt. During this time period the main burner gas supply is not shut off.

Flame Failure Response Time. The period of time between loss of the supervised ignition source or the supervised main burner flame and the action to shut off the gas supply.

Ignition Activation Period. The period of time between energizing the main gas valve and deactivation of the ignition means prior to the lockout time.

Lockout Time. The period of time between initiation of gas flow and the action to shut off the gas flow in the event of failure to establish proof of the supervised ignition source or the supervised main burner flame. Reinitiating the lighting sequence requires a manual operation.

Maximum Time. The maximum allowable time for the specified function of any device.

Minimum Time. The minimum allowable time for the specified function of any device.

Purge Time. The period of time intended to allow for the dissipation of any unburned gas or residual products of combustion.

Pre-purge Time. The purge time which occurs at the beginning of a burner operating cycle prior to initiating ignition.

Post-purge Time. The purge time which occurs at the end of a burner operating cycle.

Recycle Time. The period of time between shutoff of the gas supply following loss of the supervised ignition source or the supervised main burner flame and reactivation of the ignition source.

IMPURITIES.

Undesirable foreign material(s) in a pure substance or mixture.

INDIRECT INTERNAL REFORMING.

INLET TEST PRESSURES, NORMAL.

Those pressures specified for testing purposes at which adjustment of burner ratings and primary air adjustments are made.

INPUT RATING.

The gas-burning capacity of equipment in BTU's per hour as specified by the manufacturer. Input ratings are based on sea level operation and need not be changed for operation up to 2,000 feet (610 m) elevation. For operation at elevations above 2,000 feet (610 m), input ratings should be reduced at the rate of four (4) percent for each 1,000 feet (305 m) above sea level.

INTERCONNECT.

To link power systems in a manor that enables them to draw on one another's reserves in time of need.

INTERCOOLER.

A heat exchanger for cooling gas between stages of a multistage compressor with a consequent saving in power.

INTERLOCK.

A control to prove the physical state of a required condition and to furnish that proof to the safety shutoff device circuit.

INTERNAL MANIFOLDING.

INTERNAL REFORMING.

INTERRUPTER, MECHANICAL.

A device which provides for mechanical closure of the gas flow to the main burner by positive means such as an applied manual force through a linkage, lever handle, spring or similar mechanical means.

IR LOSS

In an electrolytic cell, the loss equal to the product of the current (I) passing through the cell and the resistance (R) of the cell. Also referred to as IR drop.

I²R LOSS.

Power loss due to the current (I) flow through the resistance (R) of a conductor.

ISLANDING.

Operation of a non-utility power source with or without a portion of an electric utility system, isolated from the remainder of the utility system.

ISOLATED OPERATION.

A mode of operation in which the fuel cell power plant is separated, electrically and mechanically, from all other sources of electrical energy. (See also GRID ISOLATED).

JOINTS.

Points of connection: between heat transfer surfaces; between positive and negative pressure zones within components of the power plant; and between power plant components.

LABELED¹.

Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the authority having jurisdiction and concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

LEVELIZED COST.

LIQUID.

A substance that, unlike a solid, flows readily but, unlike a gas, does not tend to expand indefinitely.

LISTED¹.

Equipment or materials included in a list published by a nationally recognized testing laboratory, inspection agency, or other organizations concerned with product evaluation that maintains periodic inspection of production of listed equipment or materials, whose listing states either that the equipment or material meets nationally recognized standards or has been tested and found suitable for use in a specified.

LOAD DURATION CURVE.

A curve of loads, plotted in descending order of magnitude, against time intervals for a specified period.

LOAD-FOLLOWING.

A mode of operation where fuel cell power plant is generating variable power depending on the ac load demand.

LOCATION, HAZARDOUS (CLASSIFIED).

Any area or space where combustible dust, ignitable fibers, or flammable, volatile liquids, gases, vapors or mixtures are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

LOW EMISSION VEHICLE (LEV).

