

Air Operated Valves vs. Electric Valves



Syringe Pump Technical Bulletin TB49

A *valve* is an element that allows the exchange of fluid or gas between two systems or two parts of a system. A valve can be used to control the direction of flow or the amount of flow.

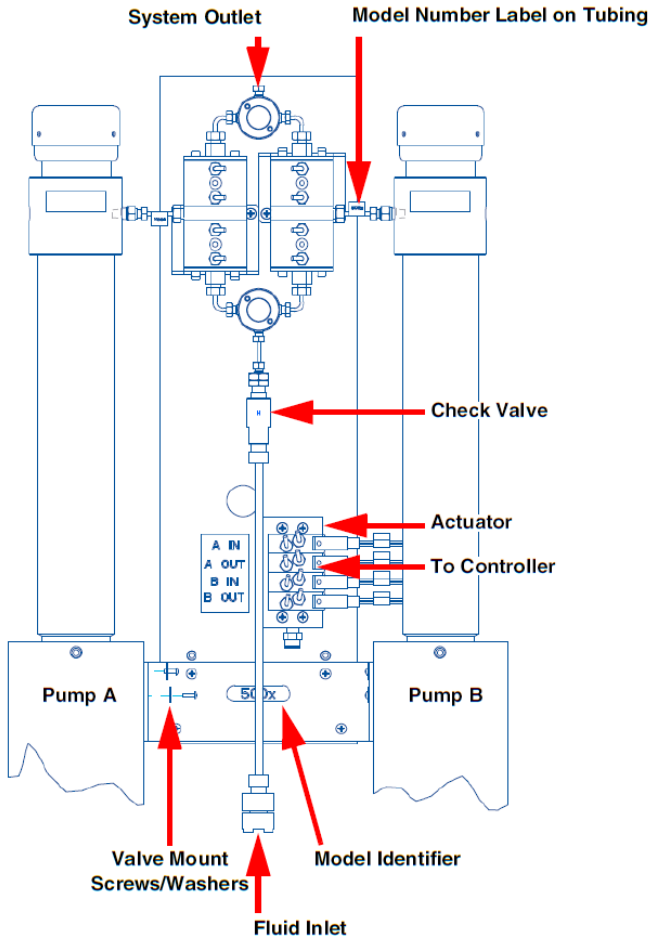
The Dual Valve package for the SyriXus pump system allows for continuous deliver of fluid during experiments. The valve package is regulated by the controller and synchronized with the pump cylinder to offer pulseless delivery during cylinder transfer.

Teledyne ISCO offers two types of continuous dual valve systems: air operated valves and electric valves. The following table summarized the differences between electric and air operated valves.

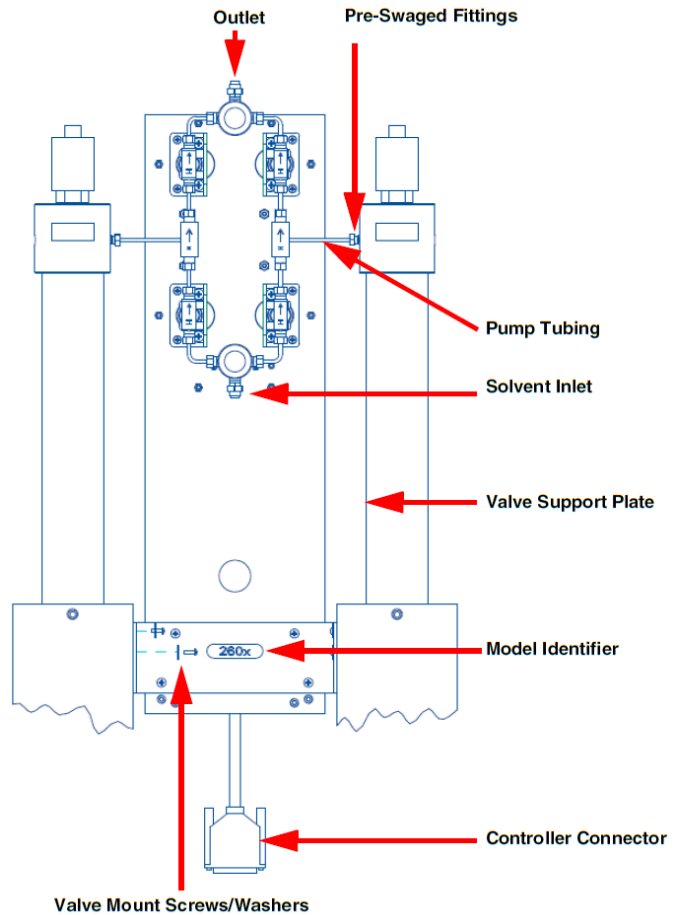
When operating the SyriXus pumps in continuous flow mode with either the air or electric valve package, the pumps are limited to 65% of the syringe pump maximum flow rate for liquids and 45% of the maximum flow rate for liquefied gases. This is due to the compressibility of the pumped material and the need to obtain a pulseless conversion between cylinders.

	Air Valves	Electric Valves		
Power Source	Powered by SyriXus control module	Powered by SyriXus control module		
Air Source	80-115 psi air source	None		
Pressure pulse at switchover	5 psi (0.35 bar) at system back pressure of 100 psi (6.9 bar) to pump max pressure. Higher fluctuations occurs at pressures below 100 psi.			
Minimum required backpressure	50.76 psi (3.5 bar)	50.76 psi (3.5 bar)		
Maximum system backpressure	The single-pump maximum. Valves rated to 10,000 psi [689.5 bar]			
Maximum flow rate (mL/min) Liquids: 65% of the single-pump maximum rate	1000x	265.2	1000x	132.6
	500xv	132.6	500x	132.6
	500x	132.6	260x	69.55
	260x	69.55		
	65x	19.50		
Temperature	320° F fluid temp, 150° F valve temp		300° F fluid temp, 150° F valve temp	
Cost	\$\$		\$	
Valve Wetted Materials	Hastelloy, FFKM elastomer, PTFE		Hastelloy, silicon nitride, Inconel, Vespel	
Applications	Zero displacement applications Zero pulsation during cylinder change Sparkless--recommended for flammable applications Not recommended for liquefied gasses--seals may fail under depressurization Class I Div II Hazardous Location Certified Suited for continuous use or industrial applications		Convenient for non-flammable lab applications Positive valve closure for liquefied gasses Supercritical CO ₂ applications	

Pump options	1000x 500x 500xv 260x 65x	1000HLf 500HLf 260HLf 100HLf	1000x 500x 260x
Valve Controller Options	Basic Controller 4-20 mA Controller		Electric Valve Controller



Air operated dual continuous valves configuration



Electric dual continuous valve configuration

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Teledyne ISCO is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.

August 24, 2023