SKINNER V-9 Series Four-Way Pilot Operated Valves

SPECIFICATIONS

Mechanical Characteristics

Standard Materials of Construction

- Body–Zinc
- Seals–NBR
- Sleeve–Stainless Steel (304)
- Plunger–Stainless Steel (430FR)
- Shading Ring–Copper (AC & DC only)
- Stop–Stainless Steel (430FR)
- Springs–Stainless Steel (18-8)
- Orifice–Stainless Steel (303)

Compatible Fluids

- Lubricated Air, Non-Lubricated Air, Inert Gases, Hydraulic Fluids, and additional fluids compatible with materials of construction.

Electrical Characteristics

Voltages

- DC–12, 24, 120
- AC–24/60, 120/60, 240/60 (other voltages available upon request)

Power Consumption

- 10 watts per coil (2 coils)

Agency Approvals

- UL and CSA approvals are generally available on valves with applicable coil/enclosure combinations. For details, please consult Skinner Valve.

Miscellaneous

Operating Speed

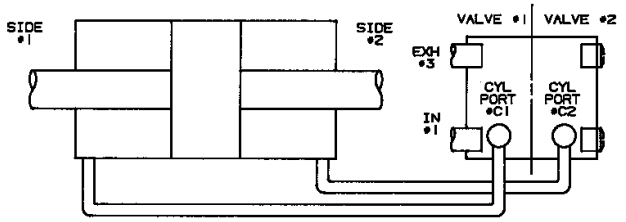
- Up to 600 cycles per minute.

Response Time

- AC–Approximately 4-8 milliseconds to open or close.
- DC–Approximately 10-15 milliseconds to open, 6-12 milliseconds to close.

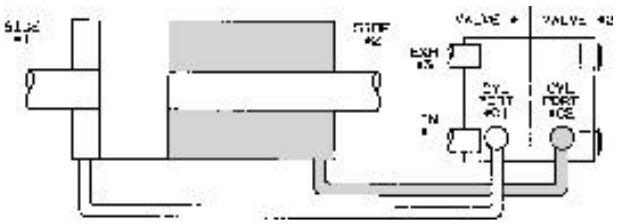
V933 Four-Way Normally Closed–Normally Closed Valves

When de-energized, both inlet ports are closed by the two plungers preventing flow from the common inlet through both of the valves. The cylinder port in each valve is open to the common exhaust, permitting flow from the cylinders to the exhaust. When the coils are energized, both valve plungers rise, opening the inlet orifices, and at the same time closing the orifices in the sleeves. This stops flow from the cylinder ports to the exhaust, and permits flow from the inlet to the cylinder ports.

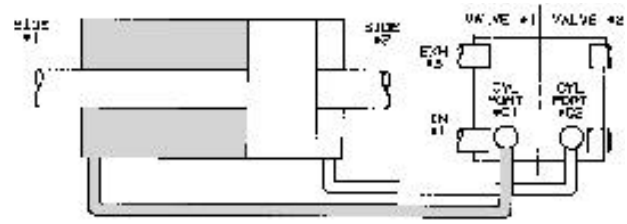


Typical Cylinder Operation with V933 Valves.

Both coils de-energized–The inlet pressure is closed to both sides of a double-acting cylinder. Side #1 and side #2 of the cylinder are open to exhaust through cylinder ports #C1 and #C2. The piston can be shifted manually.



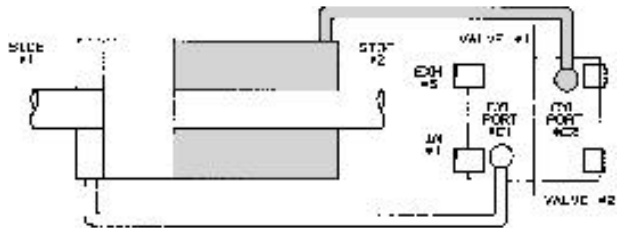
Coil of valve #1 de-energized; coil of valve #2 energized–The inlet pressure is closed off to side #1 of the double-acting cylinder; the exhaust is open through cylinder port #C1. Side #2 of the cylinder is closed to the exhaust and open to inlet pressure through cylinder port #C2. The piston moves to the left.



Coil of valve #1 energized; coil of valve #2 de-energized–The inlet pressure is open to side #1 of the double-acting cylinder through cylinder port #C1, the exhaust is closed off by the plunger insert. Side #2 of the cylinder is open to exhaust through cylinder port #C2, the inlet is closed off by the plunger insert. The piston moves to the right.

