

A **Control Valve** is one component of a control loop and relies upon other components for proper function of operation (i.e. controller, sensor, transducer, etc.).

Control Valves with PNEUMATIC Actuator



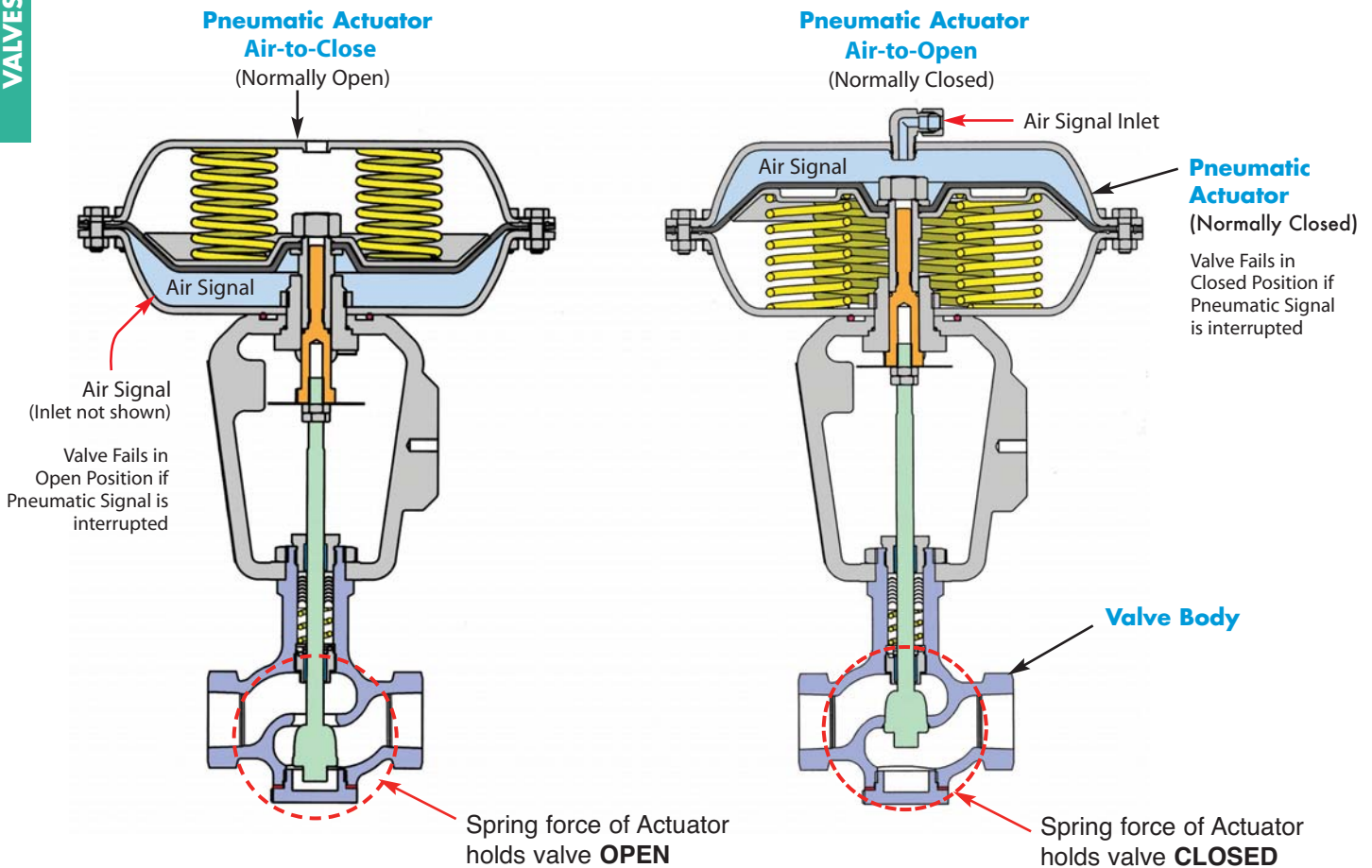
HB-Series 2-Way Valve
shown with
Air Filter & Positioner

For **HEATING** applications, a **Normally-Closed/Air-to-Open (ATO)** Valve should be selected. If the Pneumatic Signal to the actuator is interrupted, the valve will automatically fail in the closed position to prevent overheating.

For **COOLING** applications, a **Normally-Open/Air-to-Close (ATC)** Valve should be selected. If the signal to the actuator is interrupted, the valve will automatically fail in the open position to prevent overheating.

The **Max Close-Off Pressure (PSI Δ P)** of the valve must exceed the inlet pressure to the valve or the valve will not operate. See Max (PSI Δ P) Chart. In applications where the Maximum Close-Off Pressure of the valve is insufficient, a **Valve Positioner** can be utilized to increase the close-off pressure capability of the valve.

