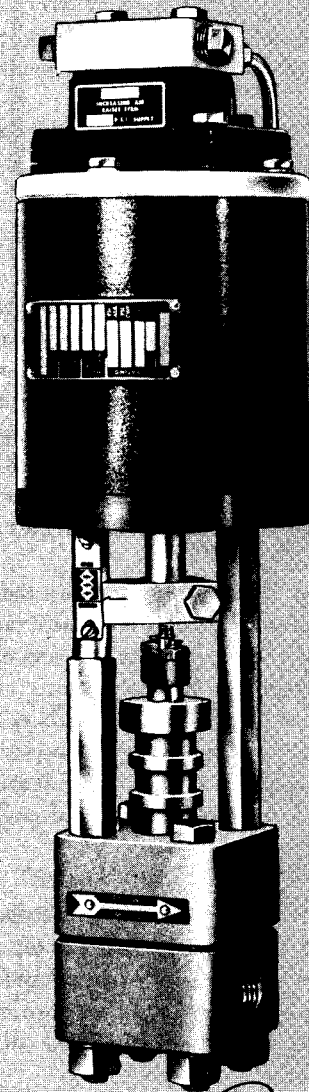


9460 Series Small Flow Control Valves

globe and angle



Annin

Masoneilan **DRESSER**

Model 9460, 9461 control valves feature a high speed, positioning actuator and selection of quick-change trim

Foreword

Model 9460, 9461 control valves are suitable for a wide range of low flow, high pressure applications. They utilize a differential area piston actuator which requires no loading regulator. An integral, top mounted positioner strokes the valve in less than one second. Valves are available with globe (Model 9460) or angle (Model 9461) bodies. Packing box design permits handling fluids at temperatures from -20°F to $+750^{\circ}\text{F}$. Lower section of bodies may be rotated in increments of 90° for piping convenience.

These valves may be supplied without a positioner for on-off applications.

Operation

Air-to-open (stem retracts on increased signal)

On an actuator supplied with a direct action positioner, air or gas at a pressure of 30—100 psi enters the positioner supply port. This supply pressure is also piped to the upper (or smaller area) side of the piston. The controller signal pressure acts within the positioner double diaphragm assembly. In this assembly, the area of the upper diaphragm is smaller than the area of the lower diaphragm. Positioner output pressure is connected to the lower or larger area on the underside of the piston.

An increase in controller signal pressure causes the double diaphragm assembly to move down. This movement causes the positioner pilot valve to close the exhaust port and open the supply port to increase positioner output pressure under the piston, retracting the piston rod. The piston continues to move until the force exerted by the range spring balances the force exerted by the double diaphragm assembly. Positioner output then stabilizes to maintain the desired piston rod position.

Air-to-close (stem extends on increased signal)

On an actuator supplied with a reverse action positioner, the larger area diaphragm of the positioner is at the top. Also, a small spring is located on top of the larger area diaphragm to bias the positioner pilot valve toward the open position when minimum instrument signal pressure is exerted within the double diaphragm assembly.

An increase in controller signal causes the positioner double diaphragm assembly to move up. This movement causes the positioner pilot valve to open the exhaust port and close the supply port to exhaust air from under the piston, extending the piston rod. The piston continues to move until the force exerted by the bias spring is equal to the combined range-spring and controller signal pressure forces. Positioner output then stabilizes to maintain the desired piston rod position.

Specifications

actuator

<i>type:</i>	positioning pneumatic cylinder with integral positioner
<i>action:</i>	air-to-retract stem or air-to-extend stem
<i>stem travel:</i>	$\frac{1}{2}''$
<i>supply:</i>	30, 60 or 100 psi
<i>signal:</i>	3-15 psi or as specified
<i>connections:</i>	$\frac{1}{4}''$ NPT

body

<i>type:</i>	cast, split-globe or angle
<i>material:</i>	carbon steel, Type 304 or 316 stainless steel, Monel, Hastelloy B or C; others available
<i>sizes:</i>	$\frac{1}{4}''$, $\frac{3}{8}''$ and $\frac{1}{2}''$
<i>connections:</i>	threaded, others available
<i>rating:</i>	ANSI Class 2500
<i>temperature range:</i>	-20°F to $+750^{\circ}\text{F}$
<i>packing box:</i>	bolted
<i>packing:</i>	Teflon V-ring
<i>gasket:</i>	Teflon

