

Glossary of Pneumatic Products and Fittings Terms

Acetal plastic Tough, stable engineering thermoplastic with a high modulus of elasticity, high strength, good rigidity, dimensional stability, resistance to moisture, solvents and other chemicals.

Active device A device that has an input(s) which controls a power supply to the device.

Actuator An integral part of a device that transmits force causing the device to act in the intended manner.

Air motor A device which converts pneumatic fluid power into mechanical torque and motion. It usually provides rotary mechanical motion.

Air, compressed (pressure) Air at any pressure greater than atmosphere.

Air, dried Air with moisture content lower than the maximum allowed for a given application.

Air, free Air at ambient temperature, pressure, relative humidity and density.

Air, saturated Air at 100% relative humidity with a dew point equal to temperature.

Air, standard Air at a temperature of 68.8° F, a pressure of 14.7 pounds per square inch absolute, and a relative humidity of 36% (0.0750 pounds per cubic foot). In gas industries the temperature of "standard air" is usually given as 60.8° F.

Air (see fluid) A gas mixture consisting of nitrogen, oxygen, argon, carbon dioxide, hydrogen and small quantities of neon, helium and other gases.

AND Device A control device which has its output in the logical 1 state if and only if all the control signals assume the logical 1 state.

Boyle's Law The absolute pressure of a fixed mass of gas varies inversely as the volume, provided the temperature remains constant.

Break-out Force necessary to inaugurate sliding. Expressed in same terms as friction. An excessive break-out valve indicates the development of adhesion.

Charles' Law The volume of a fixed mass of gas varies directly with absolute temperature, provided the pressure remains constant.

Circuit, metered-in A speed control circuit in which the control is achieved by regulating the supply flow to the actuator.

Circuit, metered-out A speed control circuit in which the control is achieved by regulating the exhaust flow from the actuator.

Circuit, sequence A circuit which established the order in which two or more phases of a circuit occur.

Compression set The amount by which a rubber specimen fails to return to original shape after release of the compressive load.

Compressor A device which converts mechanical force and motion into pneumatic fluid power.

Condensation The process of changing a vapor into a liquid condensate by the extraction of heat.

Conductor A component whose primary function is to contain and direct fluid.

Containment Any material of substance which is unwanted or adversely affects the fluid power system or components, or both.

Creep The progressive relaxation of a given rubber material while it is under stress. This relaxation eventually results in permanent deformation or "set".

Cushion A device which provides controlled resistance to motion.

Cv Flow coefficient or pneumatic conductance expresses the flow capability of any fixed orifice pneumatic device for a given fluid.

Cylinder cap A cylinder end closure which completely covers the bore area.

Cylinder capacity, extending Volume required for one full extension of a cylinder.

Cylinder, double acting A cylinder in which fluid force can be applied to the moveable element in either direction.

Cylinder, single acting A cylinder in which the fluid force can be applied to the movable element in only one direction.

Cylinder A device which converts fluid power into linear mechanical force and motion. It usually consists of a movable element such as a piston and a piston rod, plunger or ram, operating within a cylindrical bore.

Detented (maintained) The design intention of a device to maintain the state of its last actuation after the operator force is removed.

Diverter (Valve) A device whose power source at one input port is diverted to one of two or more output ports.

Durometer 1. An instrument for measuring the hardness of rubber. Measures the resistance to the penetration of an indenter point into the surface of rubber. 2. Numerical scale of rubber hardness.

Filter 1. A device whose primary function is the removal by porous media of insoluble contaminants from a liquid or a gas. 2. Chemically inert, finely divided material added to the elastomer to aid in process and improve physical properties.

Fitting Pneumatic fittings are connectors or closures for fluid power lines and passages.

Flip flop A digital component or circuit with two stable states and sufficient hysteresis so that it has "memory". Its state is changed with a control pulse; a continuous control signal is not necessary for it to remain in a given state.

Flow rate The volume, mass or weight of a fluid passing through any conductor per unit of time.

Fluid A substance which tends to conform to the outline of its container and is capable of flowing as a liquid or a gas.

Fluid logic A branch of fluid power associated with digital signal sensing and information processing, using components with or without moving parts.

Fluid power Energy transmitted and controlled through use of pressurized fluid.

Fluid, pneumatic A fluid suitable for use in a pneumatic system, usually air.

Gauge damper (snubber) A device employing a fixed or variable restrictor inserted in the pipeline to a pressure gauge to prevent damage to the gauge mechanism caused by rapid fluctuations of fluid pressure.

Gauge, pressure A gauge which indicates the pressure in the system to which it is connected.

Inhibitor Any substance which, when present in very small proportions, slows, prevents or modifies chemical reactions such as corrosion or oxidation.

Lubricator A device which adds controlled or metered amounts of lubricants into a fluid power system.

Manifold Pneumatic manifolds are conductors which provide multiple connection ports.