Selecting the correct size valves requires using the capacity charts or specialized sizing software which can be made available by the factory. Proper sizing of the control valve is an important aspect of the selection process. Be careful to not oversize the valve. See Engineering Section for more detailed information on valve selection.



2-Way Valves with PNEUMATIC ACTUATORS

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The **HB Series** Stainless Steel 2-Way Control Valves are made to withstand the rigorous nature of **steam and water service** and are compatible with most other fluids as well. The standard configuration has an equal percentage flow characteristic with metal-to-metal seating, spring-loaded Teflon V-ring stem packing.

The Pneumatic Actuator is controlled by a 3-15 PSIG standard instrument air signal that will modulate the position of the valve. The Actuator can be specified to operate the valve for either **Air-To-Open (Normally Closed)**, typical for **HEATING** applications) or **Air-To-Close (Normally Open)**, typical for **COOLING** applications). Fail-safe Mode can also be re-configured in the field if needed.



2-Way Valves with Pneumatic Actuator
1/2" - 4" • Threaded & Flanged

3-Way Valves with PNEUMATIC ACTUATORS

Pages 324-327

The **HB Series** Stainless Steel 3-Way Control Valves are used for **mixing** two liquid streams, or for **diverting** the flow of a single liquid stream into two streams (bypass).

The disc type design is constructed of Stainless Steel for extended service life.

Teflon seat rings are available for increased shut-off tightness or for water or glycol type service, up to a maximum of 450°F.



CONTROL VALVES

3-Way Valves with Pneumatic Actuator
1/2" - 4" • Threaded & Flanged

Valve Positioner – Pneumatic or Electro-Pneumatic

Pages 328-331

Valve positioners improve control accuracy and increase maximum close-off pressure capability of the valve. The Positioner is mounted to the valve's yoke assembly and linked to the valve stem. It receives a transduced air signal or direct electrical signal from the electronic controller and compares the control signal to the actual position of the valve plug. The Positioner then sends a corrected air signal to the valve's actuator, thereby positioning the valve plug for optimum flow modulation. Available options include **Intrinsically Safe**, **Explosion-Proof** and **Digital** designs.



Capacity Charts

Page 338-340

Orifice Plates- Sound Attenuation

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Control Loop Explanation

Pages 342-343

TR890 Series Electronic PID Controllers

Pages 344-349



The TR890 Series Electronic PID Controller is the user-interface which allows adjustment of the set point and controls the electrical signals received from the sensor and outputted to the I/P Transducer or directly to an Electro-Pneumatic Valve Positioner or Electric Actuator. The TR893 is the most common controller model due to its larger, more user-friendly size.

The NANOADAC Series is a PID Controller with added features such as data recording and Modbus Communications (BACnet is optional).

I/P Transducer, Air Filter/Regulator & Electronic Temperature Sensors

Page 350-352

**TA901 Electro-Pneumatic (I/P) Transducer**

The TA901 is an electro-pneumatic transducer that converts an electrical signal (4-20 mA) from the Controller to an air signal (3-15 PSIG) for supply to the control valve Actuator or valve Positioner.

**TA987 Air Filter & Regulator**

The TA987 is recommended for filtering and regulating the pressure of plant compressed air, and for delivering clean, dry air at the proper pressure to pneumatic control devices. The filtering element removes particles as small as 5 microns.

**TDD & TMD - 100 Ω & 1000 Ω RTDs****TJD & TKD - Type J & Type K Thermocouples**

Both RTD (Resistance Temperature Device) and Thermocouple sensors are available options. These devices sense the temperature of the fluid or product being heated or cooled and transmit an electrical signal to the PID controller.

76 Series Thermowells for RTD & Thermocouple Temperature Sensors

Page 353



Thermowells are used for applications where the process media may be corrosive or contained under pressure – to prevent damage to the sensor and to facilitate removal of the sensor from the process. To prevent leakage of the process fluid, spring-loaded sensors must always be installed in a thermowell.