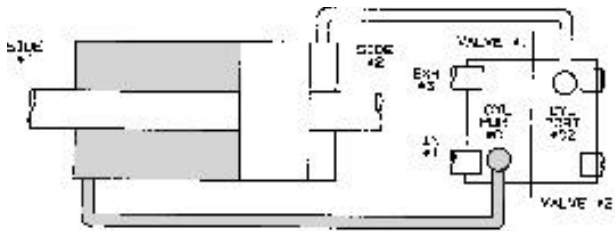
V935 Four-Way Normally Closed-Normally Open Valves

The plungers of the two valves are at opposite positions in both the energized and de-energized conditions - one normally open while the other is normally closed. When de-energized, fluid flows from the inlet of the valve through the inlet port of the normally open valve, through the sleeve, and out the cylinder port of the valve. At the same time, the normally closed valve inlet orifice is closed, but the orifice in the sleeve is opened, permitting flow from its cylinder port to the common exhaust. Therefore, fluid flows from the inlet of the valve to the cylinder port of the normally open valve and from the cylinder port of the normally closed valve to the exhaust. When energized, the two valves reverse in position.



Typical Cylinder Operation with V935 Valves.

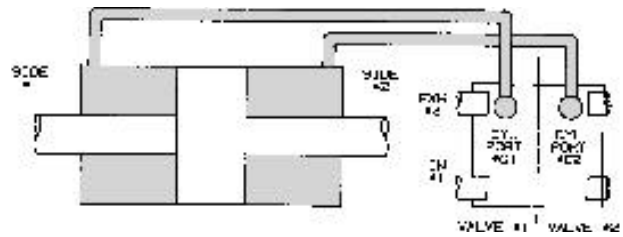
Both coils de-energize – The inlet pressure is open to side #2 of the double-acting cylinder through cylinder port #C2 and the plunger insert closes off the exhaust. Side #1 of the cylinder is open to exhaust through cylinder port #C1 and the inlet pressure is closed off. This causes the piston in the cylinder to move to the left.



Both coils energized – The inlet pressure is open to side #1 of the cylinder through cylinder port #C1 and the exhaust is closed off. Side #2 of the cylinder is open to exhaust through cylinder port #C2 and the inlet pressure is closed off by the plunger insert. The piston moves to the right.

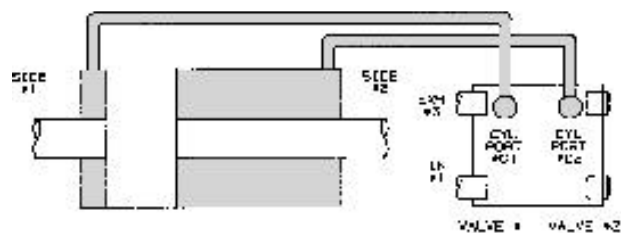
V955 Four-Way Normally Open-Normally Open Valves

Both plungers are in the same position when the coils are de-energized. In this condition, fluid flows through the common inlet of the body, up through the sleeves of both valves, and out the cylinder ports of the valves. Both orifices in the sleeve stops are closed to the exhaust ports by the plunger. In the energized position, both valve plungers operate together to close the inlet ports, stopping flow into the valve. At the same time, the orifices in the sleeves are opened, permitting flow from the cylinder ports to the common exhaust port in the body.

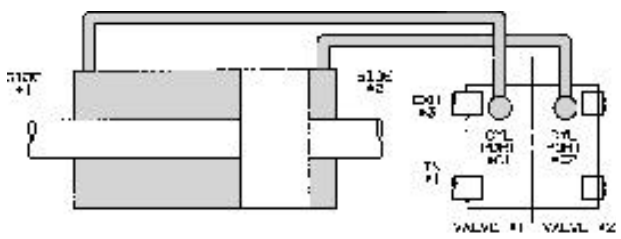


Typical Cylinder Operation with V955 Valves.

Both coils de-energized – The inlet pressure is open to both sides of the double-acting cylinder through cylinder ports #C1 and #C2. Both sides of the cylinder are closed to exhaust by the plunger insert.



Coil of valve #1 energized; coil of valve #2 de-energized – The inlet pressure is closed to side #1 of the double-acting cylinder and open to exhaust through cylinder port #C1. Side #2 of the cylinder is open to the inlet pressure, through cylinder port #C2 - the exhaust is closed off by the plunger insert. The piston moves to the left.



Coil of valve #1 de-energized; coil of valve #2 energized–The inlet pressure is open to side #1 of the cylinder through cylinder port #C1 and the exhaust is closed off by the plunger insert. Side #2 of the cylinder is open to exhaust through the cylinder port #C2 and the plunger insert closes off the inlet pressure. The piston moves to the right.

