

# Valve Products

Research Control® Valves

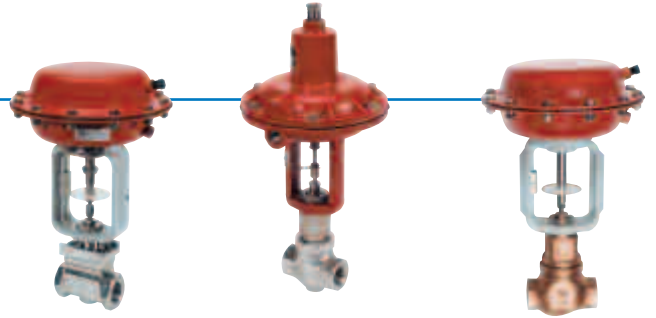


BadgerMeter, Inc.

# Badger® Valve Products

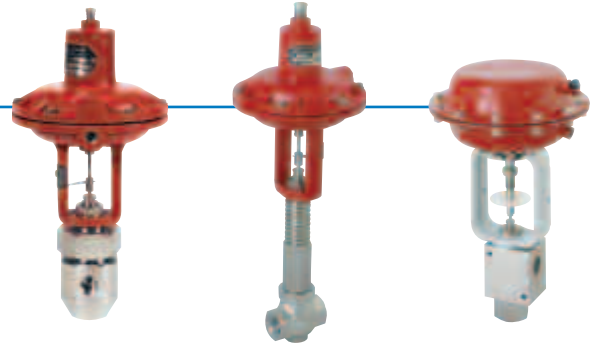
## *General Industrial*

Compact valves and magnetic flowmeters for a wide spectrum of low flow processes, from research projects and pilot plants to full production runs.



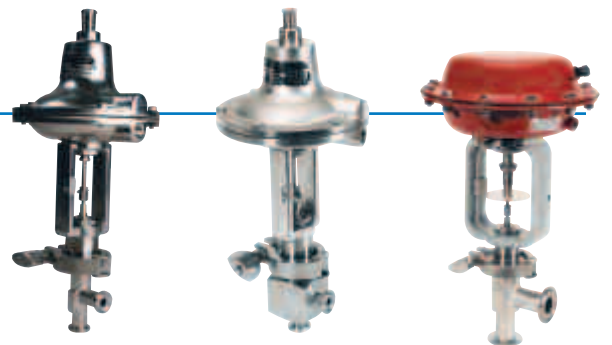
## *Petrochemical*

Steadfast control under high pressure, including petroleum refining, hydrate prevention, synthetic fuels, lubricants, and chemicals.



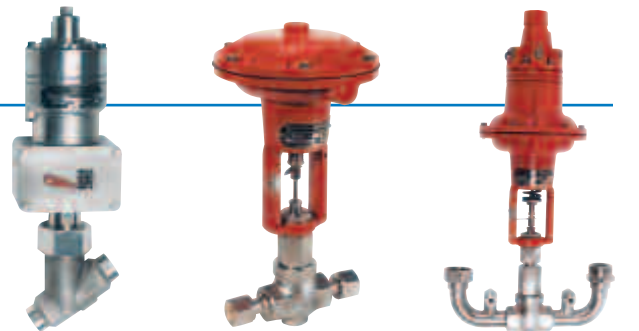
## *Sanitary/Pharmaceutical*

Valves and magnetic flowmeters in full compliance with 3A Symbol Council standards for foods, beverages, and pharmaceuticals.



## *Specialty*

Innovative custom solutions for your most perplexing applications.





## Table of Contents

### Standard RESEARCH CONTROL® Valves

(Sizes 1/4" thru 1", Cv's to 6.0) . . . . . **Pages 4 & 5**

### High Pressure Control Valves

(5,000 psig and up, Sizes 1/4" thru 1",  
Cv's up to 6.0) . . . . . **Pages 6 & 7**

### Sanitary Control Valves

(Sizes 1/2" thru 2", Cv's up to 60) . . . . . **Pages 8 & 9**

### Model 9000 Control Valves & Model 9100 Bronze Control Valves

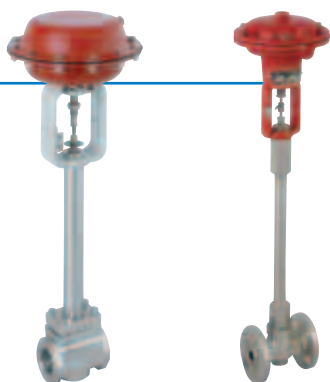
( Model 9000 SST and Alloy C, 1" thru 2", Cv's up  
to 25 and Model 9100 1/2" thru 2",  
Cv's up to 54) . . . . . **Pages 10 & 11**

### Accessories

(Positioners, Regulators, i/p's, etc.) . . . . . **Back Page**

### **Cryogenics**

High accuracy for extremely cold fluids and gases.



### **Water Treatment/ Chemical Additives**

Penny-pinching management of costly low flow additives used in your water treatment and other processes.



## From Standard to One-of-a-Kind — and Everything in Between

For precision control of your low flow processes, turn to the **advanced technologies** and low flow experts at Badger Meter. We will help you achieve the accuracy you need for your most critical applications with a **full range of performance-tested solutions**. Many are ready to assemble and deliver from our **extensive inventory** of components, accessories and materials. Need something special? Our **application-savvy R&D team** can create a custom design for your unique requirement, however exotic it may be. You'll be delighted at Badger's **quality, expertise, service and economy-minded creativity**.



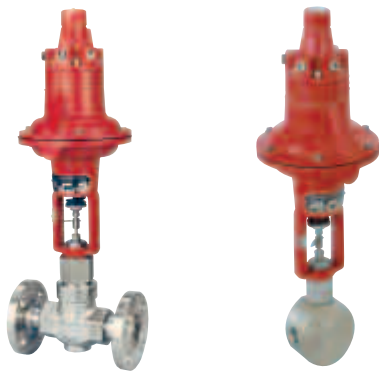
## Standard RESEARCH CONTROL® Valves

### Applications

The Type 807/752 valve is widely used in industrial applications, research, and process pilot plants on liquids, gases or steam to control fractional flows in 1/4", 1/2", 3/4" and 1" pipe. Its compact size makes it an ideal choice for additive injection, sampling, or low flow hydraulic systems. It is recommended for use wherever precise control is an important factor or where physical constraints limit valve weight or size.



