

Glossary

Actual Pressure Drop — The difference between the inlet pressure and outlet pressure of the valve.

Actuator — Device which develops sufficient thrust to open or close the valve. Common designs include piston, diaphragm, hydraulic, manual handwheel and electro-hydraulic actuators.

Actuator Stem — Part used to connect the valve plug with the piston actuator.

Adjusting Screw — Part used to compress the actuator spring.

Air Filter — Device used to trap water, oil and dirt in air supply or signal lines and prevent it from being passed downstream.

Allowable Pressure Drop — The pressure drop used in valve sizing calculations. If choked flow exists, then allowable pressure drop may be less than the actual pressure drop, depending on the style of valve being sized.

Angle Valve — Body configuration with one port perpendicular to the other port.

Attenuator — MegaStream trim component which reduces gaseous noise. Its construction involves a series of multi-hole stages.

Automatic Control Valve — Final control element used in process systems to regulate flow, pressure or temperature of a liquid or gas.

Body — The pressure retaining housing through which the service fluid flows. It has inlet and outlet connections, and houses the trim components.

Bonnet — The valve component which houses the guides and packing. It also seals one opening to the body.

Bonnet Flange — Flange that attaches the bonnet to the body.

Buttweld End Connection — End connection with angles cut into the body hub to provide for a weld between the body and pipe.

Cartridge — ChannelStream trim component which prevents cavitation and minimizes hydrodynamic noise. Construction is a series of cylinders with interconnected channels and drilled holes (plenums).

Cavitation — Phenomenon that occurs in liquid flow when the pressure at the vena contracta falls below the vapor pressure and then recovers above the vapor pressure. The pressure recovery causes vapor bubbles which have formed in the liquid to implode (collapse).

Choked Flow — A flow rate which cannot be increased by decreasing the downstream pressure. In liquids, flashing and cavitation limit the flow through a valve due to vapor bubbles mixed with liquid which crowd the vena contracta. Eventually a condition is reached where flow is saturated and can no longer be increased. With gases, as the velocity reaches sonic, a reduction in the downstream pressure will no longer be increased.

Cold Box Bonnet — A hollow extended bonnet which allows stagnated, moderate temperature gas to form, protecting the packing from cryogenic temperatures.

Controller — Electronic or pneumatic device used to control the actual pressure, temperature or level of the process. It compares a set point of the measured variable against the actual condition and then sends an instrument signal to the control valve to correct imbalanced conditions.

C_v — The number of US gallons per minute of water at 60 degrees Fahrenheit that will flow through a valve with a 1 psi pressure drop. 1 C_v = 1 US gal/min @ 60°F with a 1 psi drop.

Cylinder — Actuator part used for containing air pressure and enclosing the piston.

Dead Band — Maximum change in input required to cause a reversal in valve stem movement.

Diaphragm — Single-acting actuators characterized by low actuator operating pressure and fair performance. Its design includes individual spring and air chambers separated by a diaphragm.

Diffuser — An anti-noise device installed downstream from a control valve, which has multiple holes to divide the flow into smaller streams or jets, alter patterns of turbulence, and reduce the amount of energy being converted to noise.

Disc (Disk) — Component which swings through the opening of a wafer or butterfly-style valve and acts as the closure member.

Double-acting — Term used to describe supplying and exhausting air to both sides of the piston simultaneously.

Double Top-guided — A packing box configuration which uses two widely spaced guides, one at each end of the packing box, to guide the plug.

Dual Springs — Two actuator springs (one inside the another) which provide additional thrust beyond the capability of the standard spring.

Equal Percentage Flow Characteristic — An inherent flow characteristic which, for equal increments of rated travel, will ideally give equal percentage changes of the existing flow.

Expanded Outlet — Body configuration with standard trim gallery and oversized ports. (Mark One-X)

Extended Bonnet — A longer than normal bonnet which protects the packing and actuator from extreme heat or cold.

Fail-safe — A system designed to open, close, or hold in last position should the air supply fail.