V933 PILOT OPERATED ZINC VALVES–NORMALLY CLOSED-NORMALLY CLOSED NEUTRAL POSITION, NBR SEALS

NPT Pipe Size	Orifice Diameters								*Maximum Operating Pressure Diff. (PSI)	Class B Molded Leaded Coil	Const. Ref.
	Valve #1 (NC)				Valve #2 (NC)						
	Inlet Port	Cv Factor	Exhaust Port	Cv Factor	Inlet Port	Cv Factor	Exhaust Port	Cv Factor			
1/4"	3/64	0.052	1/16	0.095	3/64	0.052	1/16	0.095	150 (200)	V933LB2150	59
	1/16	0.095	3/32	0.14	1/16	0.095	3/32	0.14	100 (125)	V933LB2100	59
	3/32	0.16	3/32	0.14	3/32	0.16	3/32	0.14	75 (90)	V933LB2075	59
	1/8	0.21	3/32	0.14	1/8	0.21	3/32	0.14	50 (65)	V933LB2050	59

V935 PILOT OPERATED ZINC VALVES–NORMALLY CLOSED-NORMALLY OPEN NON-NEUTRAL POSITION, NBR SEALS

NPT Pipe Size	Orifice Diameters								*Maximum Operating Pressure Diff. (PSI)	Class B Molded Leaded Coil	Const. Ref.
	Valve #1 (NC)				Valve #2 (NO)						
	Inlet Port	Cv Factor	Exhaust Port	Cv Factor	Inlet Port	Cv Factor	Exhaust Port	Cv Factor			
1/4"	3/64	0.052	1/16	0.095	3/64	0.052	1/16	0.095	150 (200)	V935LB2150	59
	1/16	0.095	3/32	0.14	1/16	0.08	1/8	0.18	100 (125)	V935LB2100	59
	3/32	0.16	3/32	0.14	3/32	0.14	1/8	0.21	75 (90)	V935LB2075	59
	1/8	0.21	3/32	0.14	3/32	0.14	1/8	0.21	50 (65)	V935LB2050	59

V955 PILOT OPERATED ZINC VALVES–NORMALLY OPEN-NORMALLY OPEN NEUTRAL POSITION, NBR SEALS

NPT Pipe Size	Orifice Diameters								*Maximum Operating Pressure Diff. (PSI)	Class B Molded Leaded Coil	Const. Ref.
	Valve #1 (NO)				Valve #2 (NO)						
	Inlet Port	Cv Factor	Exhaust Port	Cv Factor	Inlet Port	Cv Factor	Exhaust Port	Cv Factor			
1/4"	3/64	0.052	1/16	0.095	3/64	0.052	1/16	0.095	150 (225)	V955LB2150	59
	1/16	0.08	1/8	0.18	1/16	0.08	1/8	0.18	100 (150)	V955LB2100	59
	3/32	0.14	1/8	0.18	3/32	0.14	1/8	0.21	75 (100)	V955LB2075	59

V933 PILOT OPERATED ZINC VALVES–NORMALLY CLOSED-NORMALLY CLOSED NEUTRAL POSITION–WITH ADJUSTABLE FLOW OPTION, NBR SEALS

NPT Pipe Size	Orifice Diameters								*Maximum Operating Pressure Diff. (PSI)	Class B Molded Leaded Coil			Const. Ref.
	Valve #1 (NC)				Valve #2 (NC)					Adjustable Flow At Both Exhausts	Adjustable Flow At Both Inlets	Full Adjustable Flow At Both Exhausts & Inlets	
	Inlet Port	Cv Factor	Exhaust Port	Cv Factor	Inlet Port	Cv Factor	Exhaust Port	Cv Factor					
1/4"	3/64	0.052	1/16	0.095	3/64	0.052	1/16	0.095	150 (200)	V933LEH2150	V933LEP2150	V933LEF2150	59
	1/16	0.105	3/32	0.13	1/16	0.105	3/32	0.13	100 (125)	V933LEH2100	V933LEP2100	V933LEF2100	59
	3/32	0.13	3/32	0.13	3/32	0.13	3/32	0.13	75 (90)	V933LEH2075	V933LEP2075	V933LEF2075	59
	1/8	0.16	3/32	0.13	1/8	0.16	3/32	0.13	50 (65)	V933LEH2050	V933LEP2050	V933LEF2050	59

* *Figures in parentheses indicate higher than standard pressure ratings available with slight modifications.*

V935 PILOT OPERATED ZINC VALVES – NORMALLY CLOSED – NORMALLY OPEN NON-NEUTRAL POSITION – WITH ADJUSTABLE FLOW OPTION, NBR SEALS