trim

<i>type:</i>	linear — all sizes percentage — C_v 1.0, 1.5 and 2.5
<i>material:</i>	Type 304 or 316 stainless steel, Monel, Hastelloy B or C; others available

flow coefficients*

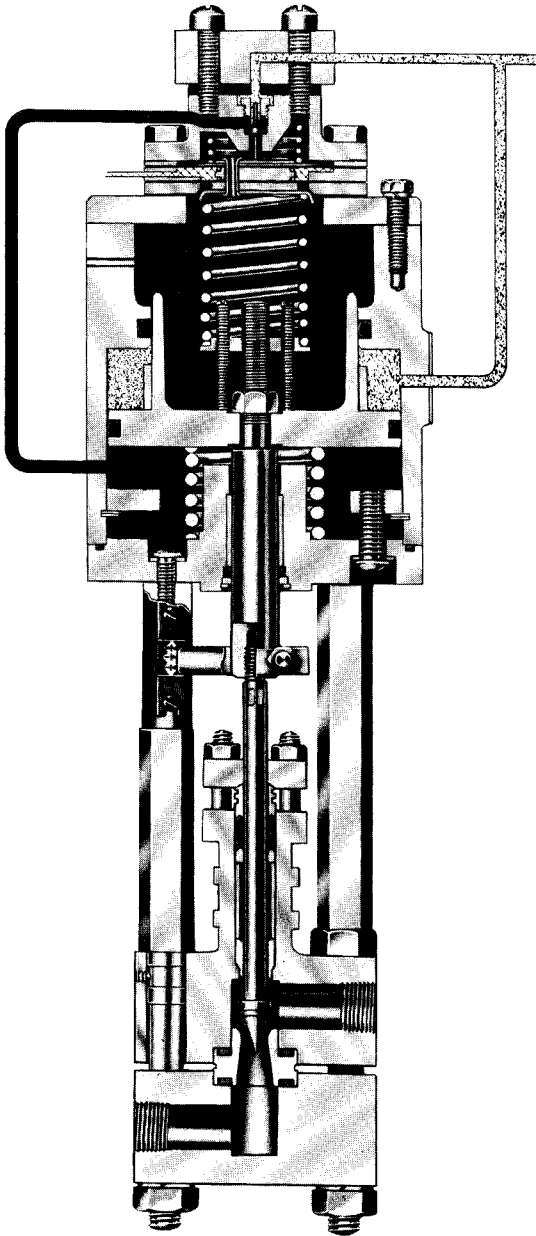
C_v :	.003, .008, .020, .030, .045, .075, .12, .20, .34, .55, 1.0, 1.5, 2.5
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*Available for all sizes except: $\frac{1}{4}''$ valve, maximum C_v is 1.0; $\frac{3}{8}''$ valve, maximum C_v is 1.5