Field Reversible — Actuators and positioners that can be changed from air-to-open to air-to-close (and vice versa) without additional parts.

Flashing — Phenomenon that occurs when liquid pressure falls below the vapor pressure in a control valve and does not recover above the vapor pressure at valve outlet. This causes large volumes of vapor to remain in the flow, resulting in a higher flow velocity.

Frequency Response — A standardized measure of how fast a system is or how well it can keep up with a changing input signal. In technical terms, it is the response of a system or device to a constant amplitude sinusoidal input signal. The output amplitude and phase shift are observed at various frequencies and are plotted as a function of input signal frequency. Frequency response data is generally presented as a plot of amplitude ratio and phase shift versus frequency. It is also commonly presented as the frequency where the system output is reduced by 6 dB (50 percent of amplitude of very low frequencies) and the corresponding phase shift at that frequency.

Gasket — Material used to prevent leakage of the service fluid from a joint under fluid pressure, such as between the bonnet and body, between a sleeve and bonnet, or between the body and the seat ring.

Gland Flange — Part used to retain and control the compression force on the packing in the bonnet.

Globe Valve — Cast body featuring streamlined, constant area passages, usually with in-line ports.

Guides — Bushings contained in the packing box which align the plug with the seat ring.

Handlever — Device attached to rotary-motion valve with preset positions to manually position (open or close) the valve.

Handwheel — Device attached to actuator used to manually position (open or close) the valve.

Hardened Trim — Special material applied to valve trim for added strength to minimize effects of erosion, cavitation and corrosion.

Hysteresis — Maximum amount of position error for the same input signal when approached from opposite directions.

Inherent Flow Characteristic — Flow characteristic when a constant pressure drop is maintained across the valve.

Installed Flow Characteristic — Flow characteristic of the total system which includes effects of valves, pumps, piping configurations, etc. in the system.

Instrument Signal — An electric or pneumatic signal used to communicate the desired valve position between a controller and the positioner.

Integral Flange — End connection which is cast or fabricated as an integral part of the valve body.

Integral Seat — A seating surface machined directly into the body and used with an oversized plug for additional flow capacity or other special application.

Leakage — The amount of fluid that will pass through a control valve when it is fully closed at a given pressure and temperature.

Lever Operator — Pivoted levers attached to actuators for mechanical adjustment and automatic positioning of other devices, such as dampers or louvers.

Limit Stop — Device attached to actuator used to limit or restrict the motion of the actuator.

Limit Switch — Switch used to indicate a valve's open, closed or intermediate position.

Linear Flow Characteristic — An inherent flow characteristic for which equal increments of rated travel yield equal increments of flow at a constant pressure drop.

Lock-up System — System used to hold actuator in last operating position upon air failure.

Lubricator — A device which supplies lubricant to the packing box.

Metal Bellows Seal — A specially constructed metal bellows installed in an extended bonnet or in the body for applications requiring zero leakage to atmosphere.

Noise Attenuation Plate — Multi-staged, anti-noise device installed downstream from a control valve in gaseous applications.

Offset Globe Body — Body configuration with inlet and outlet ports parallel but offset (not in-line).

Oversized Actuator — Larger actuator used instead of standard actuator in order to meet thrust requirements.

Packing — Material used to seal the valve from leaking around the plug stem.

Packing Box — Internal bore of bonnet which contains guiding and packing.

Piston — Part used to separate two air chambers of piston actuator.

Piston Actuator — Double-acting actuator designed with piston inside a cylinder. Throttling actuator uses a positioner to position the piston inside the cylinder. It is designed to handle air supply pressures up to 150 psi. Springs are provided on one side of the piston for fail-safe operation.

Plug — Part that moves in and out of the seat ring to open and close the valve. It can also be used to characterize the flow.

Positioner — Device that receives an electronic or pneumatic signal, compares it to the stem position and converts that signal to air pressures which are sent to the actuator.