NPT Pipe Size	Orifice Diameters: Valve #1 (NC) Inlet Port	Valve #1 (NC) Cv Factor	Valve #1 (NC) Exhaust Port	Valve #1 (NC) Cv Factor	Valve #2 (NO) Inlet Port	Valve #2 (NO) Cv Factor	Valve #2 (NO) Exhaust Port	Valve #2 (NO) Cv Factor	*Maximum Operating Pressure Diff. (PSI)	Class B Molded Leaded Coil: Adjustable Flow At Both Exhausts	Adjustable Flow At Both Inlets	Full Adjustable Flow At Both Exhausts & Inlets	Const. Ref.
1/4"	3/64	0.052	1/16	0.095	3/64	0.052	1/16	0.095	150 (200)	V935LEH2150	V935LEP2150	V935LEF2150	59
	1/16	0.105	3/32	0.13	1/16	0.08	1/8	0.16	100 (125)	V935LEH2100	V935LEP2100	V935LEF2100	59
	3/32	0.13	3/32	0.13	3/32	0.13	1/8	0.16	75 (90)	V935LEH2075	V935LEP2075	V935LEP2075	59
	1/8	0.16	3/32	0.13	3/32	0.13	1/8	0.16	50 (65)	V935LEH2050	V935LEP2050	V935LEP2050	59

V955 PILOT OPERATED ZINC VALVES – NORMALLY OPEN-NORMALLY OPEN NEUTRAL POSITION – WITH ADJUSTABLE FLOW OPTION, NBR SEALS

NPT Pipe Size	Orifice Diameters: Valve #1 (NO) Inlet Port	Valve #1 (NO) Cv Factor	Valve #1 (NO) Exhaust Port	Valve #1 (NO) Cv Factor	Valve #2 (NO) Inlet Port	Valve #2 (NO) Cv Factor	Valve #2 (NO) Exhaust Port	Valve #2 (NO) Cv Factor	*Maximum Operating Pressure Diff. (PSI)	Class B Molded Leaded Coil: Adjustable Flow At Both Exhausts	Adjustable Flow At Both Inlets	Full Adjustable Flow At Both Exhausts & Inlets	Const. Ref.
1/4"	3/64	0.052	1/16	0.095	3/64	0.052	1/16	0.095	150 (225)	V955LEH2150	V955LEP2150	V955LEF2150	59
	1/16	0.08	1/8	0.16	1/16	0.08	1/8	0.16	100 (150)	V955LEH2100	V955LEP2100	V955LEF2100	59
	3/32	0.13	1/8	0.16	3/32	0.13	1/8	0.16	75 (100)	V955LEH2075	V955LEP2075	V955LEF2075	59

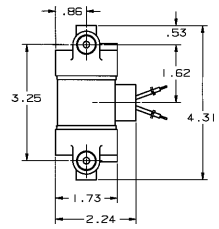
* *Figures in parentheses indicate higher than standard pressure ratings available with slight modifications.*

Valve Options & Accessories

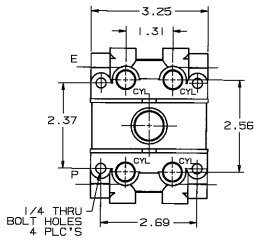
Optional Features	Option Code
Class H molded leaded coil	LH

For ordering instructions see Ordering Information section on page 10.

DRAWINGS



Note: Enclosure and adjustable flow designators (B, EH, EPOR EF) have been omitted for brevity.



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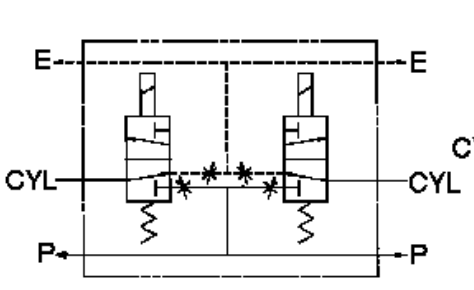
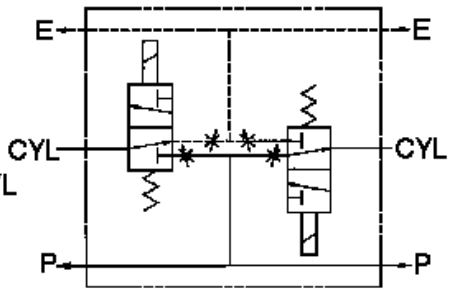
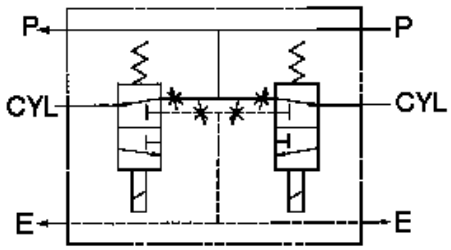


Four-Way Normally Closed-Normally Closed



Four-Way Normally Closed-Normally Open



Four-Way Normally Open-Normally Open