

## A

**Absolute Pressure (abs press)** - Gauge pressure plus barometric pressure. Absolute pressure can be zero only in a perfect vacuum.

**Absolute Viscosity (abs visc)** - The product of fluid kinematic viscosity times its density. Absolute viscosity is a measure of fluid tendency to resist flow, without regard to its density. Sometimes the term dynamic viscosity is used in place of absolute viscosity. Refer to Viscosity, Absolute.

**Accuracy** - A measure of how close a regulator can keep downstream pressure ( $P_2$ ) to the setpoint. Regulator accuracy is expressed as percent droop or proportional band or offset in percent of setpoint or in units of pressure.

**ACFH** - Actual Cubic Feet per Hour. The actual volume of fluid measured by the meter. This is not SCFH (standard cubic feet per hour).

**Active/Working Regulator** - A regulator that is in service performing a control function.

**Adjusting Screw** - A screw used to change the compression setting of a loading spring.

**AGA** - The American Gas Association or Australian Gas Association.

**Airsets** - See Filter/Supply Regulators.

**ALPGA** - Australian Liquefied Petroleum Gas Association, Ltd.

**ANSI** - American National Standards Institute.

**API** - American Petroleum Institute.

**Appliance (Equipment)** - Any device that uses gas as a fuel or raw material to produce light, heat, power, refrigeration, or air conditioning.

**ASME** - American Society of Mechanical Engineers.

**Aspirator** - Any device using fluid velocity effect to produce a low-pressure zone. Used in regulator control and combustion systems.

**Atmospheric Pressure** - The pressure exerted by the atmosphere at a given location and time. Sea level pressure is approximately 14.7 pounds per square inch absolute (1.0 bar absolute).

**Automatic Control System** - A control system that operates without human intervention.

**Automatic Cutoff** - A device used on some regulators to close the main valve in the event of pressure deviation outside of a preset range. Must be reopened manually.

## B

**Backpressure Regulator** - This is a device that controls and responds to changes in its upstream/inlet pressure. Functions the same as a relief valve in that it opens on increasing upstream pressure.

**Barometer** - An instrument for measuring atmospheric pressure, usually in inches, centimeters, or millimeters of mercury column.

**Barometric Pressure** - The atmospheric pressure at a specific place according to the current reading of a barometer.

**Bellows** - A flexible, thin-walled cylinder made up of corrugations one next to the other that can expand or contract under changing pressures.

**Bimetallic Thermal System** - A device working on the difference in coefficient of expansion between two metals to produce the power to position a valve plug in response to temperature change.

**Bleed** - Removal of fluid from a higher pressure area to a lower pressure area in a regulator pilot system.

**Bode Diagram** - A plot of log amplitude ratio and phase values on a log frequency base for a transfer function. (It is a common form of graphically presenting frequency response data.)

**Body** - Pressure retaining shell enclosing the restricting element.

**Boiler** - A closed vessel in which a liquid is heated or vaporized.

**Bonnet** - The regulator component that connects the valve body to the actuator.

# GLOSSARY OF TERMS

**Boost** - The increase in control pressure above setpoint as flow is increased from low flow to maximum flow. Some regulators exhibit droop instead of boost.

**British Thermal Unit (BTU)** - The quantity of heat required to raise one pound of water from 59° to 60°F.

**Build-up** - In a relief valve, the pressure increase above setpoint required to produce a given flow rate.

**BSPT** - British Standard Pipe Thread.

## C

**C<sub>1</sub>** - A term used in a sizing equation. It is defined as the ratio of the gas sizing coefficient and the liquid sizing coefficient and provides a numerical indicator of the valve's recovery capabilities.

**Cage** - A hollow, cylindrical trim element that is a guide to align the movement of a valve plug with a seat ring and/or retains the seat ring in the valve body. The walls of the cage contain openings that usually determine the flow characteristic of the control valve.

**Capacity, Flow** - The amount of a specified fluid that will flow through a valve, specific length and configuration of tubing, a manifold, fitting, or other component at a specified pressure drop in a fixed period of time. (SCFH, gpm, Nm<sup>3</sup>/h, Lpm, bph).

**Capacity, Rated** - The rate of flow through the regulator specified by the manufacturer for a given inlet pressure, outlet pressure, offset, and size.

