

LOCKOUT VALVES and DELAYED-PRESSURE-BUILDUP VALVES

OSHA Requirements Clearly State, “Energy Isolating Devices, Such As Lockouts, Are Now Required.”

Federal regulation 29 CFR 1910.147 of the Occupational Safety and Health Administration (OSHA) details safety requirements for the control of hazardous energy during “... the servicing and maintenance of machines and equipment in which the unexpected ... startup ... could cause injury ...” Here are a few other highlights from the regulation:

ENERGY SOURCE. “Any source of electrical, mechanical, hydraulic, pneumatic, thermal, or other energy.”

LOCKOUT DEVICE. “A device that utilizes a positive means such as a lock, whether a key or combination, to hold an energy isolating device in the safe position ...”

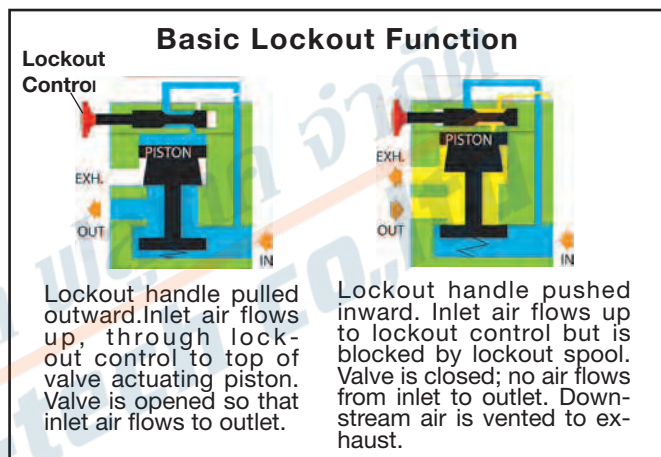
PURPOSE. “This section requires employers to establish a program and utilize procedures for affixing appropriate lockout devices . . . to prevent unexpected energization, startup or release of stored energy ...”

TIMING. “After October 31, 1989, whenever major replacement, repair, renovation or modification of machines or equipment are installed, energy isolating devices for such machines or equipment shall be designed to accept a lockout device.”

In short, each piece of equipment must have a shutoff valve to isolate the equipment from its air supply. The shutoff valve must be lockable in the closed position so that it cannot inadvertently be opened. When closed the shutoff valve must have an exhaust port to exhaust downstream pressurized air.

LOCKOUT VALVES

Lockout valves are offered in a full range of port sizes, and with different actuation modes. Each valve is designed to satisfy the OSHA requirements for energy isolation



GUIDE to LOCKOUT VALVES and DELAYED-PRESSURE-BUILDUP VALVES

Valve Series	Port Sizes										Pages	
	1/8	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2		
SENTRY												
V10 Lockout Models †	X	X										12-13
GUARDSMAN												
V35 Lockout Models		X	X	X	X							14-15
VANGUARD Lockout												
V40 Manual Models			X	X	X	X	X					16-19
V450 Manual Pilot Models						X	X	X	X	X	X	20-21
V460 Solenoid Pilot Models		X	X	X	X	X	X	X	X	X	X	22-23
DELAYED PRESSURE BUILDUP												
V470 Air Pilot Models		X	X	X	X	X						24-25
V475 Solenoid Pilot Models		X	X	X	X	X						26-27
V495 Models		X	X	X	X	X	X	X				28-29
LOCKOUT plus DELAYED PRESSURE BUILDUP												
V45M Manual Models			X	X	X							30-31
V380 Slide Lockout Models		X	X	X	X							32-33
V382 and V383 manual control high-flow exhaust lockout valve.			X	X	X							
V480 Air Pilot Models		X	X	X	X	X						36-37
V485 Solenoid Pilot Models		X	X	X	X	X						38-39
AUXILIARY VALVES (Flow Control, Shuttle, Check)												40-49

† Also available with quick-connect tube fittings up to 10 mm.



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and lockout. They are not, however, intended as emergency stop devices.

They lock out the supply air in a system with an easy pushing or sliding motion, and also exhaust downstream air pressure. Even after extended periods on standby, the valves are designed with seals and materials that allow the lockout

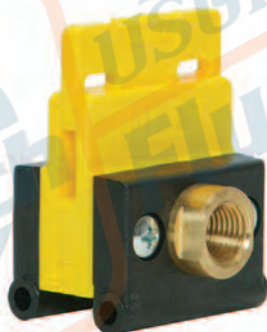
control to move smoothly into the lockout position.

