

ACRO Pinch Valves Glossary of Technical Terms

Analog Position Sensor: A type of position sensor whose voltage output varies over a range of values.

Body: The component of a pinch valve that secures the tubing.

Closed State: The state a pinch valve is in when the tubing is pinched.

Continuous Duty: Energizing a solenoid valve at a constant level of power for its entire on-time.

Dashpot or Noise Reduction Module: A mechanical device used to decrease plunger velocity for controlling noise.

Digital Position Sensor: A type of position sensor whose voltage output has only two states.

Drop-Out Voltage: Refers to the power level at which the internal forces in the solenoid valve (spring and friction) overcome the magnetic field and can no longer maintain a latched condition. Drop-out voltage is one of the measurements used to determine solenoid limits.

Durometer: A standard for quantifying the hardness of rubber, plastic, and other non-metallic materials. Typical hardness of flexible tubing ranges from 50 to 70 Durometer on the "A" scale.

Duty Cycle: The relationship between the energized and non-energized time of an electric pinch valve usually expressed as a percentage (%). Duty cycle is determined by $(\text{ON time}) / (\text{ON time} + \text{OFF time})$. For example if a pinch valve is energized for 1 second out of 4 seconds, the duty cycle is $1/(1+3) = 1/4 = 25\%$. **State Feedback:** The output from a position sensor indicating the position, or state, of the valve.

Hall Effect Sensor (Hall Sensor): A type of position sensor that senses magnetic field strength and produces a voltage that changes with this strength. Hall sensors can have digital or analog outputs.

Heat Rise: The rise in temperature above ambient that results from operating an electric pinch valve at predetermined conditions.

Hold-In Voltage: Refers to the power required to maintain a latched condition within a solenoid, keeping the plunger (or moving core) magnetically latched to the fixed pole. Power required for hold-in is approximately 10% of the pull-in power (4-7W). Operating solenoids at a low power hold level saves energy and heat.

Manual Override: A button that allows the valve's state to be changed manually. **Media:** The substance that flows through the tubing, either a gas, liquid, powder or slurry.

Media Pressure: The pressure of the media inside the tubing. **Micro Switch:** A type of digital position sensor that is mechanically linked to a valve.

Normally-Closed (N/C) valve: A pinch valve that in which the tubing is pinched in the de-energized state.

Normally-Open (N/O) valve: A pinch valve in which the tubing is not pinched in the de-energized state.

Open State: The state a pinch valve is in when the tubing is not pinched. **Pinch Force:** The force exerted by the pinch valve on the tubing in the CLOSED state, usually enough to set a level high enough to occlude flow. **Pinch**

Gap: The distance between opposed pinching surfaces when a pinch valve is closed.

Pinch valve: A device used to pinch and unpinch flexible tubing for the purpose of controlling flow.

Pinching Surfaces: The surfaces of components in a pinch valve that pinch the tubing, usually the pinch ridge and plunger.

Plunger: The component of a pinch valve that translates during a change of state and pinches the tubing.

Pneumatic Pinch Valves: A type of pinch valve that uses pneumatic pressure to actuate the plunger.

Position Sensing: Using electronic sensors to monitor the valve's position and provide electronic feedback indicating the valve's position to a human user or computer.

Pneumatic 3-Way Control Valve: Typically a 3-way solenoid valve used to send actuating air pressure to a pneumatic pinch valve.

Pull-In Voltage: Refers to the power required to overcome internal forces in the solenoid valve (spring and friction) and to reach a latched condition. Latching is achieved when the plunger (or moving core) has moved through its stroke as a result of the solenoid field and becomes magnetically latched to the pole (or fixed core). The time it takes to move the plunger is called the pulse duration, which is a high power (40-70 W) spike for a short period of time (200-500 ms).

Pulse and Hold: A technique for increasing performance of solenoid valves by minimizing power consumption and heat generation. The valve is opened with a pulse of DC power and held open at reduced power

Snap-In Tube Loading: A feature of Acro pinch valves that allows tubing to be installed in the valve without requiring a free end; the middle of the tubing "snaps in" the body.

Solenoid Controller (Pulse and Hold): A programmable device designed to be part of the control circuit in a fluid control system. This device is capable of enhancing solenoid performance; including long on times, high cycle rates, power and heat reduction.

Solenoid Pinch Valves: A type of pinch valve that employs electrical energy and a solenoid to actuate the plunger.

Splash Seals: Internal plunger seal and external mounting seal guard against spills and debris, prevent contaminants from entering valve, and allow for cleaning without disassembly.

Total Opening: The distance between opposed pinching surfaces when a pinch valve is open. The total of pinch gap and stroke.

Tube Detection: A sensor technique for determining the presence of loaded tubing within a pinch valve.

Tube Slot: A slot in the side of the body for tubing to be loaded into.