*Type 807/752 with Type 754 Actuator*



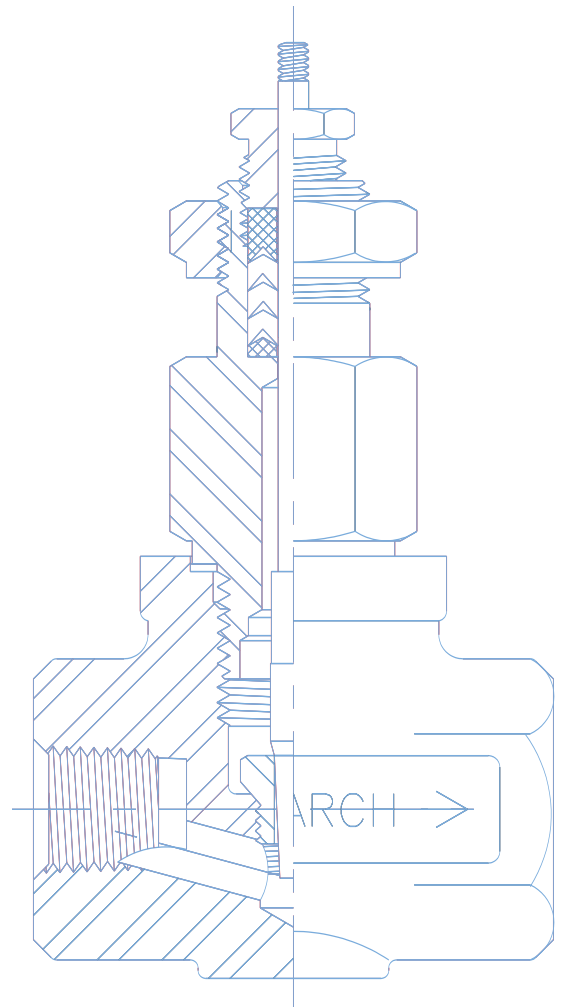
*Flanged and Barstock versions available*

### Standard Features

- Choice of 38 standard interchangeable trim sizes
- Threaded bonnet for quick disassembly
- Choice of linear, equal percentage and quick opening trim characterization on trim size "J" and larger
- TFE chevron packing
- ANSI Class IV shutoff (size "O" and larger)

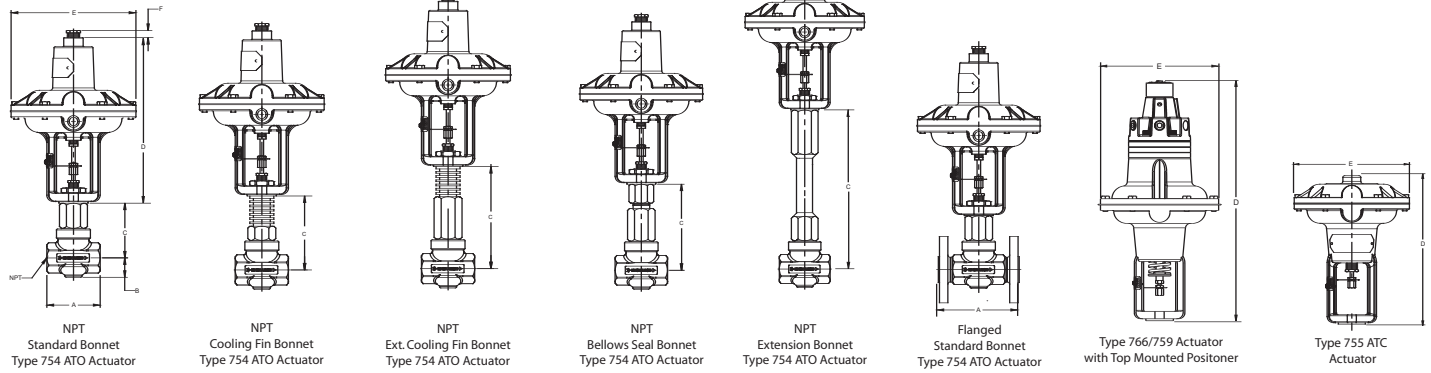
### Optional Features

- Flange sizes up to 1-1/2", socket weld, butt-weld nipples
- Cooling fin bonnet for higher temperatures
- Bellows stem seal
- Angle pattern body
- Graphite or Kalrez® packing
- Extended bonnet for cryogenic applications
- Barstock bodies in exotic materials





## Dimensions



BODY SIZE	End Connections					Bonnet					Actuator					
	NPT	Class 150 RF	Class 300 RF	Class 600 RF	Cast Body	Standard	Cooling Fin	Ext Cooling Fin	Bellows Seal	Extension	754 ATO	755 ATC	766 w/BLRA	759 w/TLDA	ALL	ATO (Max)
	"A"	"A"	"A"	"A"	"B"	"C"	"C"	"C"	"C"	"C"	"D"	"D"	"D"	"D"	"E"	"F"
1/4"	2.12 in.	NA	NA	NA	0.68 in.	1.87 in.	2.56 in.	4.00 in.	4.15 in.	14.00 in.	6.64 in.	6.58 in.	12.47 in.	12.51 in.	5.12 in.	0.31 in.
1/4"	53.85 mm	NA	NA	NA	17.27 mm	47.50 mm	65.02 mm	101.60 mm	105.41 mm	355.60 mm	168.66 mm	167.13 mm	316.74 mm	317.75 mm	130.05 mm	7.87 mm
1/2"	2.75 in.	4.25 in.	6.00 in.	6.50 in.	1.00 in.	2.85 in.	3.83 in.	6.00 in.	4.56 in.	14.00 in.	8.55 in.	8.30 in.	13.93 in.	13.98 in.	6.43 in.	0.37 in.
1/2"	69.85 mm	107.95 mm	152.40 mm	165.10 mm	25.40 mm	72.38 mm	97.28 mm	152.40 mm	115.82 mm	355.60 mm	217.17 mm	210.82 mm	353.82 mm	355.09 mm	163.32 mm	9.40 mm
3/4"	3.37 in.	7.25 in.	7.62 in.	8.12 in.	1.18 in.	3.84 in.	3.84 in.	6.00 in.	4.76 in.	14.00 in.	8.55 in.	8.30 in.	13.93 in.	13.98 in.	6.43 in.	0.37 in.
3/4"	85.60 mm	184.15 mm	193.55 mm	206.25 mm	29.97 mm	97.54 mm	97.54 mm	152.40 mm	120.90 mm	355.60 mm	217.17 mm	210.82 mm	353.82 mm	355.09 mm	163.32 mm	9.40 mm
1"	4.00 in.	7.25 in.	7.75 in.	8.25 in.	1.50 in.	3.95 in.	3.95 in.	6.00 in.	4.88 in.	14.00 in.	8.55 in.	8.30 in.	13.93 in.	13.98 in.	6.43 in.	0.37 in.
1"	101.60 mm	184.15 mm	196.85 mm	209.55 mm	38.10 mm	100.33 mm	100.33 mm	152.40 mm	123.95 mm	355.60 mm	217.17 mm	210.82 mm	353.82 mm	355.09 mm	163.32 mm	9.40 mm
Tech Brief Reference	807752	860	860	860	807752 860	807	859	973	808	884	754	755	766	759		754