2-Way Valve with Pneumatic Actuator

for **HEATING** • **COOLING** • **FLUID TRANSFER** • **Steam, Air, & Water**

2-Way • 1/2" – 4"

Valve Design conforms to ANSI/ASME B 16.34

Models	HB 2-Way Valve with Pneumatic Actuator
Service	Steam, Air, Water
Sizes	1/2" - 4"
Connections	NPT, 150# FLG, 300# FLG
Body Material	316 Stainless Steel
Plug and Seat Material	Stainless Steel (Std.)
PMO Max. Operating Pressure	720 PSIG @ 100°F
TMO Max. Operating Temperature	450°F @ 497 PSIG
Min Operating Temperature	-20°F
Max Air Supply Pressure	50 PSIG
Max Ambient Temperature	280°F
Min Ambient Temperature	-20°F



DESIGN PRESSURE/TEMPERATURE RATING – PMA/TMA

NPT	497 PSIG @ 450°F
150# FLG	182 PSIG @ 450°F
300# FLG	497 PSIG @ 450°F

The HB Series Stainless Steel 2-Way Control Valves are made to withstand the rigorous nature of steam service and are compatible with air, water, and other fluids as well. These stainless steel valves are a cost-effective alternative when compared to valves with bronze, cast iron or cast steel bodies. The standard configuration has an equal percentage flow characteristic with metal-to-metal seating, spring-loaded Teflon V-ring stem packing and Pneumatic Actuator. The Pneumatic Actuator is controlled by a 3-15 PSIG standard instrument air signal that will modulate the position of the valve.

The Actuator can be specified to operate the valve for either **Air-to-Open (Normally Closed)**, typically for **“HEATING”** applications) or **Air-to-Close (Normally Open)**, typically for **“COOLING”** applications), but can also be re-configured in the field if needed.

TECHNICAL INFORMATION

Plug Design	Equal Percentage
	Linear
	Soft-Seat
Leakage Rating	ANSI/FCI-70-2 Class IV, VI
Rangeability	50:1
Travel (1/2" - 2" Body)	3/4"
(2 1/2" - 4" Body)	1 1/8"
Body Design Rating	ASME 150/300
Diaphragm Design	Semi-rolling, Multi-spring
Action Options	Fail Open
	Fail Closed
	Field Reversible
Positioner Mounting	IEC 60534-6-1 (NAMUR)

CONTROL VALVES

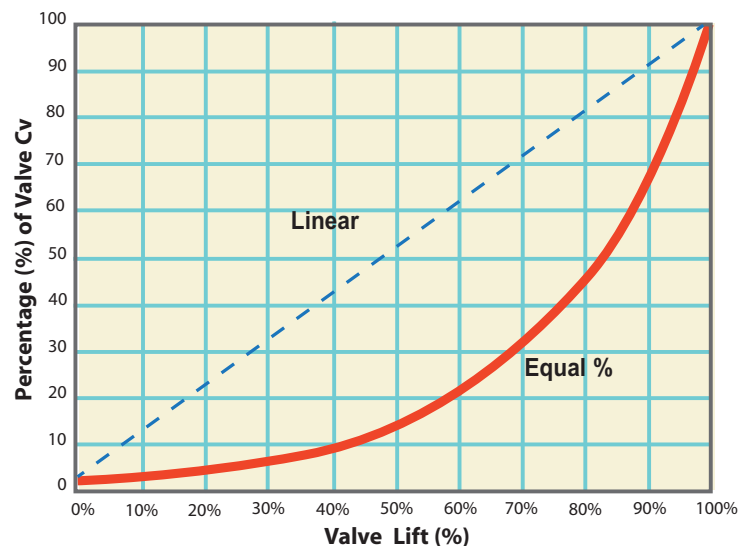
Description & Operation

A control valve is a device capable of modulating flow at varying degrees between minimal flow and full capacity in response to a signal from an external control device. The valve modulates flow through movement of a valve plug in relation to the port(s) located within the valve body. The valve plug is attached to a valve stem, which, in turn, is connected to the actuator. The actuator, which can be pneumatically or electrically operated, directs the movement of the stem as dictated by the external control device.

Options & Associated Control Loop Accessories

- Positioner: Pneumatic, Electro-Pneumatic or Explosion-Proof
- PID Electronic Controllers (TR890 Series)
- I/P converters (Model TA901)
- Air Filter Regulators (Air Sets-Model TA987)
- Thermocouples
- RTD's
- Pressure Transmitters

Flow Characteristic Curve



HB Control Valves

2-Way Valve with Pneumatic Actuator

PNEUMATIC ACTUATORS

2-Way • 1/2" – 4"

I/P = Close-Off Pressures using I/P Transducer Only
 w/Pos. = Close-Off Pressures with Positioner