Maximum inlet pressure The maximum rated gauge pressure applied to the inlet port of the regulator.

Memory Tendency of a material to return to original shape after deformation.

Momentary The design intention of a device to return to the normal unactuated state after the operator force is removed.

Muffler A device for reducing gas flow noise. Noise is decreased by back pressure control of gas expansion.

Non-threaded A term applied to exhaust ports without internal threads to prevent connection.

NOR device A control device which has its output in the logical 1 state if and only if all the control signals assume the logical 0 state.

Normally closed (electrical) The state of the output or switch is ON (passing current) with no external influence.

Normally open (electrical) The state of the output or switch is OFF (not passing current) with no external influence.

Normally closed (fluid power) *often referred to as normally not passing* The state of the output or valve is OFF with no external influence.

Normally open (fluid power) *often referred to as normally passing* The state of the output or valve is ON with no external influence.

NOT device A control device which has its output in the logical 1 state if and only if the control signal assume the logical 0 state. The NOT device is a single input NOR device.

OR device A control device which has its output in the logical 0 state if and only if all the control signals assume the logical 0 state, also known as a shuttle valve.

Operator A device that attaches to another assembly and applies force to the actuator of that assembly allowing it to act in the intended manner.

Packing A sealing device consisting of bulk deformable material of one or more mating deformable elements, reshaped by manually adjustable compression to obtain and maintain effectiveness. It usually uses axial compression to obtain radial sealing.

Pascal's Law A pressure applied to a confined fluid at rest is transmitted with equal intensity throughout the fluid.

Passive Device A device that does not have a dedicated supply source and operates solely on the input(s) alone.

Permanent set The deformation remaining after a specimen has been stressed in tension for a definite period and released for a defined period.

Pneumatics Engineering science pertaining to gaseous pressure and flow.

Poppet A component of a valve that seals or opens an internal passage across its full area to allow or prevent flow.

Port A terminus of a passage in a component to which conductors can be connected.

Pressure Force per unit area, usually expressed in pounds per square inch (bar).

Pressure, absolute The pressure above zero, i.e., the sum of atmospheric and gauge pressure. In vacuum related work it is usually expressed in millimeters of mercury (mm-Hg).

Pressure, atmospheric Pressure exerted by the atmosphere at any specific location. (Sea level pressure is approximately 14.7 pounds per square inch absolute. 1 bar = 14.7 psi).

Pressure, back The pressure encountered on the return side of a system.

Pressure, breakloose (breakout) The minimum pressure which initiates movement.

Pressure, burst The pressure which causes failure of and consequential loss of fluid through the product envelope.

Pressure, cracking The pressure at which a pressure-operated valve begins to pass fluid.

Pressure, differential (pressure drop) The difference in pressure between any two points of a system or a component.

Pressure, proof The non-destructive test pressure, in excess of the maximum rated operating pressure, which causes non-permanent deformation, excessive external leakage, or other resulting malfunction.

Pressure, rated The qualified operating pressure which is recommended for a component or system by the manufacturer.

Quick disconnect coupling A component which can quickly join or separate a fluid line without the use of tools or special devices.

Ring,O A ring which has a round cross-section.

Seal, cup A sealing device with a radial base integral with an axial cylindrical projection at its outer diameter.

Seal, dynamic A sealing device used between parts that have relative motion.

Seal, elastomer A material having rubber-like properties; i.e., having the capacity for large deformation and rapid, substantially complete, recovery on release from the deforming force.

Selector (Valve) A device which selects from separate power sources at two input ports and directs the selected source to a single output port.

Silencer A device for reducing gas flow noise. Noise is decreased by tuned resonant control of gas expansion.

Squeeze Cross section diametral compression of O-ring between surface of the groove bottom and surface of the other mating metal part in the gland assembly.

Stroke Ratio Each push-button valve selected has a given actuation stroke and force. The thumb and Cam Operators will provide an increased stroke and decreased force in the ratios noted while providing a correct ergonomic or machine interface for various system applications.

Vacuum Pressure less than ambient atmospheric pressure measured in inches of mercury (Hg").

Valve A device which controls fluid flow direction, pressure or flow rate.

Valve, air A valve for controlling air.

Valve, directional control A valve whose primary function is to direct or prevent flow through selected passages.

Valve, directional control, 3-way (Note to developer: please link to Category 19) A directional control valve whose primary function is to pressurize and exhaust a port.

Valve, directional control, 4-way Directional valves whose primary function is to pressurize and exhaust two ports.

Valve, flow control (flow metering) A valve whose primary function is to control flow rate.

Valve, needle A flow control valve in which the adjustable control element is a tapered needle. Its usual purpose is the bidirectional control of flow.

Valve, pilot operated (indirect) A valve in which a relatively small flow through an integral flow path (pilot) controls the movement of the main elements.

Valve, Pilot A valve applied to operate another valve.

o