LOWER EXPLOSIVE LIMIT (LEL).

The lowest concentration of a flammable gas/vapor in air in which flame is propagated.

MAIN BURNER.

A device or group of devices essentially forming an integral unit for the final conveyance of gas or a mixture of gas and air to the combustion zone, and on which combustion takes place to accomplish the function for which the equipment is designed.

MANIFOLD.

The conduit of an appliance which supplies gas to the individual burner.

MATERIALS.

Combustible. As pertaining to materials adjacent to or in contact with heat-producing appliances, vent connectors, gas vents, steam and hot water pipes, and warm air ducts, shall mean materials made of or surfaced with wood, compressed paper, plant fibers, or other materials that are capable of being ignited and burned. Such materials shall be considered combustible even though flame-

proofed, fire-retardant treated, or plastered.

Noncombustible. For the purpose of this standard, materials which are not capable of being ignited and burned, such as materials consisting of, or a combination of, steel, iron, brick, tile, concrete, slate, asbestos, glass and plaster.

MAXIMUM OPERATING PRESSURE.

Also See OPERATING PRESSURE, MAXIMUM.

MEANTIME BETWEEN FAILURES.

The mean exposure time between consecutive failures of a component. It can be estimated by dividing exposure time by the number of failures in that period, provided that sufficient number of failures has occurred in that period.

MEANTIME BETWEEN FORCED OUTAGE.

A measure of the reliability of a power source, equal to its average operating between forced outages, as calculated on a statistical basis from the known failure rates of various components of the power source.

MEAN TIME TO REPAIR.

The time interval (hours) that may be expected to return a failed equipment to proper operation.

MEMBRANE.

The separating layer in a fuel cell which acts as electrolyte (a cation-exchanger) as well as a barrier film separating the gases in the anode and cathode compartments of the fuel cell.

MEMBRANE ELECTRODE ASSEMBLY (MEA).

Structure consisting of a proton-exchange membrane with surfaces coated with catalyst/carbon/binder layers and sandwiched by two microporous conductive layers (which function as the gas diffusion layers and current collectors).

MIXER.

The combination of mixer head, mixer throat and mixer tube.

Mixer Head. The portion of an injection (Bunsen) type burner, usually enlarged, into which primary air flows to mix with the gas stream.

Mixer Throat. The portion of the mixer which has the smallest cross-sectional area and which lies between the mixer head and the mixer tube.

Mixer Tube. The portion of the mixer which lies between the throat and the burner head.

MIXER FACE.

The air inlet end of the mixer head.

MODE.

Disconnect. A condition of disconnection of the power plant from a utility grid following an unclearing of the interrupt mode.

Interrupt. A condition of momentary interruption of the current flow from the power plant to a utility grid.

MODEM.

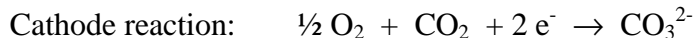
A device used to connect a computer to a telephone line for transmission and reception of information.

MODULE.

A self-contained unit which serves as a building block for the overall structure of a power source or a subsystem thereof.

MOLTEN CARBONATE FUEL CELL (MCFC).

A type of fuel cell consisting of a molten electrolyte of $\text{Li}_2\text{CO}_3/\text{Na}_2\text{CO}_3$ in which the species CO_3^{2-} is transported from the cathode to the anode. Operating temperatures are typically near 650 °C.



MONOLITHIC CELLS.

See RATED POWER OUTPUT.

NAPHTHA.

An artificially produced petroleum or coal tar fraction with a volatility between gasoline and kerosene.

NATURAL GAS.

A naturally occurring gaseous mixture of simple hydrocarbon components (primarily methane) used as a fuel for the production of electrical power.

NERNST POTENTIAL .

An electrode potential corresponding to the reversible equilibrium between hydrogen gas at a certain pressure and the corresponding level of hydrogen ion activity.