Size	Connection	Partial Valve Model Code†		Actuator in ²	Max Close-Off Pressure (PSI ΔP)						
					Air-to-Open (Fail Close)				Air-to-Close (Fail Open)		
		Standard Actuator Range (PSIG)			Optional Actuator Range (PSIG)		Standard Actuator Range (PSIG)				
		Full Port	Cv		3-15 PSIG Signal 8-15 PSIG Bench	3-15 PSIG Signal 5-15 PSIG Bench	3-21 PSIG Signal 12-21 PSIG Bench	3-15 PSIG Signal 13-23 PSIG Bench	3-15 PSIG Signal 3-8 PSIG Bench		
		I/P	w/Pos.	I/P	with Positioner	I/P	w/Pos.				
1/2"	NPT	HB1000F-12N	5	50	315	515	145	720	-	430	720
3/4"	NPT	HB1000F-13N	6.5		315	515	145	720	-	430	720
1"	NPT	HB1000F-14N	10		315	515	145	720	-	430	720
1 1/2"	NPT	HB1000F-16N	22		170	270	75	430	-	220	665
2"	NPT	HB1000F-17N	42		85	140	40	225	-	115	350
1/2"	150# FLG	HB1000F-121	5	50	275*	275*	145	275*	-	275*	275*
3/4"	150# FLG	HB1000F-131	6.5		275*	275*	145	275*	-	275*	275*
1"	150# FLG	HB1000F-141	10		275*	275*	145	275*	-	275*	275*
1 1/2"	150# FLG	HB1000F-161	22		170	270	75	275*	-	220	275*
2"	150# FLG	HB1000F-171	42		85	120	40	225	-	115	275*
2 1/2"	150# FLG	HB1000F-181	70	100	85	60	15	100	-	50	160
2 1/2"	150# FLG	HB1000F-181	70		100	160	-	-	245	140	435
3"	150# FLG	HB1000F-191	110		75	120	-	-	185	106	331
4"	150# FLG	HB1000F-201	170		40	65	-	-	100	56	180
1/2"	300# FLG	HB1000F-123	5	50	315	515	145	720	-	430	720
3/4"	300# FLG	HB1000F-133	6.5		315	515	145	720	-	430	720
1"	300# FLG	HB1000F-143	10		315	515	145	720	-	430	720
1 1/2"	300# FLG	HB1000F-163	22		170	270	75	430	-	220	665
2"	300# FLG	HB1000F-173	42		85	140	40	225	-	115	350
2 1/2"	300# FLG	HB1000F-183	70	100	100	160	-	-	245	140	435
3"	300# FLG	HB1000F-193	110		75	120	-	-	185	106	331
4"	300# FLG	HB1000F-203	170		40	65	-	-	100	56	180

* Shut-off pressure limited by flange class rating.

Special High Thrust Actuator available for increased shut-off pressures on 2 1/2" - 4" valve bodies; Consult factory.

CONTROL VALVES

† To complete Full Model Code, Must Specify: Trim, Packing, Actuator and Control Signal Type

Example (Air-to-Open): HB1000F-12N-PA1-00
 Example (Air-to-Close): HB1000F-12N-PA2-00

Model Code Configuration Chart

2-Way VALVE BODY								CONNECTION				ACTUATOR - 50 in ² (PSIG)												
Model	Code	Trim Style	Code	Seat Type	Code	Packing	Code	Port Type	Code	Size	Code	Connection	Code	Actuator	Code	Control Signal	Bench Set							
HB1	0	Equal Percentage	0	Metal Seat	0	Teflon Graphite	F	Full Port	12	1/2"	N	NPT	PA1	Air-to-Open- (Fail-Closed)	00	3-15	8-15							
				Stainless														1	3-15	5-15				
	1	Linear	1	Soft Seat	1	Teflon Graphite	R	Reduced	14	1"	3	300# FLG	PA2	Air-to-Close- (Fail-Open)	00	3-15	3-8							
				Teflon														16	1 1/2"	6	600# FLG	00	3-15	12-21
				Elastomers														17	2"	B	BSP			
				C.F. EPDM														18	2 1/2"	P	PN16			
				C.F. Viton														19	3"	Q	PN25			
																		20	4"					

Options	Code
Other Elastomer Trim	C.F.
Positioner Mounting Kit:	W-KIT-NP-HB-ATO/ATC
Direct Mount I/P Transducer	TA901
Direct Mount Air Filter/Regulator	TA987
Air Filter/Regulator Mounting Kit:	W-KIT-TA987-HB (50in ² act.) W-KIT-TA987-HB-L (100in ² act.)
Stainless Steel 50 in ² Actuator	C.F.
Solenoid valve for pneumatic On/Off operation.	C.F.
Handwheel for Actuator	C.F.