## Trim Chart

Size	Trim	Max Cv	Orifice Dia. (in)	Orifice Area(sq in)	Nominal Rangeability	
					Linear	Equal %
1"	6.0	6.0	0.6250	0.3068	50:1	60:1
1"	5.0	5.0	0.6250	0.3068	50:1	60:1
1"	4.5	4.5	0.5000	0.1963	50:1	60:1
3/4"-1"	4.0	4.0	0.4375	0.1503	50:1	60:1
3/4"-1"	3.5	3.5	0.4375	0.1503	50:1	60:1
1/2"-1"	A	2.5	0.3750	0.1104	40:1	50:1
1/2"-1"	B	2.0	0.3750	0.1104	40:1	50:1
1/2"-1"	C	1.25	0.2810	0.0620	40:1	50:1
1/2"-1"	D	0.8	0.2500	0.0491	40:1	50:1
1/2"-1"	E	0.5	0.2500	0.0491	40:1	50:1
1/4"-1"	F	0.32	0.1560	0.0191	30:1	40:1
1/4"-1"	G	0.2	0.1560	0.0191	30:1	40:1
1/4"-1"	H	0.13	0.1560	0.0191	30:1	40:1
1/4"-1"	I	0.08	0.1560	0.0191	30:1	40:1
1/4"-1"	J	0.05	0.1560	0.0191	30:1	40:1
1/4"-1"	K	0.03	0.0860	0.0058	25:1	NA
1/4"-1"	L	0.02	0.0860	0.0058	25:1	NA
1/4"-1"	M	0.01	0.0860	0.0058	25:1	NA
1/4"-1"	N	0.006	0.0860	0.0058	25:1	NA
1/4"-1"	O	0.003	0.0860	0.0058	25:1	NA
1/4"-1/2"	P1	0.002	0.0625	0.0031	15:01	NA
1/4"-1/2"	P2	0.0013	0.0625	0.0031	15:01	NA
1/4"-1/2"	P3	0.001	0.0625	0.0031	15:01	NA
1/4"-1/2"	P4	0.0006	0.0625	0.0031	15:01	NA
1/4"-1/2"	P5	0.0004	0.0625	0.0031	15:01	NA
1/4"-1/2"	P6	0.00027	0.0625	0.0031	15:01	NA
1/4"-1/2"	P7	0.00018	0.0625	0.0031	15:01	NA
1/4"-1/2"	P8	0.00012	0.0625	0.0031	15:01	NA
1/4"-1/2"	P9	0.00008	0.0625	0.0031	15:01	NA
1/4"	P10	0.00005	0.0420	0.0014	15:01	NA
1/4"	P11	0.000036	0.0420	0.0014	15:01	NA
1/4"	P12	0.000024	0.0420	0.0014	15:01	NA
1/4"	P13	0.000016	0.0420	0.0014	15:01	NA
1/4"	P14	0.00001	0.0420	0.0014	15:01	NA
1/4"	P15	0.000006	0.0420	0.0014	15:01	NA
1/4"	P16	0.000004	0.0420	0.0014	15:01	NA
1/4"	P17	0.0000027	0.0420	0.0014	15:01	NA
1/4"	P18	0.0000018	0.0420	0.0014	15:01	NA