**Capacity, Wide-Open** - If a wide-open failure occurs, this is the amount a regulator will flow.

**Cavitation** - A phenomenon whereby liquid flowing through a valve under reduced pressure will form gaseous bubbles that will collapse upon pressure recovery, producing potential trim damage. This is a concern when high-pressure drops exist across the valve.

**Centipoise** - A unit for measurement of absolute viscosity. One centipoise is equal to one hundredth of a poise, the metric (cgs) unit of absolute viscosity. The absolute viscosity of water at 20°C is approximately one centipoise.

**Centistoke** - A unit for measurement of kinematic viscosity. One centistoke is equal to one hundredth of a stoke, the metric (cgs) unit of kinematic viscosity. The kinematic viscosity in centistokes times the density equals the absolute viscosity in centipoises.

**CFH** - Cubic Feet per Hour (ft<sup>3</sup>/h). Volumetric measurement of gas flow per hour, generally at line conditions.

**C<sub>g</sub> (Flow Coefficient)** - A term used in gas and steam valve sizing equations. The value of C<sub>g</sub> is proportional to flow rate and is used to predict flow based on physical size or flow area.

**CGA** - Canadian Gas Association.

**Coal/Coke Oven Gas** - A gas with a high sulfur content that is produced from baking coal. It may also contain tar that can cause sticking in moving parts of a regulator. Regulators with brass or copper parts should not be used with this gas. Often this gas requires the use of fluoroelastomers.

**Compressibility Effect** - The change in density of gas or air under conditions of compression.

**Compression (Spring)** - The action on a spring which decreases its length relative to the force to which it is subjected.

**Condensate** - The liquid resulting when a vapor is cooled and/or when its pressure is increased.

**Control Line** - The external piping which connects the regulator actuator or pilot to the point on the main line where control is required.

**Control Valve** - A mechanically, electrically, or hydraulically operated valve, using an external power source to effect its operation, that modifies the fluid flow characteristics in a process. It consists of a valve connected to an actuator mechanism that is capable of changing the position of the flow controlling element or closure member in the valve in response to a signal from the controlling device.

**Controller** - A device that operates automatically to regulate a controlled variable.

**Critical Flow** - The rate at which a fluid flows through an orifice when the stream velocity at the orifice is equal to the velocity of sound in the fluid. Under such conditions, the rate of flow may be increased by an increase in upstream pressure, but it will not be affected by a decrease in downstream pressure. Critical flow occurs when P<sub>2</sub> is approximately 1/2 of P<sub>1</sub> absolute.

**Critical Velocity** - The velocity at critical flow. Also called sonic velocity.

**CSA** - Canadian Standards Association.

**C<sub>s</sub> (Flow Coefficient)** - Steam valve sizing coefficient. At pressures below 1000 psig, a constant relationship exists between the gas sizing coefficient (C<sub>g</sub>) and the steam coefficient (C<sub>s</sub>). This relationship is expressed:  $C_s = C_g \div 20$ .

**C<sub>v</sub> (Flow Coefficient)** - Liquid sizing coefficient. It is numerically equal to the number of U.S. Gallons of water at 60°F that will flow through the valve in one minute when the pressure differential across the valve is one pound per square inch.

## D

**Dead Band** - The range through which an input can be varied without initiating observable response.

**Delta P (DP) (ΔP) (Pressure Drop)** - The difference between the inlet and outlet pressures.

**Demand** - The rate at which fluid is delivered to or required by a system, part of a system, or a piece of equipment, usually expressed in terms of volume per unit of time.

**Density** - The weight of a unit volume of a substance. Also called specific weight.

**Diaphragm** - A flexible membrane used in a regulator or relief valve to sense changes in downstream pressure and respond to them, thus moving the restricting element or closure member to which it is attached.

**Diaphragm Actuated Regulator** - A regulator utilizing a diaphragm and actuator to position the valve plug.

**Diaphragm Case** - A housing used for supporting a diaphragm and establishing one or two pressure chambers.

**Diaphragm Effect** - The change in effective area of the diaphragm as the regulator strokes from low to high flow.

**Diaphragm Plate** - A plate used to transmit force in conjunction with a diaphragm and fluid pressure on a spring to the actuator stem or pusher post.

**Differential Pressure** - The difference in pressure between two points in a system.

**Differential Pressure Regulator** - A device that maintains a constant differential pressure between a reference pressure and the pressure of the controlled fluid.