ACTUATOR - 100 in ²			
PB1	Air-to-Open- (Fail-Closed)	00	3-15 8-15
		11	3-23 13-23
PB2	Air-to-Close- (Fail-Open)	00	3-15 3-8

2-Way Valve with Pneumatic Actuator

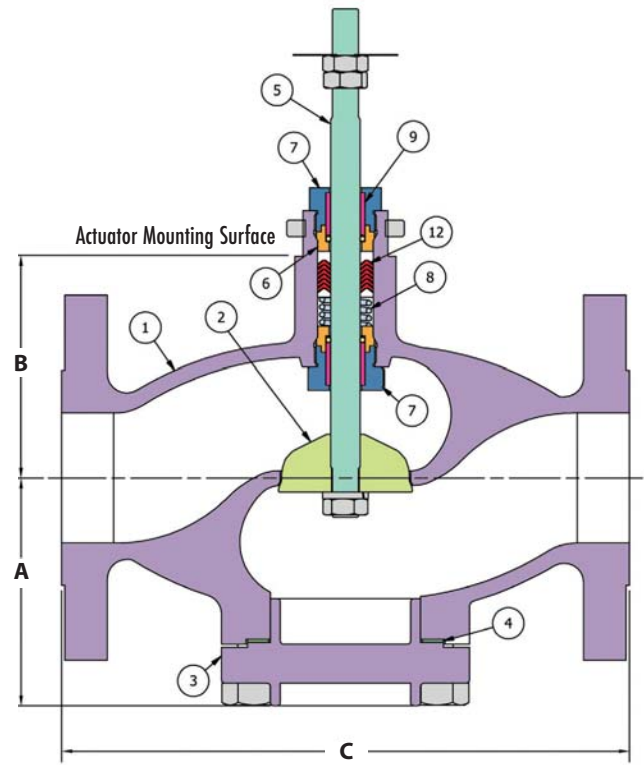
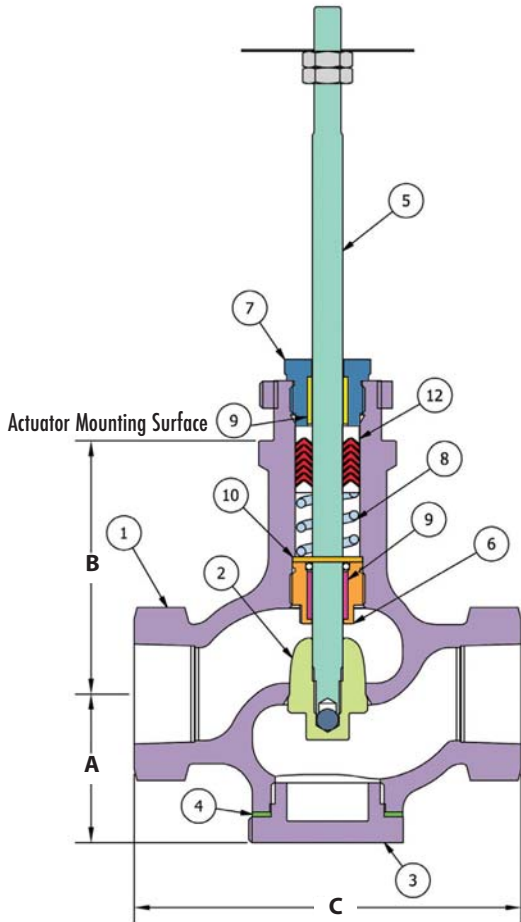
for HEATING • COOLING • FLUID TRANSFER • Steam, Air, & Water

2-Way • 1/2" – 4"

1/2" to 2"
Threaded & Flanged

2 1/2" to 4"
Flanged

CONTROL VALVES



Item	Description	Material
1	Body	316 Stainless Steel
2	Valve Plug*	Hardened Stainless Steel
3	Body Plug	316 Stainless Steel
4	Body Gasket*	303 Stainless Steel
5	Stem*	316 Stainless Steel
6	Lower Seal Bushing	303 Stainless Steel
7	Gland Nut	303 Stainless Steel
8	Stem Seal Spring*	302 Stainless Steel
9	Guide Bushing*	Rulon 641 / PTFE
10	Washer / Retainer	303 Stainless Steel
12	V-ring Stem Seals*	PTFE

* Recommended Spare Parts

Size	A	B	C			Weight (lbs)		
			NPT	150#	300#	NPT	150#	300#
1/2"	1.76	2.95	4.50	7.25	7.75	3.5	6	7
3/4"	1.76	2.95	4.50	7.25	7.75	3.5	7	9
1"	1.74	2.95	4.50	7.25	7.75	5.5	10	13
1 1/2"	2.15	2.95	5.00	8.75	9.25	6.8	14	19
2"	2.31	2.95	6.00	10	10.5	10	21	25
2 1/2"	4.38	4.25	-	10.88	11.5	-	41	46
3"	5.56	4.25	-	11.75	12.5	-	65	74
4"	6.19	4.25	-	13.88	14.5	-	92	112

MAXIMUM FLOW COEFFICIENT (C_v)