All Master Pneumatic lockout valves can be secured in the closed position by means of a padlock so that the valve cannot be inadvertently opened to cause a potentially hazardous situation. Shown above is one of the manual lockout valves padlocked in the closed position.

SENTRY V10 SLIDE LOCKOUT VALVE.

This lockout valve was developed for use with the **SENTRY** series of modular **FRLs**. A slide controls the lockout function. Sentry modules and assemblies are available with this valve installed, or the valve can be retrofitted in the field.

As a separate component the **SENTRY** lockout valve is available with a choice of two pipe sizes and six sizes of quick-connect tube fittings.



This valve has a sliding sleeve to control the lockout function. A built-in slide latch holds the lockout control in the closed

position, and for further security the valve can be padlocked in this position. The valve has the built-in colors safety yellow and caution red to make the valve conspicuous in the workplace. The operating sleeve resists accidental shutoff, yet because it is Teflon-coated it slides without sticking even after a long period on standby.

The V35 valve is available in port sizes from 1/4 to 3/4 and with flow coefficients (C_v) from 2.4 to 7.3.

VANGUARD V40 MANUAL LOCKOUT VALVE

The valve has a large red operating handle for high visibility. A short inward push of the handle closes off the flow of air, and quickly exhausts downstream air. The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Of course, the valve can be padlocked in the closed position.

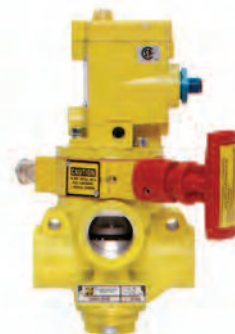


The V40 valve is built in two body sizes with port sizes from 3/8 to 1-1/4. Flow coefficients (C_v) range from 6 to 20 so that these valves are useful in a wide range of applications.

VANGUARD V450 and V460 PILOTED VALVES with LOCKOUT CONTROL.

Series V450 valves are air piloted valves, while the Series V460 valves employ a solenoid pilot. Both valves can be operated remotely. In other respects the valves are similar.

GUARDSMAN V35 SLEEVE LOCKOUT VALVE.



(continued on next page)



They are 3-way poppet valves with a lockout control interposed between the pilot signal and the valve's actuating poppet. The lockout control has a conspicuous red handle which, when pushed inward, cuts off the pilot signal and renders the valve inoperative. The handle can then be padlocked for complete safety.

The V450 valves are built in two body sizes with port sizes ranging from 1 to 2-1/2, and flow coefficients (C_v) ranging from 23 to 70. The V460 valves are built in four body sizes with port sizes ranging from 1/4 to 2-1/2, and flow coefficients (C_v) ranging from 2.5 to 70, making them suitable for nearly all applications. See individual product page for available voltages.

DELAYED-PRESSURE-BUILDUP VALVES

When actuated, valves with the delayed-pressure-buildup (DPB) feature allow a gradual buildup of downstream air pressure. This allows cylinders and other work elements to move slowly and more safely into their normal working positions. After downstream pressure has reached a certain level the valve opens fully and downstream pressure is at its maximum level.

The DPB function is achieved by requiring the initial flow of air to pass through a restricted orifice so that the buildup of downstream pressure is slowed. The restricted orifice may be fixed or adjustable to control the rate of pressure buildup. The change of air flow from restricted to full flow is accomplished either manually or by a built-in timing device. The functioning of a basic valve with DPB is shown in the sketches at the bottom of the page.

Some of the DPB valves described below also have a lockout control, so that they serve the double functions of delayed-pressure-buildup and lockout control. Those with the added lockout feature can all be padlocked in the closed position.

SERIES V470 and V475 DELAYED-PRESSURE-BUILDUP VALVES.

Series V470 valves are air piloted valves, while the Series V475 valves employ solenoid pilots to permit remote control. In other respects they are similar.