NET POWER.

The difference between the power flowing from a power source and power flowing back to the source due to cumulative circuit losses and current flowing from other interconnected current sources.

NOMINAL CAPACITY.

A capacity used for general rating/specification purposes. The actual capacity of a specific unit will be approximately the same as the nominal capacity but need not be exactly the same.

OPEN CIRCUIT VOLTAGE.

The voltage at device terminals when no appreciable current is flowing. Also known as NO-LOAD VOLTAGE.

OPERATION.

Grid-Connected. Operation of the power plant while electrically connected to a utility grid.

Grid-Independent. Operation of the power plant while electrically isolated from a utility grid.

OPERATING PRESSURE.

The variable pressure at which a system operates in response to changes in various operating conditions.

OPERATING PRESSURE, MAXIMUM.

The steady-state gauge pressure at which a part or system normally operates. It shall not exceed the allowable working pressure, and it is usually kept at a suitable level below the setting of pressure-limiting/relieving devices to prevent their frequent functioning.

ORIFICE.

The opening in an orifice cap, orifice spud or other device whereby the flow of gas is limited and through which the gas is discharged.

ORIFICE CAP (HOOD).

A movable fitting, having an orifice which permits adjustment of the flow of gas by changing its position with respect to a fixed needle or other device.

ORIFICE SPUD.

A removable plug or cap containing an orifice which permits adjustment of the flow of gas either by substitution of a spud with a different size orifice or by motion of a needle with respect to it.

OUTPUT VOLTAGE.

The fundamental rms. (root mean square) voltage between the output terminals.

OVERVOLTAGE.

A voltage above the normal rated voltage or the maximum operating voltage of a device.

OXIDANT UTILIZATION.

OXYGEN-TO-CARBON RATIO.

PARTIAL OXIDATION.

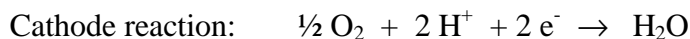
PARTIAL OXIDATION BURNER.

PASSIVE STATE.

A state for the fuel cell internal components normally entered when the power plant is purged with steam, air or nitrogen, or per the manufacturer's instructions when the power plant is turned off or prior to when the power plant is turned on (initialization).

PHOSPHORIC ACID FUEL CELL (PAFC).

A type of fuel cell in which the electrolyte consists of concentrated phosphoric acid (H_3PO_4) and protons (H^+) are transported from the anode to the cathode. The operating temperature range is generally 160 – 220 °C .



PILOT.

A small gas flame used to ignite the gas at the main burner.

Continuous. A pilot that burns without turndown throughout the entire time the burner is in service, whether the main burner is firing or not.

Expanding. A continuous pilot that is automatically expanded so as to reliably ignites the main burner. This pilot may be turned down at the end of the main burner flame-establishing period.

Intermittent. A pilot which is automatically lighted each time there is a signal for initialization. It burns during the entire period that the main burner is firing.

Interrupted. A pilot which is automatically lighted each time there is a signal for initialization. The pilot fuel is cut off automatically at the end of the main burner flame-establishing period.

Proved. A pilot flame supervised by a primary safety control.

PIPELINE GAS.

Proved. A pilot flame supervised by a primary safety control.

PIPING.

Either pipe or tubing, or both.

Pipe. Rigid conduit of iron, steel, copper, brass, aluminum, or plastic.

Tubing. Semi-rigid conduit of steel, copper, aluminum or plastic.

PIPING SYSTEM.

All piping' valves and fittings used to connect gas utilization equipment to the point of delivery.

PLANAR CELLS.

PLANT FOOTPRINT.

PLANT HEAT RATE.

POLARIZATION CURVE.

Typically a plot of fuel cell voltage as a function of current density (V vs. A/cm^2 or similar units). The curve is obtained under [standard conditions](#) so that fuel cell performance can be compared between different cell designs, and may be obtained by either a [single cell](#) or a stack test.