## Pressure vs. Temperature

Valve Size	Temperature F (C)	316/316L PSIG (BARG)		Carbon Steel PSIG (BARG)		Hastelloy B PSIG (BARG)		Hastelloy C PSIG (BARG)		Monel PSIG (BARG)		Alloy 20 PSIG (BARG)		
		PSIG	BARG	PSIG	BARG	PSIG	BARG	PSIG	BARG	PSIG	BARG	PSIG	BARG	
1/4"	100 [37.8]	5000 [345]	4000 [276]	5000 [345]	5000 [345]	4000 [276]	5000 [345]	4000 [276]	5000 [345]	5000 [345]	3880 [268]	4850 [334]	4850 [334]	
	200 [93.3]	5000 [345]	3700 [255]	5000 [345]	5000 [345]	4000 [276]	5000 [345]	4000 [276]	5000 [345]	4000 [276]	3780 [261]	4600 [317]	4600 [317]	
	300 [148.9]	4750 [328]	3500 [241]	5000 [345]	5000 [345]	3500 [241]	4750 [328]	4750 [328]	4750 [328]	4750 [328]	3580 [248]	4300 [297]	4300 [297]	
	400 [204.4]	4190 [289]	3200 [221]	5000 [345]	5000 [345]	3200 [221]	4190 [289]	4190 [289]	4190 [289]	4190 [289]	3200 [221]	4000 [276]	4000 [276]	
	500 [260.0]	4000 [276]	2900 [200]	4900 [338]	4900 [338]	2900 [200]	4000 [276]	4000 [276]	4000 [276]	4000 [276]	2900 [200]	3700 [258]	3700 [258]	
	600 [315.6]	3820 [263]	2600 [179]	4850 [334]	4850 [334]	2600 [179]	3820 [263]	3820 [263]	3820 [263]	3820 [263]	2600 [179]	3400 [234]	3400 [234]	
	700 [371.1]	3640 [251]	2300 [159]	4800 [331]	4800 [331]	2300 [159]	3640 [251]	3640 [251]	3640 [251]	3640 [251]	2300 [159]	3200 [221]	3200 [221]	
	800 [426.7]	3580 [247]		4750 [328]	4750 [328]		3580 [247]	3580 [247]	3580 [247]	3580 [247]		3100 [214]	3100 [214]	
	900 [482.2]	2840 [196]					2840 [196]	2840 [196]	2840 [196]	2840 [196]		2840 [196]	2840 [196]	2840 [196]
	1000 [537.8]	1160 [80]					1160 [80]	1160 [80]	1160 [80]	1160 [80]		1160 [80]	1160 [80]	1160 [80]
	1100 [593.3]											3500 [241]	3500 [241]	3500 [241]
	1200 [648.9]											3000 [207]	3000 [207]	3000 [207]
1/2"	100 [37.8]	5000 [345]	4000 [276]	5000 [345]	5000 [345]	4000 [276]	5000 [345]	4000 [276]	5000 [345]	5000 [345]	3880 [268]	4850 [334]	4850 [334]	
	200 [93.3]	4750 [328]	3800 [262]	5000 [345]	5000 [345]	3800 [262]	4750 [328]	4750 [328]	4750 [328]	4750 [328]	3580 [248]	4300 [297]	4300 [297]	
	300 [148.9]	4310 [297]	3600 [248]	5000 [345]	5000 [345]	3600 [248]	4310 [297]	4310 [297]	4310 [297]	4310 [297]	3520 [243]	4000 [276]	4000 [276]	
	400 [204.4]	3660 [252]	3300 [228]	5000 [345]	5000 [345]	3300 [228]	3660 [252]	3660 [252]	3660 [252]	3660 [252]	3420 [236]	4000 [276]	4000 [276]	
	500 [260.0]	3640 [251]	3100 [214]	4900 [338]	4900 [338]	3100 [214]	3640 [251]	3640 [251]	3640 [251]	3640 [251]	3390 [234]	4000 [276]	4000 [276]	
	600 [315.6]	3470 [239]	2900 [200]	4870 [336]	4870 [336]	2900 [200]	3470 [239]	3470 [239]	3470 [239]	3470 [239]	2900 [200]	3700 [258]	3700 [258]	
	700 [371.1]	3310 [228]	2700 [186]	4610 [318]	4610 [318]	2700 [186]	3310 [228]	3310 [228]	3310 [228]	3310 [228]	2700 [186]	3400 [234]	3400 [234]	
	800 [426.7]	3255 [224]		4430 [306]	4430 [306]		3255 [224]	3255 [224]	3255 [224]	3255 [224]		3200 [221]	3200 [221]	
	900 [482.2]	3190 [220]					3190 [220]	3190 [220]	3190 [220]	3190 [220]		3100 [214]	3100 [214]	3100 [214]
	1000 [537.8]	1860 [128]					1860 [128]	1860 [128]	1860 [128]	1860 [128]		2090 [144]	2090 [144]	2090 [144]
	1100 [593.3]											4000 [276]	4000 [276]	4000 [276]
	1200 [648.9]											3400 [234]	3400 [234]	3400 [234]
3/4"	100 [37.8]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1100 [76]	1100 [76]	1100 [76]	
	200 [93.3]	1450 [100]	1350 [93]	1450 [100]	1450 [100]	1350 [93]	1450 [100]	1450 [100]	1450 [100]	1450 [100]	1100 [76]	1100 [76]	1100 [76]	
	300 [148.9]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1100 [76]	1100 [76]	1100 [76]	
	400 [204.4]	1175 [81]	1275 [88]	1175 [81]	1175 [81]	1275 [88]	1175 [81]	1175 [81]	1175 [81]	1175 [81]	1100 [76]	1100 [76]	1100 [76]	
	500 [260.0]	1100 [76]	1200 [83]	1100 [76]	1100 [76]	1200 [83]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	
	600 [315.6]	1050 [72]	1100 [76]	1050 [72]	1050 [72]	1100 [76]	1050 [72]	1050 [72]	1050 [72]	1050 [72]	1100 [76]	1100 [76]	1100 [76]	
	700 [371.1]	840 [58]	1075 [74]	840 [58]	840 [58]	1075 [74]	840 [58]	840 [58]	840 [58]	840 [58]	1075 [74]	1075 [74]	1075 [74]	
	800 [426.7]	575 [40]		575 [40]	575 [40]		575 [40]	575 [40]	575 [40]	575 [40]		1075 [74]	1075 [74]	
1"	100 [37.8]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1500 [103]	1100 [76]	1100 [76]	1100 [76]	
	200 [93.3]	1450 [100]	1350 [93]	1450 [100]	1450 [100]	1350 [93]	1450 [100]	1450 [100]	1450 [100]	1450 [100]	1100 [76]	1100 [76]	1100 [76]	
	300 [148.9]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1325 [91]	1100 [76]	1100 [76]	1100 [76]	
	400 [204.4]	1175 [81]	1275 [88]	1175 [81]	1175 [81]	1275 [88]	1175 [81]	1175 [81]	1175 [81]	1175 [81]	1100 [76]	1100 [76]	1100 [76]	
	500 [260.0]	1100 [76]	1200 [83]	1100 [76]	1100 [76]	1200 [83]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	1100 [76]	
	600 [315.6]	675 [47]	1100 [76]	675 [47]	675 [47]	1100 [76]	675 [47]	675 [47]	675 [47]	675 [47]	1100 [76]	1100 [76]	1100 [76]	
	700 [371.1]	250 [17]	1075 [74]	250 [17]	250 [17]	1075 [74]	250 [17]	250 [17]	250 [17]	250 [17]	1075 [74]	1075 [74]	1075 [74]	



# High Pressure Control Valves

## Applications

RESEARCH CONTROL® offers many different high pressure valves suited for applications in chemical, petroleum and other industries requiring a rugged, compact, heavy duty valve. Available in globe and angle body patterns with pressures ranging from 7,000 psig (517 bar) to 60,000 psig (4,138 bar).

Applications include:

- Initiator flow control into a reactor
- Corrosion and hydrate inhibitor injection in offshore natural gas production
- Gas injection (gas lift) in offshore oil production
- Sampling systems requiring low dead volumes
- Blowing agents in molding processes
- Flow control in mass controller applications
- Filling of high pressure cylinders



High Pressure Valve



High Pressure Control Valves

## Pressure Ratings

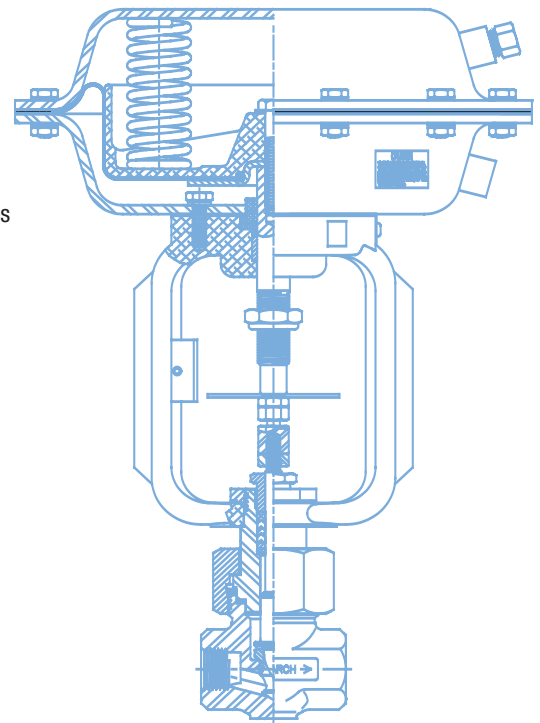
Pressure Rating psig [barg]	High Pressure Model Numbers			
	1/4"	1/2"	3/4"	1"
60,000 [4,138]	2500 Angle Valve			
30,000 [2069]	2030 Angle Valve			
15,000 [1034]	LDV-Low Dead Volume Angle Valve			
	3400 Angle Valve	3517 Angle Valve		
10,000 [690]	2945 Angle Valve			
	5080 Globe Valve			
7,500 [517]			1711HD Barstock Angle or Globe Valve	
			1711Globe Cast	
5,000 [345]	See Type 807		1711Globe Cast	

## Type 1711 High Pressure Control Valves Standard Features

- Interchangeable innervalves
- Choice of linear, equal percent and quick opening innervalves
- TFE chevron packing
- ANSI Class IV shutoff
- High Pressure/temperature rating
- Encapsulated graphite body gasket
- Polyurethane enamel coated pressure cases inside and out
- Adjustable spring preload and up travel stop
- Dual IEC 534 (NAMUR) accessory mounts