Position Transmitter — Device used to transmit the position of the actuator stroke via pneumatic or electronic signals.

Pressure-balanced Trim — A trim design which enables the inlet pressure to act on both sides of the plug, greatly reducing the off balance forces — normally used for high pressure drops.

Pressure Drop — The difference between the inlet and outlet pressures in a control valve.

Proximity Switch — A limit switch used to indicate valve position by using a sensor and without the use of mechanical contact.

Quick Exhaust Valve — Device used to quickly vent one side of the actuator to achieve an immediate full-open or full-closed position.

Quick Open Flow Characteristic — An inherent flow characteristic in which there is maximum flow with minimum lift.

Rangeability — The ratio between maximum and minimum controllable flows, taking into account the ability of the actuator to accurately position the closure device.

Repeatability — Maximum change in input signal required to cause a change in valve stem position when approached from the same direction.

Resolution — Smallest possible change in the valve stem position when given an input signal.

Response Level — Maximum change in input signal required to cause a change in the valve stem position in one direction.

Screwed End Connection — Body connection using a female NPT (National Pipe Thread) thread to mate with a male NPT pipe thread.

Seat Ring — Trim component the plug makes contact with to close the valve.

Seat Retainer — Trim component which clamps the seat ring in place. The seat retainer does not guide the plug, and should not be confused with a cage.

Separable Flange — Unwetted flange which is not integral to the valve body. It is held in place by half-rings and a groove in the body hub. Since it is unwetted, it is usually manufactured from less costly carbon steel.

Sigma — Cavitation index which is a ratio of the potential for resisting cavitation to the potential for causing cavitation.

Shaft — Component in rotary valves that connects the closure member to the actuator.

Single-acting — Term used to describe an air chamber acting against a spring force, such as a diaphragm actuator.

Sleeve — Special pressure-balanced trim seat retainer which provides a sliding seal surface for a pressure-balanced plug seal to prevent leakage in pressure-balanced trim.

Socketweld End Connection — End connection with recessed bore in the body which mates with the corresponding pipe. A weld is then applied between the body face and the pipe.

Soft Seat Ring — Seat ring which uses an elastomeric seat insert for bubble-tight shutoff.

Solenoid — Control mechanism used to control actuator supply pressure in on/off applications or signal pressure in throttling applications.

Speed Control Valve — Device used to control or limit the valve stroking speed by restricting the air flow to or from the actuator.

Spring — In piston actuators, the part which provides force for fail-safe operation; in diaphragm actuators, the part that provides force to counteract air pressure from the opposing chamber.

Spring Button — The part that prevents movement of the actuator spring and permits the adjusting screw to compress the spring.

Steam Jacket — Jacket applied to outside of valve body to allow for external heating or cooling of process fluid.

Stem Clamp — Component which serves to clamp the plug stem to actuator stem, prevent plug rotation, indicate position of the plug and provide feedback to the positioner. Also serves as a mounting pad for limit switch trips.

Switching Valve — Device used to activate fail-safe systems by sensing a decrease in the air supply pressure.

Three-way Valve — Body configuration with three ports to use in either combining or diverting services.

Transducer — Device used to change an electrical signal to a pneumatic signal.

Transfer Case — Component in butterfly and ball valves that converts linear actuator motion to rotary shaft motion.

Trim — Combination of the plug, seat ring and seat retainer (or sleeve).

Turn Down Ratio — Portion of the rangeability which is available. For example, a valve with a rangeability of 100:1 and selected with maximum controlled flow equal to 75 percent of valve capacity will therefore have a turn down ratio of 75:1.

Vena Contracta — The point immediately downstream from an orifice or valve seat which is the point of lowest pressure and highest velocity.

Vent Element — Anti-noise device for gaseous applications that is mounted to outlet of control valve for vent applications.

Volume Booster — Device used to increase the actuator stroking speed.

Volume Tank — Air tank used to supply additional air to stroke the valve upon air failure.

Yoke — A component which secures the actuator to the valve body.