PORT.

Any opening in a burner head through which gas or gas-air mixture is discharged for ignition.

POWER.

Real. (ACTIVE USEFUL) For sinusoidal quantities in a two-wire circuit; the product of the voltage, the current, and the cosine of the phase angle between them. In a polyphase circuit; the sum of the active powers of the individual phases.

Reactive. For sinusoidal quantities in a two-wire circuit; the product of the voltage, the current, and the sine of the phase angle between them. In a polyphase circuit; the sum of the reactive powers of the phases.

Apparent. The square root of the sum of the squares of the active and the reactive powers.

POWER CONDITIONING.

The subsystem that converts the dc power from the (fuel cell) stack subsystem to ac power that is compatible with system requirements.

POWER DENSITY. (kW/liter).

In the context of a single cell, the power density is often measured in terms of power/unit area of active cell, e.g., kW/sq.m.; in the context of a complete cell stack, the power density could also be defined in terms of power/unit stack volume, e.g., kW/m³.

POWER FACTOR.

The ratio of the total active power in watts to the total apparent power in volt-amperes (the product of root-mean-square (rms.) voltage and rms. current).

Leading. A designation of the relative instantaneous direction of the currents to the voltages (angle is 0 to -90°).

Lagging. A designation of the relative instantaneous direction of the currents to the voltages (angle is 0 to $+90^\circ$)

POWER PLANT.

A packaged, self-contained, automatically operated assembly of integrated systems for generating useful electrical energy and recoverable thermal energy.

PREFERENTIAL OXIDATION.

PRESSURE.

The force exerted against an opposing body or the thrust distributed over a surface, expressed in weight per unit of area.

Absolute. The pressure above zero pressure, the sum of the atmospheric and gauge pressures.

Atmospheric (Standard). The pressure of the weight of air and water vapor on the surface of the earth at sea level, namely 29.92 inches (760 mm) mercury column or 14.69 pounds per square inch (101.3 kPa).

Barometric. The atmospheric pressure as determined by a barometer, usually expressed in inches (mm) of mercury.

Gauge. The pressure above atmospheric pressure.

Vacuum. Any pressure less than that exerted by the atmosphere.

PRESSURE GRADIENT MONITOR.

A device utilized to protect the quality of water, fail safe by design, which secures the potable water system by isolating the heat exchanger when the positive pressure gradient is less than ten (10) pounds per square inch (psi) (70 kPa) of the non-potable side.

PRESSURE (PRESSURIZED) VESSEL.

See VESSEL, PRESSURE.

PROGRAMMABLE CONTROLLER.

A digitally operating electronic system designed for use in an environment, which uses a programmable memory for the internal storage of user-oriented instructions for implementing specific functions such as logic, sequencing, timing, counting and arithmetic to control, through digital or analog inputs and outputs, various types of processes or machines.

PROPER VENTILATION. See VENTILATION, PROPER.

PROTON EXCHANGE MEMBRANE:

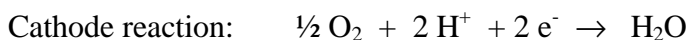
The separating layer in a PEM fuel cell which acts as an electrolyte (which is proton conducting) as well as a barrier film separating the hydrogen-rich feed in the cathode compartment of the cell from the oxygen-rich anode side.

PROTON EXCHANGE MEMBRANE (PEM).

A membrane with the ability to transport protons (H^+) from the anode to the cathode in a fuel cell.

PROTON EXCHANGE MEMBRANE FUEL CELL (PEMFC or PEFC).

A type of fuel cell in which the exchange of protons (H^+) from the anode to the cathode via a membrane is involved in the chemical reaction producing electricity. The electrolyte is a called a proton-exchange membrane (PEM). The fuel cells typically run at low temperatures (<100°C) and pressures (< 5 atm).



PURGE.