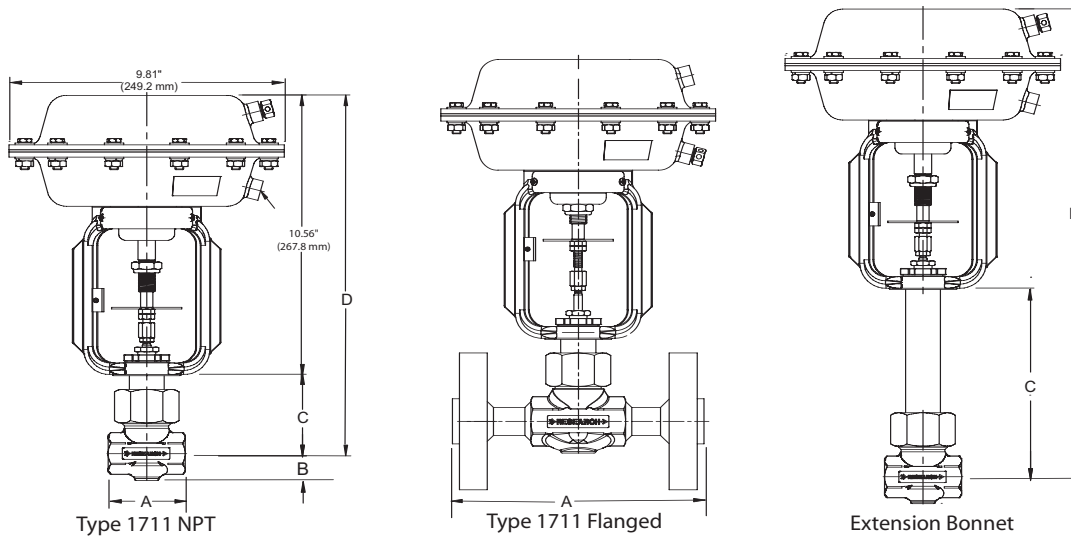
## Optional Features

- Graphite and other special packings
- Extended and other special bonnets
- Socket-weld or butt-weld ends
- Flanges





## Dimensions



## End Connections

Type 1711	NPT	Class 150 RF	Class 300 RF	Class 600 RF	Class 900/1500 RF	Class 2500 RF	All Cast Bodies	Standard Bonnet	Extension Bonnet	Standard Bonnet	Extension Bonnet
BODY SIZE	"A"	"A"	"A"	"A"	"A"	"A"	"B"	"C"	"C"	"D"	"D"
1/2"	2.75 in.	4.25 in.	6.00 in.	6.50 in.	6.50 in.	6.50 in.	1.00 in.	2.91 in.	14.00 in.	13.38 in.	24.47 in.
1/2"	69.85 mm	107.95 mm	152.40 mm	165.10 mm	165.10 mm	165.10 mm	25.40 mm	73.91 mm	355.60 mm	339.85 mm	621.54 mm
3/4"	3.37 in.	7.25 in.	7.62 in.	8.12 in.	8.12 in.	8.12 in.	1.18 in.	3.09 in.	14.00 in.	13.56 in.	24.47 in.
3/4"	85.60 mm	184.15 mm	193.55 mm	206.25 mm	206.25 mm	206.25 mm	29.97 mm	78.49 mm	355.60 mm	344.42 mm	621.54 mm
1"	4.00 in.	7.25 in.	7.75 in.	8.25 in.	8.25 in.	8.25 in.	1.50 in.	3.72 in.	14.00 in.	14.19 in.	24.47 in.
1"	101.60 mm	184.15 mm	196.85 mm	209.55 mm	209.55 mm	209.55 mm	38.10 mm	94.49 mm	355.60 mm	360.43 mm	621.54 mm

## Trim Chart

Valve Size	Trim	Cv	Maximum Rangeability		Port Dia.	Orifice Area (Sq. In)	Maximum Shut-off*	
			Linear	=%			1/2" (psig)	3/4", 1" (psig)
1"	6.0	6.0	50:1	60:1	0.625"	0.307		1,700
1"	5.0	5.0	50:1	60:1	0.625"	0.307		1,700
1"	4.5	4.5	50:1	60:1	0.500"	0.197		2,650
3/4"-1"	4.0	4.0	50:1	60:1	0.500"	0.197		2,650
3/4"-1"	3.5	3.5	50:1	60:1	0.500"	0.197		2,650
1/2"-1"	A	2.5	50:1	50:1	0.375"	0.1105	4,700	4,700
1/2"-1"	B	2.0	40:1	50:1	0.375"	0.1105	4,700	4,700
1/2"-1"	C	1.25	40:1	50:1	0.281"	0.0621	7,500*	5,000*
1/2"-1"	D	0.8	40:1	50:1	0.250"	0.0491	7,500*	5,000*
1/2"-1"	E	0.5	40:1	50:1	0.250"	0.0491	7,500*	5,000*
1/2"-1"	F	0.32	30:1	40:1	0.156"	0.0191	7,500*	5,000*
1/2"-1"	G	0.2	30:1	40:1	0.156"	0.0191	7,500*	5,000*
1/2"-1"	H	0.13	30:1	40:1	0.156"	0.0191	7,500*	5,000*
1/2"-1"	I	0.08	30:1	40:1	0.156"	0.0191	7,500*	5,000*
1/2"-1"	J	0.05	30:1	40:1	0.156"	0.0191	7,500*	5,000*

\*Maximum allowable shut-off is determined by the maximum force that can be preloaded using six springs loaded to 525 lbs force. Although the unit will close the valve, this is no guarantee that the metal will not erode. Life of the innervalue is related to the fluid, temperature, nature of the media and the pressure.

## Pressure vs. Temperature

Type 1711 Temperature F (C)	1/2" NPT PSIG (BAR/G)	3/4" & 1" NPT PSIG (BAR/G)
75 [23.9]	7500 [180.7]	5000 [120.5]
100 [37.8]	7475 [180.1]	4980 [120.0]
200 [93.3]	6625 [159.6]	4415 [106.4]
300 [148.9]	6000 [144.6]	4000 [96.4]
400 [204.4]	5375 [129.5]	3580 [86.3]
500 [260.0]	5075 [122.3]	3380 [81.4]
600 [315.6]	4825 [116.3]	3215 [77.5]
700 [371.1]	4600 [110.8]	3065 [73.9]
800 [426.7]	4525 [109.0]	3015 [72.7]
850 [454.4]	4560 [109.9]	2965 [71.4]



# Sanitary Control Valves

## Applications

The type SCV85 and SCV89 sanitary control valves are well suited to automated control systems found in biotechnology, pharmaceutical and food processes. Common uses are pressure, temperature and flow control in fermentation reactors; control of gas blankets in closed vessels; and catalyst, defoamer, and additive initiation.