**Digester Gas** - A gas produced by sewage treatment plants. This gas is used to power burners and engines. Because of its high methane content, stainless steel construction might be required.

**Disk** - A movable part that is positioned in the flow path to modify the rate of flow through the valve. It is often made of an elastomer material to improve shutoff capability.

**Downstream** - Any site beyond a reference point (often a valve or regulator) in the direction of fluid flow.

**Drift** - A change in setpoint over an extended period of time.

**Droop** - The amount a regulator deviates below its setpoint as flow increases. Some regulators exhibit boost instead of droop.

**DVGW** - Deutscher Verein des Gas- und Wasserfaches e.v. (German approval agency).

**Dynamic Unbalance** - The force exerted on a valve plug when fluid is flowing through the valve.

## E

**Effective Area** - In a diaphragm actuator, the part of the diaphragm area that generates operating force. The effective area is less than the total area. (The effective area of a diaphragm might change as it is stroked, usually being a maximum at the start and a minimum at the end of the travel range. Molded diaphragms have less change in effective area than flat-sheet diaphragms.)

**End Connection** - The style of joint used to make a pressure tight connection between the valve body and the pipeline.

**Entropy** - A thermodynamic quantity that measures the fraction of the total energy of a system that is not available for doing work.

# GLOSSARY OF TERMS

**Enthalpy** - Total heat content, expressed in BTU per pound, above an arbitrary set of conditions chosen as the base or zero point.

**External Pressure Registration** - A regulator with a control line. The actuator pressure is isolated from the body outlet pressure within the regulator.

**External Static Line** - The same as control line.

## F

**Face-to-Face Dimension** - The dimension from the face of the inlet opening to the face of the outlet opening of the regulator.

**Fail-Closed** - In the event of a regulator failure, a condition wherein the valve port remains closed. All regulators can fail open or closed.

**Fail-Open** - In the event of a regulator failure, a condition wherein the valve port remains open. All regulators can fail open or closed.

**Filter/Supply Regulators** - Pressure reducing regulators used in air service to simultaneously filter and reduce pressure. Used to supply process control instruments pneumatic power. Also called airsets.

**First-Stage Regulator** - A regulator used to reduce inlet pressure to a set value being fed to another regulator in series.

**Fixed Factor Measurement** - The measurement of gas at a controlled elevated pressure without the use of an automatic correcting device to correct the volume for variation from base or contract pressure. This is accomplished by placing an accurate regulator upstream of the meter. Also known as PFM (Pressure Factor Measurement).

**Fixed Restriction** - A small diameter hole in the pilot or piloting system that determines gain.

**Flange** - End connections of regulator valve bodies used for bolting onto another fitting or pipe element.

**Flange Facing** - The finish on the end connection of valves.

**Flashing** - A condition when liquid changes to the vapor state caused by pressure reduction inside a valve.

**Flow Capacity** - The rated flow through a regulator under stated inlet, outlet, and droop pressures.

**Flow Characteristic** - Relationship between flow through the valve and percent rated travel.

**Flow Coefficient** - See  $C_v$ ,  $C_s$ ,  $C_g$ ,  $C_1$ .

**Flow Rate** - The amount (mass, weight, or volume) of fluid flowing through a valve body per unit of time.

**Fluid** - Materials in a liquid, gas, or vapor state, as opposed to a solid.

**Fuel Gas** - A commonly distributed gas used for fuel, such as natural gas, propane, landfill gas, etc.

**Full Capacity Relief** - A relief valve that has the capability of maintaining downstream pressure to within certain limits in the event of some type of failure, by venting the excess gas to the atmosphere.

## G

**Gage Pressure** - (Psig or bar g) The difference between atmospheric pressure and the pressure being measured. Also written gauge pressure.

**Gas** - That state of matter which expands to fill the entire container which holds it. Gas is one of the forms of matter (solid, liquid, and gas).

**Gas Utilization Equipment** - Any device which utilizes gas as a fuel or raw material, or both.

**Gauge Pressure** - Pressure reading as shown on a gauge (psig or bar g). The difference between atmospheric pressure and the pressure the gauge is measuring. Also written gage pressure.

**Gauge, Pressure** - An instrument that measures the pressure of a fluid.

**Governor** - An attachment to a machine for automatic control or limitation of speed. Also, an archaic term used for a low-pressure, direct-operated, pressure reducing gas regulator.