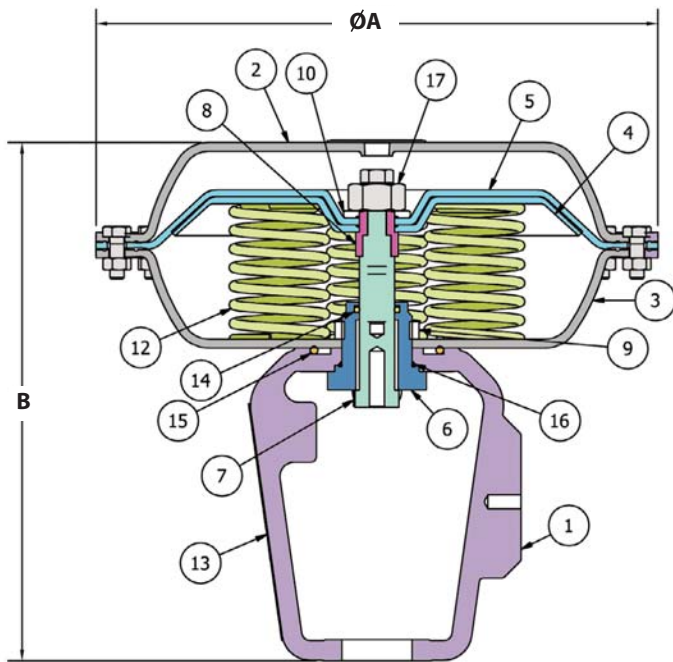
Valve Body Size	1/2" (Reduced Port)	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
	3.5	5	6.5	10	22	42	70	110	170

2-Way Valve with Pneumatic Actuator

for HEATING • COOLING • FLUID TRANSFER • Steam, Air, & Water

2-Way • 1/2" – 4"

Pneumatic Actuator 50in²



Pneumatic Actuator 50 in²

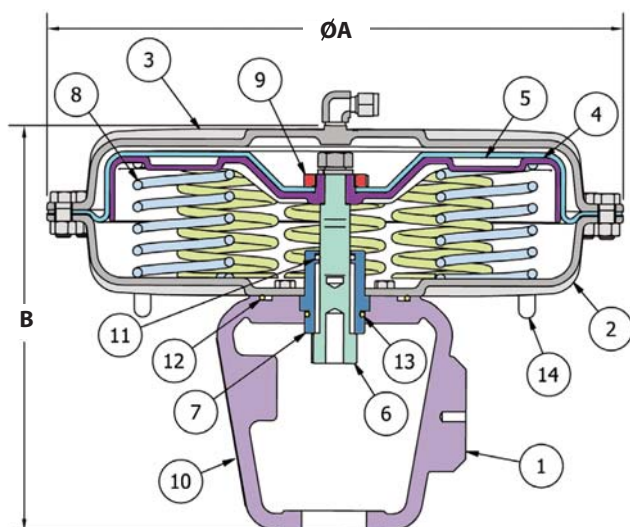
Item	Description	Material
1	Yoke	Stainless steel
2**	Upper diaphragm case	Epoxy painted steel
3**	Lower diaphragm case	Epoxy painted steel
4	Diaphragm plate	Nickel plated steel
5*	Diaphragm	Nylon reinforced Neoprene
6	Upper guide bush	Stainless Steel / Bronze
7	Lower actuator stem	Stainless steel
8	Upper actuator stem	Stainless steel
9	Ring nut	Stainless steel
10	Diaphragm washer	Stainless steel
11	Position indicator disc	Stainless steel
12*	Spring**	Stainless steel
13	Nameplate	Stainless steel
14*	Stem O-ring	Viton
15*	Yoke O-ring	Viton
16*	Upper guide O-ring	Viton
17	Hex nut Stainless	Steel

* Recommended Spare Parts

** Available in Stainless Steel

Optional Actuator Handwheel for manual Adjustment. C.F.

Pneumatic Actuator 100in²



Pneumatic Actuator 100 in²

Item	Description	Material
1	Yoke	Stainless steel
2	Lower diaphragm case	Stainless steel
3	Upper diaphragm case	Stainless steel
4	Diaphragm plate	Stainless steel
5*	Diaphragm	Nylon reinforced Neoprene
6	Spindle	Stainless steel
7	Guide bushing Assembly	Stainless Steel / Bronze
8*	Spring (x8)	Stainless steel
9	Diaphragm nut	Stainless steel
10	Nameplate	Stainless steel
11*	Spindle O-ring	Viton
12*	Yoke O-ring	Viton
13*	Guide O-ring	Viton
14	Thread Protector	Viton

* Recommended Spare Parts

Actuator Size	A	B	Weight (lbs)
50 in ²	10.00	9.25	18
100 in ²	14.38	10.00	50

Special High Thrust Actuator available for increased shut-off pressures on 2 1/2" - 4" valve bodies; Consult factory.