To free a gas conduit of air, gas or a mixture of air and gas.

RATED POWER.

The value stated on the generator nameplate. It is the power available at the output terminals of a component or piece of equipment that is operated in compliance with the manufacturer's performance specifications.

REACTION RATE.

A measure of the speed of a chemical reaction. The reaction rate depends on the rate constant, the number of reactants involved in the reaction and their concentration. For reactions that are otherwise slow, a [catalyst](#) is employed to increase the reaction rate.

REFORMER.

A vessel within which fuel gas and other gaseous recycle stream(s) (if present) are reacted with water vapor and heat, usually in the presence of a catalyst, to produce hydrogen rich gas for use within the fuel cell power plant.

REFORMATE GAS.

The fluid which exits the fuel reformer and acts as feed to the fuel cell stack.

REFORMING.

The thermal or catalytic conversion of petroleum naphtha into more volatile products with higher BTU ratings.

REGULATION CAPACITY, MAXIMUM.

The high limit of flow below which is found acceptable regulating characteristics.

REGULATOR, DRAFT.

A device which functions to maintain a desired draft in the equipment by automatically reducing the draft to the desired value.

REGULATOR, GAS PRESSURE.

A device for controlling a selected outlet gas pressure.

Adjustable.

Spring Type, Limited Adjustment. A regulator in which the regulating force acting upon the diaphragm is derived principally from a spring, the loading of which is adjustable over a range of not more than + 15 percent of the outlet pressure at the midpoint of the adjustment range.

Spring Type, Standard Adjustment. A regulator in which the regulating force acting upon the diaphragm is derived principally from a spring, the loading of which is adjustable. The adjustment means shall be concealed.

Convertible. A regulator for conversion between gases having different heating values whose adjustment means can be positioned from one predetermined outlet pressure setting for one gas to another predetermined outlet pressure setting for the other gas with no intermediate pressure settings and without addition, deletion or substitution of parts.

Multi-Rate. A standard adjustment regulator, the multi-rate adjustment means of which is not concealed and which provides nonfield adjustable high-pressure and low-pressure settings for high-low rates.

Nonadjustable.

Spring Type. A regulator in which the regulating force acting upon the diaphragm is derived principally from a spring, the loading of which is not adjustable.

Weight Type. A regulator in which the regulating force acting upon the diaphragm is derived from a weight or combination of weights.

REGULATOR, PRESSURE.

A device placed in a gas line for reducing, controlling and maintaining the pressure in that portion of the piping system downstream of the device.

RELIABILITY.

The ability of an item to perform a required function under stated conditions for a stated period of time.

RELIABILITY, ASSESSED.

The probability that a device will function without failure over a specified time period or amount of usage.

REVERSIBLE FUEL CELL.

A type of fuel cell in which the chemical reactants undergo reversible reactions, such that the cell may be recharged with a separate power source if desired. For example, the hydrogen/oxygen fuel cell may be recharged by providing power for water electrolysis with hydrogen storage. Also called Regenerative Fuel Cell.

RIPPLE CURRENT.

The undesirable AC (ripple) component of a pulsating DC current produced by a rectifier or similar power conditioning device.

ROTOR MEMBER, NONDISPLACEABLE.

A valve member which cannot be moved from its seat by a force applied to the valve handle, or force applied by a plane surface to any exterior portion of the valve.

RUPTURE MEMBER.

A device which will automatically rupture at a predetermined pressure.

SAFETY-CONTROL CIRCUIT.

See CIRCUIT, SAFETY-CONTROL.

SCHEDULED OUTAGE.

An outage that results when a power plant is deliberately taken out of service at a selected time, usually for the purposes of construction, maintenance or repair.

SCHEDULE OUTAGE DURATION.

The period from the initiation of a scheduled outage until construction, preventive maintenance, or repair work is completed and the affected component is made available to perform its intended function.

SELECTIVE OXIDATION.