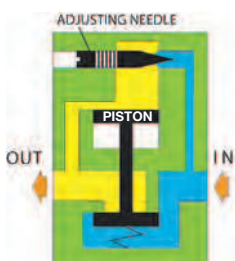
They are 3-way poppet valves with a DPB device interposed between the pilot signal and the valve's actuating poppet. An adjustable control determines the rate of delayed pressure buildup. There is also an exhaust port through which downstream air is exhausted when the valve is de-energized. Threads in the exhaust port allow the installation of a silencer or a line for remote exhaust-



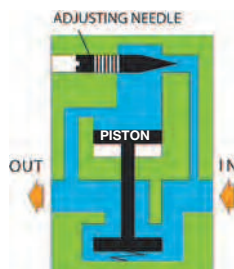
DELAYED-PRESSURE-BUILDUP (DPB) FUNCTION

The illustrations below show the DPB function of a 2-way valve. They show the use of a restricted orifice to delay pressure buildup and to "time" the full opening of the valve. Three-way valves require a slightly more complex arrangement, and also have the advantage of a specific port for exhausting downstream air. See following pages for operating details of other DPB valves.

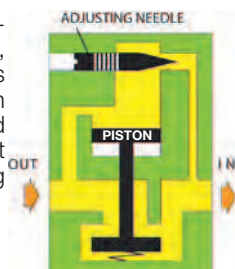
When air pressure is first applied to the inlet, air flow to the actuating piston is restricted by the needle. Downstream pressure gradually builds up at a rate determined by the needle setting.



When downstream pressure reaches a certain percentage of inlet pressure, it is enough to actuate the valve's piston and the inlet poppet opens. The valve is now open to full air flow.



When inlet pressure is removed, downstream air is exhausted through the inlet port and around the point of the adjusting needle.



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ing. These valves should be used in conjunction with lockout valves.

They are built in two body sizes with port sizes ranging from 1/4 to 1, and flow coefficients (C_v) ranging from 2.5 to 8. See individual product page for available voltages.

SERIES V495 DELAYED-PRESSURE-BUILDUP VALVES.

A V495 valve is a 2-way valve with a **DPB** function. An adjustable restrictor within the valve determines the buildup rate of downstream air pressure. When downstream pressure reaches approximately 40% to 60% of inlet pressure, the valve shifts to the fully open position. The V495 valves should be used in conjunction with lockout valves.



The valves are made in three body sizes with ports ranging from 1/4 to 1-1/2, and flow coefficients (C_v) from 2.3 to 29.

SERIES V45M MANUAL LOCKOUT plus DELAYED-PRESSURE-BUILDUP VALVES.

When opened by an outward pull of its blue handle, the valve allows a gradual buildup of downstream air pressure. It opens to full flow when it's outlet pressure is 25 psi less than it's inlet pressure. An adjustable screw in the top of it's handle sets the rate of pressure buildup.

When the handle is pushed inward the valve's lockout function is like that of the V40 lockout valve described above. Inlet air is blocked, and downstream air is exhausted.

The valves have ports ranging from 3/8 to 3/4, and flow coefficients (C_v) from 6 to 8.6.



SERIES V380 SLIDE LOCKOUT plus DELAYED-PRESSURE-BUILDUP VALVES.

The V380 valve is specifically designed to be used with Series 380 **FRL's**. It is modularly connected to the FRL, and can be rotated to any of eight positions for the most convenient operation.

A sliding Delrin plate with a detent is used to go from the closed position, to the delayed-pressure-buildup position, and then to the fully open position. An override button must be depressed to move from the **DPB** position to the fully open position. If a fast start is required, the slide can be moved directly from the closed to the fully open position by holding the override button down, while lifting the slide.



SERIES V480 and V485 LOCKOUT plus DELAYED-PRESSURE-BUILDUP VALVES.

Series V480 valves are air piloted valves, while the Series V485 valves employ solenoid pilots. Both allow remote control. In other respects the valves are similar.

They are 3-way poppet valves with both lockout and **DPB** devices interposed between the pilot signal and the valve's actuating piston. When the handle on the lockout control is pulled outward the **DPB** function allows a gradual buildup of downstream air pressure before the valve opens to full flow. An adjustable control determines the rate of pressure buildup. There is also an exhaust port through which downstream air is exhausted when the valve is de-energized or the lockout control is actuated. Threads in the exhaust port allow the installation of a silencer or a line for remote exhausting.

When the handle of the lockout control is pushed inward the valve's lockout function is like that of the V470 or V475 lockout valves described above. Inlet air is blocked, and downstream air is exhausted.

These valves are built in two body sizes with port sizes ranging from 1/4 to 1, and flow coefficients (C_v) ranging from 2.5 to 8. See individual product page for available voltages.