CE100 Series Electro-Pneumatic Positioners

for 2-Way or 3-Way Pneumatically-Actuated Valves

Valve Positioners (Electro-Pneumatic)



The **CE100 Series Electro-Pneumatic Positioners** improve control accuracy and increase maximum close-off pressure capability of the valve. The Positioner is mounted to the valve's yoke assembly and linked to the valve stem. It receives a transduced air signal or direct electrical signal from the electronic controller and compares the control signal to the actual position of the valve plug. The Positioner then sends a corrected air signal to the valve's actuator, thereby positioning the valve plug for optimum flow modulation.

The **Electro-Pneumatic Positioner** receives an electrical 4-20 mA signal directly from the PID Controller and therefore eliminates the need for a separate I/P Transducer.

CONTROL VALVES

	Electro-Pneumatic CE100
Input Signal	4-20 mA
Supply Air Pressure	20 to 100 PSIG
Action	Single-Acting
Air Connection	1/4" NPT (Gauge 1/8" NPT)
Electrical Connection	1/2" NPT
Pressure Gauges	Included
Cam	Linear Characteristics
Ambient Temperature	-4 ° to 185 ° F (-20 ° - 83 ° C)
Enclosure Material	Die Cast Aluminum
Enclosure Rating	IP65 (dust and drip-proof)
Weight	4.8 lbs. (2.2 kg)
Optional Explosion Protection	ATEX: D = Gas Ex d P = Gas/Dust Ex d E = Gas Ex ia
Linear Error	0.7% full span
Hysteresis	0.4% full span
Repeatability	0.3% full span
Media	Oil-free instrument Air Filtered to 5 micron
Flow Capacity	SCFM
@20 PSI	9.5
@87 PSI	28.3
Air Consumption	SCFM
@20 PSI	0.2
@87 PSI	0.6



HB-Series Control Valve
shown with
CE100 Positoner
and **TA987 Air/Filter Regulator**

CE100 Electro-Pneumatic Positioner Options					
Type	Model Code	Features	Weight lbs.	Explosion Protection Options	
				Suffix Code	Description
Standard	CE100	Electro-Pneumatic	5	-D	ATEX: Gas Ex d
				-P	ATEX: Gas/Dust Ex d
				-E	ATEX: Gas Ex ia

V100 Series Pneumatic & Electro-Pneumatic Positioners

for 2-Way or 3-Way Pneumatically-Actuated Valves

Valve Positioners (Pneumatic or Electro-Pneumatic)



The V100 Series Valve Positioners (Pneumatic/Electro-Pneumatic) offer enhanced features ideal for applications where extreme accuracy is required. Designed to mount to a pneumatically-actuated control valve to improve control accuracy and increase maximum close-off pressure capability of the valve.

The V100P Pneumatic Positioner receives a 3-15 PSIG air signal normally taken from an I/P Transducer.

The V100E Electro-Pneumatic Positioner receives an electrical 4-20 mA signal directly from the PID Controller and therefore eliminates the need for a separate I/P Transducer.



HB-Series Control Valve shown with V100E Positoner with Gauge Blocks and Gauges (included) and optional Stainless Steel 50in² Actuator

	Pneumatic V100P	Electro-Pneumatic V100E
Input Signal	3-15 PSI (0.2 - 1.0 Bar)	4-20 mA
Supply Air Pressure	145 PSI maximum	20 to 145 PSIG
Action	Single-Acting	Single-Acting
Air Connection	1/4" NPT (Gauge 1/8" NPT)	1/4" NPT (Gauge 1/8" NPT)
Electrical Connection	N / A	1/2" NPT
Pressure Gauges	Included	Included
Cam	Linear Characteristics	Linear Characteristics
Ambient Temperature	-40° to 185° F (-40° - 85° C)	-40° to 185° F (-40° - 85° C)
Enclosure Material	Die Cast Aluminum with Polyester Epoxy Coating	Die Cast Aluminum with Polyester Epoxy Coating
Enclosure Rating	NEMA 4X / IP66	NEMA 4X / IP66
Weight	3.5 lbs. (1.6 kg)	3.8 lbs. (1.7 kg)
Optional Explosion Protection	Consult Factory	Refer to Options Chart Below
Linear Error	0.7% full span	
Hysteresis	0.4% full span	
Repeatability	0.3% full span	
Media	Oil-free instrument Air Filtered to 5 micron	
Flow Capacity	SCFM	
@20 PSI	9.5	
@87 PSI	28.3	
Air Consumption	SCFM	SCFM
@20 PSI	0.18	0.2
@87 PSI	0.53	0.6