SELF-CONTAINED.

Having all essential working parts, except energy and control connections, so contained in a case or framework that they do not depend on equipment or fastenings outside of the machine.

SEPARATOR PLATE.

SERIES CONNECTION.

SERVICE FACTOR.

A multiplier that, when applied to the rated power, indicates a permissible power loading that may be carried under the conditions specified for service factor.

SHIELD, RADIATION.

A separate panel or panels interposed between surfaces and jackets to reduce heat losses through radiation.

SHIFT CONVERSION.

SHUT-DOWN.

SHUTDOWN, SAFETY.

The action of shutting off all fuel and ignition energy to the gas utilization equipment by means of a safety control or controls such that restart cannot be accomplished without manual reset.

SHUTOFF DEVICE, SAFETY.

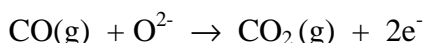
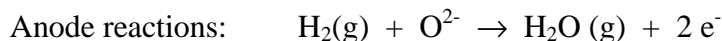
A device that will shut off the gas supply to the controlled burner in the event the source of ignition fails. This device may interrupt the flow of gas to the main burner only, or to the pilot and main burner under its supervision.

SINGLE CELL TEST.

A test of the fuel cell performance based on one unit cell. The test is typically a laboratory-scale test in which several variables can be adjusted in order to obtain data over a wide range of conditions, such as temperature, current density, fuel and oxidant flow rates, etc. The outcome of a single cell test may be a polarization curve, a voltage stability plot, or other data related to fuel cell performance.

SOLID OXIDE FUEL CELL (SOFC).

A type of fuel cell in which the electrolyte is a solid, nonporous metal oxide, typically ZrO_2 doped with Y_2O_3 , and O^{2-} is transported from the cathode to the anode. Any carbon monoxide (CO) in the reformat gas is oxidized to carbon dioxide (CO_2) at the anode. Temperatures of operation are typically 800 – 1000 °C.



SOUND LEVEL.

The sound pressure level (in decibels) at a point in a sound field, averaged over the audible frequency range and over a time interval, with a frequency weighting and time interval specified by the American National Standard Association.

SPECIFIC GRAVITY.

The ratio of the weight or mass of a given volume of a substance to that of an equal volume of another substance (air for gases, water for liquids and solids) used as a standard, both measured under the same conditions.

SPECIFIC POWER. (kW/kg)

STACK END FRAME.

STACK LIFE.

STACK TEST.

STACK VOLTAGE.

STACKING.

STANDARD ATMOSPHERE

STANDARD CONDITIONS.

The test or operating conditions that have been predetermined to be the basis of the test in order to have reproducible, comparable sets of test data. Typical conditions which are standardized are fuel and oxidant flow rates and ratios, temperature, pressure, electrode area, [catalyst loading](#), etc.

STANDBY.

A power circuit equipment, device, or component available to be connected into the circuit to perform a function when the preferred component has failed or is inoperative.

STANDBY POWER.

An independent reserve source of electric energy that upon failure or outage of the normal source, allows the user's facilities to continue in satisfactory operation.

STATIONARY PLANTS.

STEAM BOTTOMING CYCLE.

STEAM REFORMING.

STEAM-TO-CARBON RATIO.

STOP.

A fixed point on a control, such as a temperature limit control, which prevents the adjustment of the control beyond the stop point.

STOP, FIXED.

A stop that cannot be changed without the use of special tools.

STRENGTH, ULTIMATE.

The height stress level which a pressure-bearing part can tolerate without rupture, fracture, deformation or other physical damage.

SUBSTACK.

SUBSTANCES.

As applied to this standard, substances include, but are not limited to, solutions, lubricants, adhesives, sealants, etc.

SYNCHRONIZATION.

Operation at which a power plant is electrically connected and controlled to operate at the same frequency & voltages, and where the phase-angle displacements between voltages in them are constants or vary about steady and stable average values.