*SCV89 Sanitary Control Valve*



*SCV85 Sanitary Control Valve*

## SCV89 vs. SCV85

The SCV85 is designed to the highest quality standards demanded by the biotechnology and pharmaceutical industries. Machined out of traceable barstock and highly polished, these valves are used where a high level of cleanliness is required.

The SCV-89, while having the same flow performance as the SCV85, is an economical sanitary control solution. Utilizing a cast body, this valve is designed to meet the needs of the food, dairy and cosmetic industries.

## Description

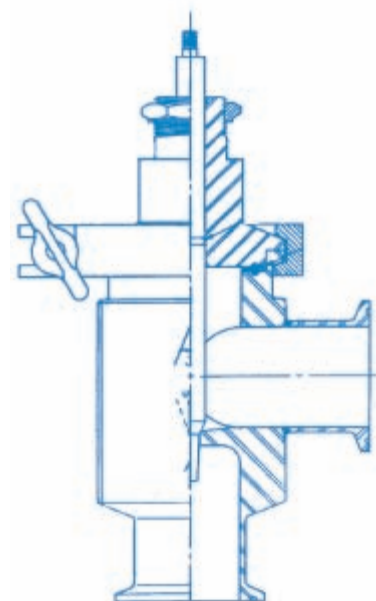
Both the SCV85 and SCV89 RESEARCH CONTROL Valves are compact, modulating valves designed to meet the manufacturing standards established by the 3A Symbol Council. They are available in five sizes: 1/2", 3/4", 1", 1-1/2" and 2". Several innervalves are available in each size to cover medium and low flow rates.

## Standard Features

- Manufactured in accordance with the 3A Symbol Council
- O-ring stem seal quick disassembly with clamps
- Choice of ends: butt-weld, Tri-Clamp
- Choice of 17 innervalves
- Choice of innervalve characteristics: linear, equal percentage, quick-open

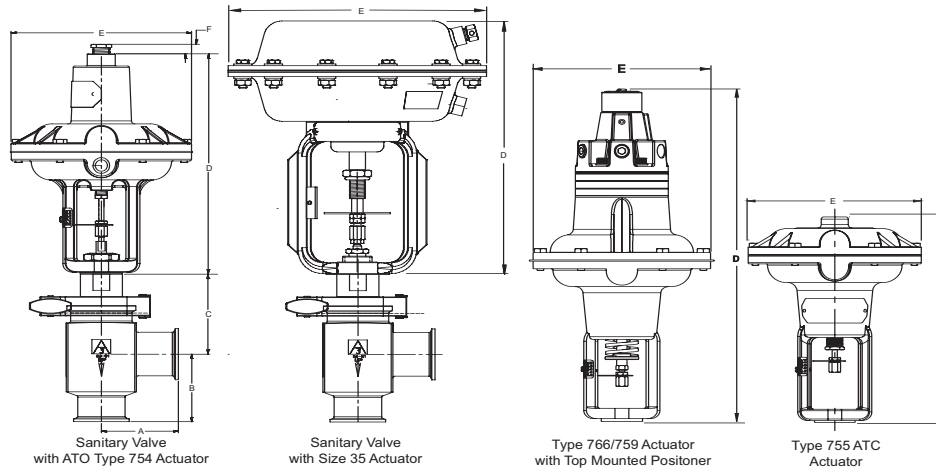
## Optional Features

- Stainless steel actuators





## Dimensions



BODY SIZE	<div style="display: flex; justify-content: space-around; text-align: center;"> <span>754 ATO</span> <span>755 ATC</span> <span>766 w/BLRA</span> <span>759 w/TLDA</span> <span>Research Actuators</span> <span>754 ATO (Max)</span> <span>Size 35 Actuator</span> <span>Size 35 Actuator</span> </div>											
	"A"	"B"	"C"	"D"	"D"	"D"	"D"	"E"	"F"	"D"	"E"	
1/2"	1.56 in.	1.56 in.	2.75 in.	8.55 in.	8.3 in.	13.93 in.	13.98 in.	6.43 in.	0.37 in.	NA	NA	
1/2"	[39.62 mm]	[39.62 mm]	[69.85 mm]	[217.17 mm]	[210.82 mm]	[353.82 mm]	[355.09 mm]	[163.32 mm]	[9.40 mm]	NA	NA	
3/4"	1.56 in.	1.69 in.	2.62 in.	8.55 in.	8.3 in.	13.93 in.	13.98 in.	6.43 in.	0.37 in.	NA	NA	
3/4"	[39.62 mm]	[42.93 mm]	[66.55 mm]	[217.17 mm]	[210.82 mm]	[353.82 mm]	[355.09 mm]	[163.32 mm]	[9.40 mm]	NA	NA	
1"	2.75 in.	2.62	3.60	NA	NA	NA	NA	NA	NA	10.56	9.81	
1"	[69.85 mm]	[66.55 mm]	[79.25 mm]	[217.17 mm]	[210.82 mm]	[353.82 mm]	[355.09 mm]	[163.32 mm]	[9.40 mm]	[268.22 mm]	[249.17 mm]	
1-1/2"	2.75 in.	2.87 in.	2.87 in.	8.55 in.	8.3 in.	13.93 in.	13.98 in.	6.43 in.	0.37 in.	10.56 in.	9.81 in.	
1-1/2"	[69.85 mm]	[72.90 mm]	[72.90 mm]	[217.17 mm]	[210.82 mm]	[353.82 mm]	[355.09 mm]	[163.32 mm]	[9.40 mm]	[268.22 mm]	[249.17 mm]	
2"	2.62 in.	2.62 in.	3.6 in.	NA	NA	NA	NA	NA	NA	10.56 in.	9.81 in.	
2"	[66.55 mm]	[66.55 mm]	[91.44 mm]	NA	NA	NA	NA	NA	NA	[268.22 mm]	[249.17 mm]	

## Trim Chart

SIZE	TRIM	MAX CV	Orifice Dia. (in.)	Orifice Area (in <sup>2</sup> )	Actuator
2"	60	60	1.891	2.808	Size 35
2"	40	40	1.891	2.808	Size 35
2"	20	20	1.000	0.785	Size 35
2"	15	15	1.000	0.785	Size 35
1-1/2"	20	20	1.000	0.785	Size 35 or RCV
1-1/2"	15	15	1.000	0.785	Size 35 or RCV
1-1/2"	10	10	0.750	0.442	Size 35 or RCV
1-1/2"	8	8	0.750	0.442	Size 35 or RCV
1-1/2"	6	6	0.750	0.442	Size 35 or RCV
1"	10	10	0.750	0.442	Size 35 or RCV
1"	8	8	0.750	0.442	Size 35 or RCV
1"	6	6	0.750	0.442	Size 35 or RCV
1"	5	5	0.500	0.196	Size 35 or RCV
1"	4	4	0.500	0.196	Size 35 or RCV
1"	A	3	0.500	0.196	Size 35 or RCV
3/4"	5	5	0.500	0.196	RCV
3/4"	4	4	0.500	0.196	RCV
3/4"	A	3	0.500	0.196	RCV
3/4"	B	2	0.375	0.110	RCV
3/4"	C	1.25	0.375	0.110	RCV
3/4"	D	0.8	0.375	0.110	RCV
1/2"	B	2	0.375	0.110	RCV
1/2"	C	1.25	0.375	0.110	RCV
1/2"	D	0.8	0.375	0.110	RCV
1/2"	E	0.5	0.156	0.019	RCV
1/2"	F	0.32	0.156	0.019	RCV
1/2"	G	0.2	0.156	0.019	RCV
1/2"	H	0.13	0.156	0.019	RCV
1/2"	I	0.08	0.156	0.019	RCV
1/2"	J	0.05	0.156	0.019	RCV