CONTROL VALVES

V100 Pneumatic & Electro-Pneumatic Positioner Options

Type	Model Code	Features	Weight lbs.	Options	
				Suffix Code	Description
Standard Positioners	V100E	Electro-Pneumatic	5	V250001	(2) SPDT Mechanical Switches
	V100P	Pneumatic	5		
Optional	V100-EX	Electro-Pneumatic (Explosion-Proof)	5	V250001	(2) SPDT Mechanical Switches
	V100-EX-ATEX	Electro-Pneumatic (Explosion-Proof w/ ATEX Approval)	5		
	V100-EX-IS	Electro-Pneumatic (Intrinsically Safe)	5	V250007	4-20mA Feedback
	V100-EX-10V	Electro-Pneumatic (0-10V 1/P)	5		

for 2-Way or 3-Way Pneumatically-Actuated Valves




HB-Series Control Valve
 shown with
MVP3500 Positoner
 with Gauge Blocks (included)
 optional Stainless Steel
 50in² Actuator

The **MVP3500** is a digital positioner that mounts to the pneumatic actuator of control valves to improve accuracy and increase maximum close-off pressure capability of the valve. Digital positioners use piezo-electric valves for the air supply which limit leakage, making them much more efficient than electro-pneumatic positioners.

Set-up and calibration are also greatly simplified by the use of local push-buttons and LCD, eliminating the need for expensive handheld devices for basic set up and calibration. The **MVP3500** comes standard with 4-20mV feedback, Hart communication, gauge blocks and gauges.

The **MVP3600** is an Explosion-Proof model.

SPECIFICATIONS	
Model	MVP3500
	
Signal	4-20mA
Feedback	4-20mA
Supply Pressure	22 - 101 PSIG
Air Consumption	.020 SCFM
Ambient Temperature Range	-40° - 158° F
Rotation Range	30° - 120° F
Linear Stroke Range	0.39 - 3.94 in.
Characteristics Curves	Linear, 1:30, 30:1, Custom
Deadband	0.1% - 10% Adjustable
Communication	HART
Enclosure Rating	IP65
Air Connections	1/4" NPT
Electrical Connections	1/2" NPT
Explosion Protection	Ex ia IIC T4-T6 Ga Ex iaD 20 T80 ° C/T95 ° C/T130 ° C
	MVP3600
	ATEX: Ex d IIC T4 - T6 Ga Ex td A21 IP65 T80 ° C / T90 ° C / T105 ° C

HB Series "SMART" Positoner Options				
Model Code	Features	Weight lbs.	Options	
			Model Code	Description
MVP3500L-10H-KFO-M00-EWM	Standard Digital (Single-Action), 4-20mV Feedback - Included: HART Communication, Gauge Blocks & Gauges.	5	All Options Included	
MVP3600L-1PH-F0-M00-EWM	Explosion Protection Digital (Single-Action), 4-20mV Feedback - Included: HART Communication, Gauge Blocks & Gauges.	5		


CONTROL VALVES

for 2-Way or 3-Way Pneumatically-Actuated Valves



HB-Series Control Valve
shown with
D400 Positoner
with Gauge Blocks (included)
optional Stainless Steel
50in² Actuator

The **D400** is a digital positioner with Intrinsically-Safe or Explosion-Proof options. These positioners are designed to be highly accurate and efficient in a wide range of application environments. HART communication and 4-20mA feedback are available as options.

SPECIFICATIONS	
Model	D400
	
Signal	4-20mA
Feedback	Optional 4-20mA
Supply Pressure	22 - 90 PSIG
Air Consumption	.015 SCFM
Ambient Temperature Range	-40 ° - 185 ° F
Rotation Range	250 ° - 120 ° F
Linear Stroke Range	0.4 - 4.0 in.
Characteristics Curves	Linear ,Eq %, 1:25, 1:50 50:1, Custom
Deadband	0.1% - 10% Adjustable
Communication	Optional HART
Enclosure Rating	NEMA 4X / IP65
Air Connections	1/4" NPT
Electrical Connections	1/2" NPT
	D400-IS (Intrinsically Safe)
	ATEX: II 2G EEx ib IIC T6 II 2G EEx ia IIC T6 II 3G EEx n A II T6 II 2D IP 6X T 46 ° C IECEX: EXIB IIC T6
	D400-EX (Explosion-Proof)
	ATEX: II 2G EEx ib IIC T6 IECEX: EXIB IIC T6

CONTROL VALVES

HB Series "SMART" Positioner Options				
Model Code	Features	Weight lbs.	Options	
			Suffix Code	Description
D400	Standard Digital (Single-Action) - No Communication	5	-H	Hart Communication
D400-IS	Digital (Intrinsically Safe) - No Communication	5	V240007	Single Gauge Block
D400-EX	Digital Explosion-Proof - No Communication	5	-FB	4-20mV Feedback
			-HFB	Hart Communication & Feedback

Other Options Available; Contact Factory