## H

**Hard Facing** - A material harder than the surface to which it is applied. Used to resist galling or fluid erosion.

**Header** - A piping configuration where a number of pipes are combined at one location.

**Hunting** - A condition in which a regulator's outlet pressure slowly fluctuates on either side of a setpoint.

**Hysteresis** - A deviation from setpoint caused by friction and parts clearance.

## I

**Impulse Line** - See control line.

**Inch of Water** - A unit of pressure measurement. The pressure required to support a column of water one inch high. Typically reported as inches w.c. (water column); 27.68-inches of water is equal to one pound per square inch (psi).

**Inlet Pressure** - The pressure at the inlet opening of a valve ( $P_1$ ).

**Inlet Pressure Sensitivity** - The increase or decrease in the outlet pressure caused by changes in the inlet pressure which results in differing degrees of force being applied to the seat disk and diaphragm.

**Internal Relief Valve** - A small, spring-loaded pressure relief valve contained within the regulator at the center of the diaphragm to prevent outlet pressure from exceeding a predetermined pressure.

**Isolation Valve** - Refer to Valve, Isolation.

**I/O** - Input/Output -- Electrical inputs and electrical outputs.

## J - K - L

**$K_m$**  - Value recovery coefficient - used in liquid sizing equations to determine  $\Delta P$  allowable for cavitation.

**Kinematic Viscosity (kin visc)** - The relative tendency of fluids to resist flow. The value of the kinematic viscosity includes the effect of the density of the fluid. The kinematic viscosity is equal to the absolute viscosity divided by the density. Refer to Viscosity, Kinematic.

**LCD** - Liquid crystal display; readout panel which displays alphanumeric sequences in digital format.

**Landfill Gas** - A gas produced by decaying organic matter in a garbage landfill. This gas is used to power burners and engines. This gas has a high methane content and may contain other gases; therefore, stainless steel construction is usually required.

**Liquid Expansion Thermal System** - A closed system containing liquid whose expansion and contraction in response to temperature changes provides the power to position a valve member.

**Liquefied Petroleum Gas (LPG)** - Butane, propane, or a mixture of the two, obtained from oil or gas wells, or as a by-product from the refining of gasoline. It is sold in metal bottles under pressure as a liquid; hence, sometimes called bottled gas.

**Loading Element** - In a regulator, the means for placing a measured amount of force against the regulator's diaphragm. The loading element is commonly a spring.

**Loading Pressure** - The pressure employed to position a pneumatic actuator. (This is the pressure that actually works on the actuator diaphragm or piston to change the position of the valve plug.)

**Lockup Pressure** - Increase over setpoint when the regulator is at no-flow condition.

## M

**Maximum Allowable Operating Pressure (MAOP)** - The maximum pressure that the system may be operated at as determined by its components, taking into account function and a factor of safety based on yield of parts or fracture.

**Maximum Operating Pressure** - The maximum pressure existing in a piping system during normal operation.

**Measuring Element** - A diaphragm that senses (measures) changes in downstream pressure and causes the regulator restricting element to move toward the open or closed position.

**Meters Cubed per Hour (Normal or Standard)** - Refer to Nm<sup>3</sup>/h or Sm<sup>3</sup>/h.

**Minimum Controllable Flow** - The lowest flow at which a steady regulated condition of the controlled variable can be maintained.

**Modbus** - Protocol used for communications between electronic devices developed by Gould Modicon.

## N - O

**NACE** - National Association of Corrosion Engineers

**Natural Gas** - A hydrocarbon gas consisting mainly of methane.

**Needle Valve** - Refer to Valve, Needle.

**Nm<sup>3</sup>/h** - meters cubed per hour (normal); measurement of volume rate of a gas at atmospheric pressure and 0°C. Also refer to Sm<sup>3</sup>/h.

**NPT** - National Pipe Thread, a standard for tapered thread used on pipes and pipe fittings.

**Offset** - The deviation from setpoint for a given flow. Negative offset is equivalent to droop.

**Operating Pressure** - The actual pressure at which a device operates under normal conditions. This pressure may be positive or negative with respect to atmospheric pressure.

**Orifice** - A fixed opening, normally the inside diameter of a seat ring, through which fluid passes. The term can also refer to the inlet or outlet of a regulator or pilot valve. Also called a port.