## Pressure/Temperature

- 300 psig (20 barg) @ 75F(24C)
- 150 psig (10 barg) @ 300F (149C)



## Model 9000 & Model 9100 Control Valves

### Applications

The Model 9000 and 9100 are designed for modulating control of liquids, gases and steam in industrial applications where performance, quality and compact physical size are important. These rugged designs offer features and performance levels normally found in more expensive, larger valves.

The unit is designed to handle fluids and environments found in chemical plants, pulp & paper and textile mills, refineries and many other demanding industries.



Model 9100



Model 9000

### MODEL 9000

#### Standard Features

- 316 stainless steel construction
- Dual body mounting [NPT/Flangeless]
- Wide range of innervalves
- Linear, Equal Percent or On-Off
- ANSI Class IV seat leak standard
- Encapsulated body gasket
- No brass or asbestos
- Epoxy coated steel parts
- Multi-Spring reversible diaphragm actuator
- Adjustable spring loading

#### Optional Features

- Stellite® Innervalue
- Soft seating innervalue
- Seat leakage Class 5 or 6
- Alloy C body material
- 3-Way design
- Double packing
- Double packing with Purge Port
- Bellows seal bonnets
- Extended bonnets for hot or cryogenic service
- Positioners, i/p converters, filter regulators
- Limit switches, solenoid valves, gauges

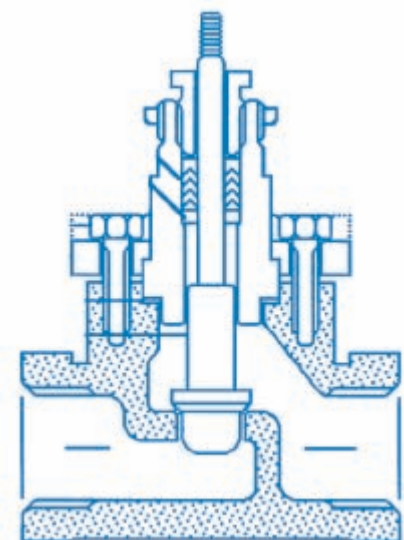
### MODEL 9100

#### Standard Features

- Heavy Duty Hi-Capacity bronze body
- Large choice of innervalue sizes
- Choice of linear, equal percent and quick opening innervalves
- ANSI Class IV Shut-Off
- Live-Loaded TFE Packing
- Heavy Duty Post Guided Innervalue
- Multi-Spring reversible diaphragm actuator
- Adjustable spring loading

#### Optional Features

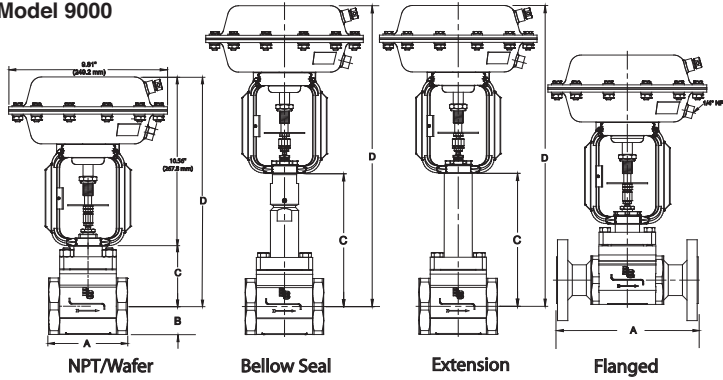
- Linear Characteristic or Quick Open On-Off
- Double Packing, Reduced Emissions Kalrez (REK) fugitive emission packing
- Alarm/Purge port with double packing
- SST bonnet extensions for cryogenic service
- Positioners, Limit switches, Airset, etc.
- Carbon steel "Lap-Joint Flange Kit," for conversion to CL150 Flanges [meets ASME/ANSI face-to-face length]



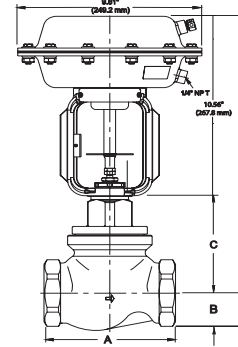


**Dimensions**

**Model 9000**



**Model 9100**



**End Connections**

**Bonnet**

Model 9000	NPT Water	Class 150 RF	Class 300 RF	All	Standard	Standard	Bellow Seal	Bellow Seal	Extension	Extension
BODY SIZE	"A"	"A"	"A"	"B"	"C"	"D"	"C"	"D"	"C"	"D"
1"	4.00 in.	7.25 in.	7.75 in.	1.00 in.	3.20 in.	13.68 in.	7.90 in.	18.37 in.	10.00 in.	20.50 in.
1"	101.60 mm	184.15 mm	196.85 mm	25.40 mm	81.28 mm	347.47 mm	200.66 mm	466.60 mm	254.00 mm	520.70 mm
1-1/2"	4.50 in.	8.75 in.	9.25 in.	1.50 in.	3.46 in.	13.94 in.	8.10 in.	18.57 in.	10.00 in.	20.50 in.
1-1/2"	114.30 mm	222.25 mm	234.95 mm	38.10 mm	87.88 mm	354.08 mm	205.74 mm	471.68 mm	254.00 mm	520.70 mm
2"	4.85 in.	10.00 in.	10.50 in.	1.50 in.	3.59 in.	14.07 in.	8.30 in.	18.77 in.	10.00 in.	20.50 in.
2"	123.19 mm	254.00 mm	266.70 mm	38.10 mm	91.19 mm	357.38 mm	210.82 mm	476.76 mm	254.00 mm	520.70 mm

