



## GENERAL APPLICATION TERMS

**On-Off Service:** Valve operated to full open/close position to start or stop flow.

**Modulating Service:** Valve positioned to throttle or regulate flow.

**Media:** Material flowing through the valve.

**Maximum Shut-Off Pressure:** Pressure of the media flowing into the valve against which the valve will have to actuate.

**Service Temperature:** Maximum and minimum temperature of the media.

**Supply Pressure:** Air supply pressure available to operate a pneumatic actuator.

**Stem Torque:** Force required at the valve stem to open or close the valve against media pressure. Stem torque mainly depends upon the tightness of the stem nut. If the nut is too loose, the valve shows stem leakage; if the nut is too tight, the valve torque requirement increases.

## ACTUATOR TERMS

**Compact Actuator:** Actuator with a torque range below 10,000 Lb-In (1,130 Nm).

**Quarter-Turn Actuator:** Actuator rotating at a 90° angle to full open position and returns to a 0° angle to full close position.

**Multi-Turn Actuator:** Actuator rotating more than 360°.

**Linear Actuator:** Actuator drive that move axially instead of rotary.

**Electric Actuator:** An electro-mechanical device used to open, close or modulate a valve. The actuator operates the valve using an electric motor driving a gear train. The actuator, which is mounted to the valve by a bracket and coupled to the stem, is designed to convert electric power into mechanical force sufficient to operate the valve.

**Electric Spring Return Actuator:** Electrically driven actuator that contains an internal spring to actuate the valve on loss of electricity.

**Electric Fail-Safe Actuator:** Electrically driven actuator that contains an internal or external battery back-up systems that upon unexpected loss of main supply power allows to operate valve in normal conditions for several hours.

**Pneumatic Actuator:** An air-operated mechanical device used to open and close or modulate a valve. While the basic function of the pneumatic actuator is similar to the electric, there are distinct differences in the application and flexibility of the two types, and these differences should be considered to select the proper type.

**Pneumatic Double-Acting Actuator:** Any pneumatic actuator which uses air to drive the actuator output shaft in both the open and close direction. The air supply is piped to one side of a piston drive or a diaphragm while the air contained on the opposing side is exhausted.

**Pneumatic Spring-Return Actuator:** Any pneumatic actuator which contains at least one coil spring to oppose the movement of a piston or diaphragm. As air moves the piston or diaphragm the spring is compressed. When the air supply is discontinued and exhausted, the spring extends and drives the piston or diaphragm in the opposite direction. This type of actuator is normally used for applications where it is necessary for the valve to move to the open or close position upon loss of air supply, whether by design or by system failure.

**Fail-Open:** Electric/pneumatic spring return actuator where the spring will drive the valve to the open position upon loss of power/air (may be termed "power/air-to-close").

**Fail-Closed:** Electric/pneumatic spring return actuator where the spring will drive the valve to the close position upon loss of power/air (may be termed "power/air-to-open").

## ACTUATOR ACCESSORY AND RATING TERMINOLOGY

**NEMA Rating:** National Electrical Code Ratings for electrical component enclosures.

**NEMA 4:** Weather-proof enclosure suitable for indoor/outdoor applications to protect from windblown dust, rain or hose-directed water.

**NEMA 4x:** Offers the same protection as NEMA 4 with the addition of corrosion resistance.

**NEMA 6:** Enclosure that may be submerged up to six feet for 30 minutes.

**NEMA 7:** Enclosure for hazardous locations, must be capable of withstanding an internal explosion of gases so as not to ignite an external gas-air mixture.

**Solenoid Valve:** Also called pilot valve. An electro-magnetically operated valve which enables electrical control of the air supply to a pneumatic actuator. Double-acting actuators require a 4-way, 5 ported, single coil solenoid, while spring-return actuators require a 3-way, 3 ported, single coil solenoid to achieve the proper supply-exhaust air flow patterns.

**Positioners:** Instrument used with piston actuators and some diaphragm actuators to convert a control signal to a valve position in modulating service. There are two basic styles of positioners: pneumatic, designed to receive a 3 to 15 PSI signal and electro-pneumatic, designed to receive a 4 to 20 mA.

**Manual Override:** Any electric actuator by which a valve may be manually operated in the event of a power failure. On smaller actuators, this may simply be wrench flats on the output shaft of the actuator. Larger actuators are equipped with declutching manual overrides. Declutching manual overrides disengage from the gear train enabling the user to turn the valve with greater ease. All Indelac electric actuators are equipped with manual overrides.

**Limit Switches:** Electrical switches signaling that the valve cycle has been completed. Each switch is activated by an adjustable tripping device driven by the actuator. Normally one switch is adjusted to trip in the open position and one is adjusted to trip in the closed position. Optional additional switches are available to perform other functions. All electric actuators have Open/Close limit switches.

**Mechanical Limit Switch:** Any limit switch (usually plunger or lever type) that is mechanically activated by the tripping mechanism making physical contact with the switch, and is normally used for remote valve position indication.

**Proximity Limit Switch:** A solid state switch that is electrically tripped without mechanical contact being made. This type of switch is generally used to interface with computer or microprocessor controls.