**Outlet Pressure (Reduced Pressure)** - The pressure leaving the outlet opening of a valve (P<sub>2</sub>).

**Over-Pressure Cut-Off Device** - A mechanical device incorporated in a gas pipework system to shutoff the supply of gas when the pressure at the sensing point rises to a predetermined value.

## P

**P<sub>1</sub>** - Inlet or upstream pressure.

**P<sub>2</sub>** - Outlet or downstream pressure.

**PFM (Pressure Factor Measurement)** - The measurement of gas at a controlled elevated pressure without the use of an automatic correcting device to correct the volume for variation from base or contract pressure. This is accomplished by placing an accurate regulator upstream of the meter. Also known as Fixed Factor Measurement

**PID** - Proportional/Integral/Derivative device. Usually used as a controller.

**Pilot (Amplifier)** - A relatively small controlling regulator that operates the main regulator. They are used to increase accuracy.

**Piston Actuated Regulator** - A regulator utilizing a piston rather than a diaphragm actuator.

**Pitot Tube** - A hollow tube that connects the area beneath the regulator diaphragm with the vena contracta area of gas flow. The pitot tube causes the diaphragm to sense a pressure lower than that which exists downstream of the regulator, and thus allows the regulator to open more for any given change in downstream pressure. The result is increased regulator accuracy.

**P<sub>L</sub>** - Loading pressure. Pressure of fluid on the main diaphragm that is controlled by a pilot regulator.

**Plug** - Piece that throttles against an orifice to increase and decrease flow.

**Poise** - A metric unit for measuring absolute viscosity. One poise equals one dynesecond per square centimeter, or one gram per centimeter second.

**Port** - A fixed opening, normally the inside diameter of a seat ring, through which fluid passes. The term can also refer to the inlet or outlet of a regulator or pilot valve. Also called an orifice.

**Powder Paint Coating** - A paint process that uses dry powder with no solvents for surface finish. Dry powder can be reused, thereby reducing waste and pollutants. The powder coating over a clean surface provides better corrosion resistance than liquid coat.

**Pressure** - Force per unit area.

**Pressure Buildup** - In a relief valve, the pressure increase above setpoint required to produce a given flow rate.

**Pressure Differential** - The difference in pressure between two points in a system.

**Pressure Drop** - The difference between the inlet and outlet pressures.

**Pressure Reducing Regulator** - A valve that satisfies downstream demand while maintaining a constant reduced pressure. As the pressure decreases, the valve opens to increase flow.

**Pressure Relief Valve** - A valve that opens and closes to ensure that pressure does not rise above a predetermined value.

**Propane** - An easily liquefiable hydrocarbon gas. Propane is one of the components of raw natural gas, and it is also derived from petroleum refining processes. Its chemical formula is C<sub>3</sub>H<sub>8</sub>.

**Proportional Band (Amount of Deviation)** - The amount a regulator deviates from setpoint as the flow increases from minimum to maximum. Also referred to as droop or offset.

**psia - pounds per square inch, absolute** - The pressure above a perfect vacuum, calculated from the sum of the pressure gauge reading and the (local or ambient) atmospheric pressure (approximately 14.7).

**psid** - Pounds per square inch, differential.

**psig** - Pounds per square inch, gauge. The pressure above atmospheric pressure. Near sea level the atmospheric pressure is approximately 14.7 pounds per square inch.

## Q - R

**Range** - The region between the limits within which a quantity is measured, received, or transmitted, expressed by stating the lower and upper range values (Example: 3 to 15 psi; -40° to 212°F (-40° to 100°C)).

**Rangeability** - The ratio of maximum rated capacity to the minimum controllable flow within the specified accuracy band.

**Rate of Flow** - The volume of material passing a given point in a system per unit of time.

**Rated Working Pressure** - The maximum allowable pressure specified by the manufacturer.

**Reduced Pressure** - The pressure leaving the outlet opening of a valve (P<sub>2</sub>). More commonly called outlet pressure.

**Regulator, Direct-Operated** - See Pressure Reducing Regulator.

**Regulator, Pilot-Operated** - Two regulators connected so that one increases the effect of downstream pressure changes on the other. This arrangement is used to provide increased accuracy and flow capacity compared to direct-operated regulators.