**Model 9100**

BODY SIZE	"A"	"B"	"C"	"D"
1/2"	4.50 in.	4.44 in.	10.50 in.	14.94 in.
1/2"	114.30 mm	112.78 mm	266.70 mm	379.48 mm
3/4"	4.50 in.	4.44 in.	10.50 in.	14.94 in.
3/4"	114.30 mm	112.78 mm	266.70 mm	379.48 mm
1"	4.50 in.	4.44 in.	10.50 in.	14.94 in.
1"	114.30 mm	112.78 mm	266.70 mm	379.48 mm
1-1/4"	6.25 in.	5.22 in.	10.50 in.	15.72 in.
1-1/4"	158.75 mm	132.59 mm	266.70 mm	399.29 mm
1-1/2"	6.25 in.	5.22 in.	10.50 in.	15.72 in.
1-1/2"	158.75 mm	132.59 mm	266.70 mm	399.29 mm
2"	7.00 in.	5.62 in.	10.50 in.	16.12 in.
2"	177.80 mm	142.75 mm	266.70 mm	409.45 mm

**Pressure vs. Temperature**

Model 9000					Model 9100			
Temperature F [C]	NPT/Wafer 316SS PSIG [BAR(G)]	Class 150 RF PSIG [BAR(G)]	Class 300 RF PSIG [BAR(G)]	Bellow Seal PSIG [BAR(G)]	Temperature F	Temperature [C]	Pressure PSIG	Pressure [BAR(G)]
100F [37.8]	720 [49.7]	275 [19.0]	720 [49.7]	720 [49.7]	-20	[-28.9]	300	[20.7]
200F [93.3]	620 [42.8]	240 [16.6]	620 [42.8]	620 [42.8]	150	[65.6]	300	[20.7]
300F [148.9]	560 [38.6]	215 [14.8]	560 [38.6]	560 [38.6]	200	[93.3]	270	[18.6]
400F [204.4]	515 [35.5]	195 [13.4]	515 [35.5]	515 [35.5]	250	[121.1]	240	[16.6]
500F [260.0]	480 [33.1]	170 [11.7]	480 [33.1]	480 [33.1]	300	[148.9]	210	[14.5]
600F [315.6]	450 [31.0]	140 [9.7]	450 [31.0]	450 [31.0]	350	[176.7]	180	[12.4]
700F [371.1]	430 [29.7]	110 [7.6]	430 [29.7]	430 [29.7]	406	[207.8]	150	[10.3]
800F [426.7]	415 [28.6]	80 [5.5]	415 [28.6]	415 [28.6]				
900F [482.2]	395 [27.2]	50 [3.4]	395 [27.2]	395 [27.2]				
1000F [537.8]	365 [25.2]	20 [1.4]	365 [25.2]	365 [25.2]				

**Pressure vs. Temperature**

**Model 9000**

Valve Size	Orifice Dia. (in.)	Orifice Area (in2)	FL	Seat Type	Cv Linear	Cv Equal %
2"	1.5	1.77	0.85	integral	25	20
2"	1.125	1	0.86	replaceable	21	17
2"	0.812	0.52	0.88	replaceable	15	14
2"	0.625	0.31	0.9	replaceable	7	6.5
1-1/2"	1.25	1.23	0.85	integral	15.5	13
1-1/2"	0.812	0.52	0.87	replaceable	11	10
1-1/2"	0.625	0.31	0.9	replaceable	7	6.5
1-1/2"	0.625	0.31	0.92	replaceable	4	4
1"	0.812	0.52	0.85	integral	8.3	7
1"	0.5	0.2	0.87	replaceable	5.3	4.5
1"	0.5	0.2	0.89	replaceable	2	2
1"	0.5	0.2	0.91	replaceable	1	1
1"	0.156	0.02	0.93	replaceable	0.5	0.5
1"	0.156	0.02	0.94	replaceable	0.2	0.2
1"	0.156	0.02	0.95	replaceable	0.1	0.1
1"	0.156	0.02	0.96	replaceable	0.05	0.05
1"	0.156	0.02	0.97	replaceable	0.02	N/A

**Model 9100**

Valve Size	Valve Cv's	Orifice Dia. (in.)	Orifice Area (in2)	Lift (in.)
2"	54	2	3.14	1"
2"	36	1.75	2.41	1"
2"	22	1.75	2.41	1"
1-1/2"	35	1.63	2.07	1"
1-1/2"	24	1.25	1.23	1"
1-1/2"	15	1.25	1.23	1"
1-1/4"	29	1.63	2.07	1"
1-1/4"	20	1.25	1.23	1"
1-1/4"	12	1.63	2.07	1"
1"	15	1	0.79	3/4"
1"	10	0.75	0.44	3/4"
1"	6	0.75	0.44	3/4"
1"	3	0.5	0.20	3/4"
3/4"	12	0.75	0.44	3/4"
3/4"	8	0.75	0.44	3/4"
3/4"	6	0.75	0.44	3/4"
3/4"	3	0.5	0.20	3/4"
1/2"	6	0.75	0.44	3/4"
1/2"	3	0.5	0.20	3/4"



# Accessories

Industrial

Petrochemical

Cryogenics

Sanitary/  
Pharmaceutical

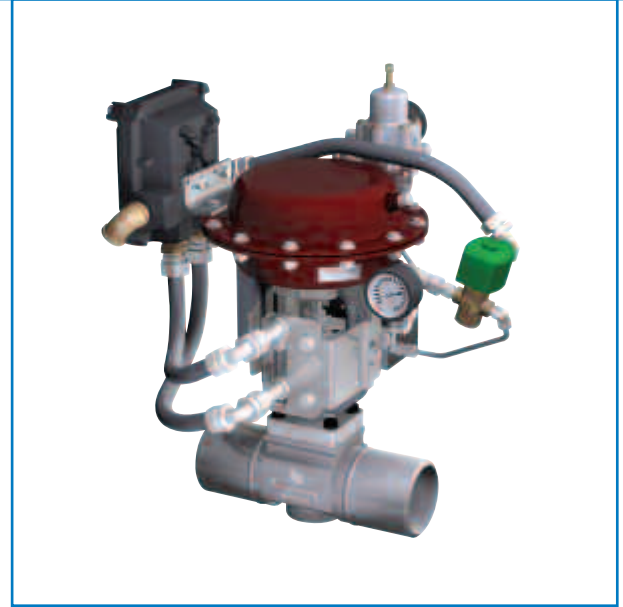
Water Treatment/  
Chemical Additive

Specialty

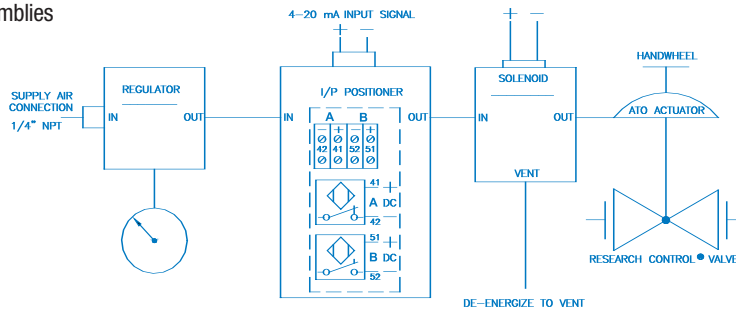
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