TEMPERATURE.

A measure of heat intensity.

Absolute. The temperature above absolute zero, or temperature plus 273°C or 459°F.

Ambient. The temperature of the surrounding medium, usually used to refer to the temperature of the air in which a structure is situated or a device operates.

THERMAL EFFICIENCY.

THERMOSTAT.

An automatic control device actuated by temperature and designed to be responsive to temperature.

THERMAL MANAGEMENT.

THREE-PHASE THREE WIRE SYSTEM.

A system of alternating-current supply comprising three conductors between successive pairs of which are maintained alternating differences of potential successively displaced in phase by one-third of a period.

THREE-PHASE FOUR WIRE SYSTEM.

A system of alternating-current supply comprising four conductors, three of which are connected as in three-phase three-wire system, the fourth being connected to the neutral point of the supply, which may be grounded.

TIMER, WATCHDOG.

A device which detects computer malfunction and initiates independent action to safely deactivate the equipment operated by the failed computer. The device accomplishes failure detection, by monitoring a periodic update signal from the computer, and activation, if this periodic signal does not occur within a specified time period.

TOTAL HARMONIC DISTORTION (THD).

The ratio of the root-mean-square (RMS.) value of the sum of the squared individual harmonic amplitudes to the rms. value of the fundamental frequency of a complete waveform.

TRANSPORTATION.

TUBULAR CELLS.

TURBOCHARGER.

A device used for increasing the pressure and density of a fluid entering a fuel cell power plant using a compressor driven by a turbine which extracts energy from the exhaust gas.

TURBOCOMPRESSOR.

TURBOCOMPRESSION.

TURBOEXPANDER.

ULTRA-LOW EMISSION VEHICLE (ULEV).

VALVE.

A device used in piping to control the gas supply to any section of a system of piping or to gas utilization equipment.

Automatic. A device consisting essentially of a valve and operator that controls the gas supply to the burner during normal operation of the equipment. The operator may be actuated by application of gas pressure on a flexible diaphragm, by electrical means, by mechanical means or by other means.

Diaphragm Type. A device consisting essentially of an automatic valve actuated by means of the application of gas pressure upon a flexible diaphragm.

Electric Type. A device actuated by electrical energy for controlling the gas supply. These consist of the following:

Modulating. A valve designed so the valve opening is controlled within narrow limits through the entire range from the "full opens to the "closed" position.

Motor. An electric control valve which is automatically closed by a spring or other mechanical means in the event the electric circuit is broken.

Solenoid. A valve that is opened or closed by the action of an electrically-excited coiled wire magnet upon a bar of steel attached to the valve disc.

Step (Manual). A valve having a rotating plug with, generally, three or more positions and different rates of gas flow for each, the plug being actuated by a solenoid or motor-driven rack and pinion and a cam arrangement which, together with a combination push-button switch, determines the position assumed by the plug.

Burner. A manually or mechanically operated valve which permits control of the flow of gas.

Combustion (input) Control. An automatic control valve for regulating gas input.

Latching Type. A manual gas valve which requires at least two separate actions or movements to turn on the valve, as for example, pushing in on the valve handle to unlatch the valve before the valve handle can be rotated to turn on the gas.

Lubricated Plug. A valve of the plug-and-barrel type which has bearing surfaces designed to be re-lubricated without disassembly of the valve.

Main Burner, Individual. A valve which controls the gas supply to an individual main burner.

Semi-Automatic. A valve that is opened manually and closed automatically, or vice versa.

Shutoff, Manual. A manually operated valve in a fuel line for the purpose of completely turning on or shutting off the fuel supply to gas utilization equipment.

Shutoff, Manual Main. A manually operated valve in the gas line for the purpose of completely turning on or shutting off the gas supply to gas utilization equipment, except to a pilot provided with independent shutoff valves.