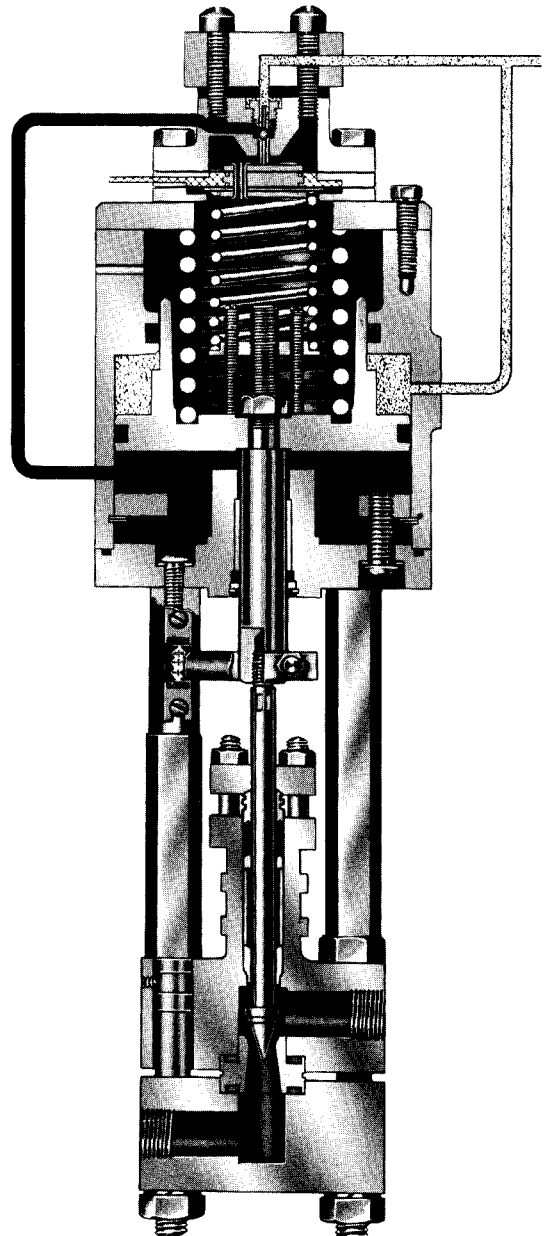
model numbers

model numbers	body series	actuator	body type
9460	94	positioning cylinder	globe
9461			angle

Note: For on-off applications, Models 9420 and 9421 available. Specifications on request.



globe body — air-to-close



globe body — air-to-open
 (shown with optional spring for positive fail-closed action)

 **controller signal**

 **positioner output**

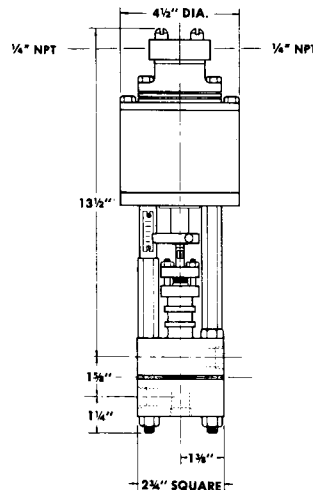
 **supply pressure**

Pressure drop limitations and dimensions

To assure satisfactory operation under all conditions, the pressure drop must be taken as inlet to 0. The following tables are based on this fact.

The pressure drops given are independent of ANSI pressure-temperature ratings. Where allowable pressure drops exceed ANSI ratings, the ANSI limitations must govern. Air-to-close actuators are provided with a spring under the piston for fail-open action. Air-to-open actuators can be supplied with a spring above the piston to ensure fail-closed action where desired.

For services requiring combinations of flow direction, actuator action, and air failure action other than those shown, submit full details for engineering review and recommendations.



Flow tending to open air-to-close action

rated C_v	valve size	stroke	controller signal (psi)	Throttling		
				30 psi supply	60 psi supply	100 psi supply
2.5	1/2	1/2	3-15	200	1250	2600
1.5	3/8, 1/2	1/2	3-15	350	2100	4450
1.0	1/4, 3/8, 1/2	1/2	3-15	350	2100	4450
.55		1/2	3-15	200	1150	2350
.34		1/2	3-15	200	1100	2350
.20		1/2	3-15	400	2350	4950
.12		1/2	3-15	200	1250	2650
.075, .045, .030, .020, .008, .003		1/2	3-15	500	2750	5750

Flow tending to close air-to-open action

rated C_v	valve size	stroke	controller signal (psi)	Throttling					
				30 psi supply	60 psi supply		100 psi supply		
				springless cylinder	springless cylinder	cyl. with low rate spring	springless cylinder	cyl. with low rate spring	cyl. with high rate spring
2.5	1/2	1/2	3-15	1750	3500	1900	5850	1950	2700
1.5	3/8, 1/2	1/2	3-15	2350	4750	1950	6000	1950	3900
1.0	1/4, 3/8, 1/2	1/2	3-15	2350	4750	1950	6000	1950	3900
.55		1/2	3-15	1500	3050	1650	5100	1950	2350
.34		1/2	3-15	1500	3000	1650	5000	1950	2300
.20		1/2	3-15	2350	4750	1950	6000	1950	3900
.12		1/2	3-15	1800	3600	1950	6000	1950	2750
.075, .045, .030, .020, .008, .003		1/2	3-15	2350	4750	1950	6000	1950	3900