**Relief Valve** - See Pressure Relief Valve.

**Relief Valve, Pilot-Operated** - Two relief valves connected so that one increases the effect of inlet pressure changes on the other. This arrangement is used to provide increased capacity and reduced buildup compared to other relief valve types.

**Relief Valve, Pop Type** - A spring-loaded poppet type relief valve.

**Repeatability** - The closeness of agreement of a regulated value when returned to the same steady-state conditions after upset(s).

# GLOSSARY OF TERMS

**Reseat Point** - In a relief/backpressure valve which is opened by an increase in inlet pressure, the point where the valve closes.

**Restricting Element** - The element that restricts and controls fluid flow in a system. In a regulator this element is typically a disk and orifice combination, or plug and cage assembly.

**RTD** - Resistance Temperature Detector. A resistance device used to measure temperature.

**RTU** - Remote Terminal Unit or Remote Telemetry Unit.

## S

**SAE Number Viscosity** - Refer to Viscosity, SAE Number.

**Saybolt Furol** - A scale used for measuring the viscosity of heavy oils. The instrument has a larger orifice and is used at a higher temperature than the Saybolt Universal instrument used for lighter oils.

**Saybolt Universal** - A scale used for measuring the viscosity of oil, expressed in seconds required for a specified amount of oil to flow through an orifice; hence, the larger the number of seconds, Saybolt Universal (SSU), the more viscous the oil.

**SCFH** - Standard cubic feet per hour. Volumetric gas measurement of flow per hour at standard or at base conditions.

**Seat** - The portion of the seat ring or valve body which a closure member contacts for shutoff.

**Seat Leakage** - Flow of fluid past a seat or seal when in the closed position.

**Seat Ring** - A separate piece inserted in a valve body to form a valve body port. It generally provides a seating surface for a plug or disk.

**Self-Contained Regulator** - Pressure control device that is powered by the process media pressure and does not require outside energy.

**Setpoint** - The pressure at which the regulator or relief valve is set to control.

**Set Pressure Range** - The range of pressures, specified by the manufacturer, within which the device can be adjusted.

**Sm<sup>3</sup>/h** - meters cubed per hour (standard); measurement of volume rate of a gas at atmospheric pressure and 60°F. Also refer to Nm<sup>3</sup>/h.

**Soft Seat** - An elastomeric, plastic, or other readily deformable material used either in the valve plug or seat ring to provide tight shutoff with minimal force.

**Sonic Velocity** - The speed of sound for a particular gas at a given inlet pressure and temperature.

**Sour Gas** - Gaseous fuel that contains a relatively large proportion of sulfur or sulfur compounds. See the discussion on Sulfide Stress Cracking in the Technical Section.

**Specific Gravity** - The ratio of weight of a given volume of fluid to the weight of an equal volume of liquid/gas at stated temperature.

**Speed of Response (Stroking Speed)** - The amount of time it takes the valve plug or disk to travel from completely closed to completely open (0 to 100%).

**Spring** - Part used as the loading element in a regulator. Length is adjusted to establish setpoint.

**Spring Adjustment Screw** - A screw used to compress the spring to establish the regulator setpoint.

**Spring Rate (K)** - Spring rate is defined by the amount of force required to compress a spring a given distance. Spring rate is given in force/length (for example, lbf/in).

**Stability** - The ability to hold a steady controlled variable within the limits of stated accuracy of regulation.

**Standard Atmosphere** - The accepted normal atmospheric pressure at sea level, equal to 14.696 pounds per square inch.

**Standard Barometer** - The reading of a barometer for standard atmospheric pressure; equal to 29.92 inches of mercury column.

**Standard Gravity** - Standard accepted value for the force of gravity. It is equal to the force which will produce an acceleration of 32.17 feet per second per second.

**Standard Pressure** - The same as standard atmosphere; equal to a pressure of 14.696 pounds per square inch.



**Static Line** - See Control Line.

**Static Pressure** - The pressure in a fluid at rest.

**Static Unbalance** - The force exerted on a valve plug due to fluid pressure in the non-flowing condition.

**Stoke** - The cgs unit of kinematic viscosity. One stoke equals one centimeter squared per second.

**Supercompressibility** - Many gases are more compressible under high pressure at ordinary temperatures than indicated by Boyle's Law. These gases, measured at the high pressures, will occupy a greater volume when the pressure is reduced to near atmospheric pressure.