Shutoff, Safety. A valve that is automatically closed by the safety control system or by an emergency device. Such valve may be of the automatic or manually opened type.

VALVE, CONTROL.

A valve used to control the flow of any medium.

VALVE, OPERATING.

An operating valve is an automatic valve controlled by an operating control.

VALVE, RELIEF.

A safety valve designed to forestall the development of a dangerous condition by relieving either pressure, temperature or vacuum in a hot water supply system.

Pressure. A valve which automatically opens and closes a relief vent, depending on whether the pressure is above or below a predetermined value.

Temperature. A valve which automatically opens and closes a relief vent, depending on whether the temperature is above or below a predetermined value.

Vacuum. A valve which automatically opens and closes a vent for relieving a vacuum within the hot water supply system, depending on whether the vacuum is above or below a predetermined value.

VAR.

A unit of reactive power in a circuit carrying a sinusoidal current. A VAR equals the amount of reactive power in the circuit when the product of the root-mean-square value of the voltage (volts) by the root-mean value of the current (amps) and the sine of the phase angle between the voltage and the current, equals 1.

VENT.

A passageway or conduit for conveying products of combustion from gas utilization equipment, or their vent connectors, to the outside atmosphere.

VENT CONNECTOR.

That portion of the venting system which connects the flue outlet of gas utilization equipment to the gas vent or single-wall metal pipe.

VENT GASES.

Products of combustion from gas utilization equipment plus excess air, plus dilution air in the venting system above the draft regulator or similar device.

VENT LIMITER.

A means which limits the flow of air from the atmospheric diaphragm chamber of a gas pressure regulator to the atmosphere. This may be either a limiting orifice or a limiting device.

VENT TERMINAL (VENT CAP).

The tating at the end of the vent pipe that directs the flue products into the outside atmosphere.

VENTILATION.

The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from any space.

VENTILATION, PROPER.

In general, the dilution of a flammable gas/vapor with air to a point safely below its lower explosive limit (LEL). As applied to this standard, a sufficient or adequate supply of fresh air and proper exhaust to outdoors or to a safe location with a sufficiently-vigorous and properly-distributed air circulation to ensure that the flammable gas/vapor concentration in all parts of the enclosure will be below 25 percent of the LEL at all times.

VENTING SYSTEM.

The gas vent or single-wall metal pipe, and vent connector if used, assembled to form a continuous open passageway from the flue collar of gas utilization equipment to the outside atmosphere for the purpose of removing vent gases.

VESSEL, PRESSURE.

Containers for the containment of pressure either internal or external. This pressure may be obtained from an external source, or by the application of heat from a direct or indirect source, or by any combination thereof. Exceptions: vessels having an internal or external operating pressure not exceeding 15 psi (103.4 kPa) with no limitation on size; vessels having an inside diameter, width, height or cross section diagonal not exceeding six (6) inches (152 mm) with no limitation on length of vessel or pressure.

Fired. A vessel containing a fluid under pressure exposed to heat from the combustion of fuel gas, reformer gas or combustible gas derived from fuel gas or from electricity.

Unfired. A vessel designed to withstand internal pressure, neither subjected to heat from products of combustion nor an integral part of a fired pressure vessel system.

VESSEL, UNPRESSURIZED.

A vessel for containment of fluids not subject to the definition of PRESSURE VESSEL.

VOLTAGE, HARMONIC.

A voltage whose frequency is a multiple of the fundamental frequency.

WORKING PRESSURE, ALLOWABLE.

The maximum gauge pressure at which a part or system may be operated in accordance with the provisions of this standard. It is the pressure used in determining the setting of pressure-limiting/relieving devices installed to protect the part or system from accidental over-pressuring.

ZERO ELECTRIC VEHICLE (ZEV).

Endnotes:

¹ Denotes definitions derived from ANSI Z21. 83/(GA12.10) and, while relevant with that standard, do not necessarily apply to a fuel cell power plant.