**SUS (or SSU) Viscosity** - Refer to Viscosity, SUS (or SSU).

## \_\_\_\_\_ T - U \_\_\_\_\_

**Therm** - 100,000 BTU.

**Thermostat** - A device that automatically maintains a predetermined temperature in an appliance or component.

**Travel** - The amount of linear movement of the valve closure member from the closed position to the rated full-open position.

**Travel Indicator** - An external, visible device used to indicate the travel of the valve plug.

**Trim** - The replaceable internal parts of a regulator, usually made up of a seat ring or orifice, valve plug or disk and disk holder, and stem; other replaceable internal parts may be considered trim.

**Under-Pressure Cut-Off Device** - A mechanical device incorporated in a gas pipe work system to shutoff the supply of gas when the pressure at the sensing point falls to a predetermined figure.

## \_\_\_\_\_ V - W \_\_\_\_\_

**Vacuum Breaker** - A valve used to limit an increase in vacuum. An increase in vacuum (decrease in absolute pressure) beyond a certain value registers on the diaphragm. The valve disk will open permitting atmospheric, positive pressure, or an upstream vacuum that has a higher absolute pressure than the downstream vacuum, to enter the system and restore to setpoint.

**Vacuum Regulator** - A device that maintains a vacuum at a setpoint. A decrease in this vacuum (increase in absolute pressure) beyond this value registers underneath the diaphragm and opens the valve. This permits the downstream vacuum of lower absolute pressure than the upstream vacuum to restore the upstream vacuum to its original pressure setting.

**Valve** - A device used for the control of fluid. It consists of a fluid retaining assembly, one or more parts between end openings, and a movable closure member which opens, restricts, or closes the port(s).

**Valve Body** - A pressure retaining housing for internal parts having inlet and outlet flow connections.

**Valve Closure Member** - The movable part which is positioned in the flow path to modify the rate of flow through the valve, often made of an elastomer material to improve shutoff.

**Valve Linkage** - A lever or levers connecting the diaphragm to the valve plug or valve plug stem.

**Valve Plug** - A movable part which provides a variable restriction in a port.

**Valve, Needle** - A small, adjustable valve in which the position of a pointed plug or needle relative to an orifice or tapered orifice permits or restricts fluid flow.

**Valve, Isolation** - Simple valves located in the piping system used to isolate individual equipment. They are designed to be operable by hand and installed to be readily accessible to the consumer.

**VDC** - Volts direct current.

**Vena Contracta** - The location where cross-sectional area of the flow stream is at its minimum size, where fluid velocity is at its highest level, and fluid pressure is at its lowest level. (The vena contracta normally occurs just downstream of the actual physical restriction in a regulator.)

# GLOSSARY OF TERMS

**Vent** - An opening in the regulator spring case to allow atmospheric pressure access to the diaphragm, thus allowing free movement of the diaphragm during operation.

**Viscosity** - The tendency of a fluid to resist flow.

**Viscosity, Absolute** - The product of a fluid's kinematic viscosity times its density. Absolute viscosity is a measure of a fluid's tendency to resist flow, without regard to its density. Sometimes the term dynamic viscosity is used in place of absolute viscosity.

**Viscosity, Kinematic** - The relative tendency of fluids to resist flow. The value of the kinematic viscosity includes the effect of the density of the fluid. The kinematic viscosity is equal to the absolute viscosity divided by the density.

**Viscosity, SAE Number** - The Society of Automotive Engineers' arbitrary numbers for classifying fluids according to their viscosities. The numbers in no way indicate the viscosity index of fluids.

**Viscosity, SUS (or SSU)** - Saybolt Universal Seconds (SUS), which is the time in seconds for 60 milliliters of oil to flow through a standard orifice at a given temperature (ASTM Designation D88.56).

**Volume Corrected** - The volume metered times metering pressure plus atmospheric pressure/base pressure equals volume corrected.

**Water Column** - A unit of measurement. The pressure required to support a column of water one inch high. Typically reported as inches w.c. (water column); 27.68-inches of water is equal to one pound per square inch (psi).

**Weight, Specific** - The weight per unit volume of a substance. The same as density.

## \_\_\_\_\_ X - Y - Z \_\_\_\_\_

**Yoke** - A structure by which the diaphragm case or cylinder assembly is supported rigidly on the bonnet assembly.