

Electric Actuators for 2-Way or 3-Way

Models	2 & 3-Way Valves with E-Series or SK-Series Electric Actuators
Service 2-Way Valve	Steam, Air, Water
Service 3-Way Valve	Liquid ONLY (NO STEAM)
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	Actuator Dependent

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 & 3-Way Control Valves with **Electric Actuators** are a robust, user-friendly alternative to the Pneumatically-Actuated unit. They are ideal for installations where an instrument air source is not available or when the benefits for electric actuation are preferred.

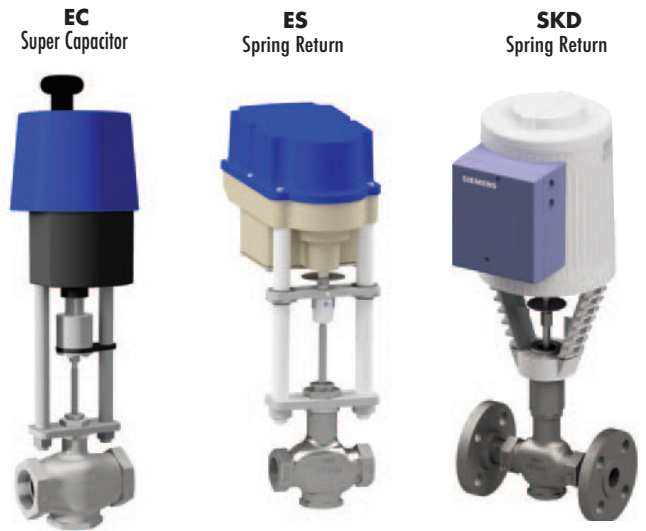
Electric Actuators utilize either **Super Capacitors** or **Spring Return** which allow for the valve to fail in either the fully-open or fully-closed position in the event of power loss or signal failure.

The **EC Model** using Super Capacitor should be selected when Ultra-fast response times are needed such as in instantaneous hot water heater applications. The **EC Model Actuator** will cycle from Open to Close in approximately 6 seconds.

The **ES Model** using Spring Return are an economical choice when medium response times are sufficient. They have Fail-Open and Fail-Close options as well as 24 VDC service.

The **SK Series Electric Actuators** are used for general purpose applications where medium response times are sufficient. They are an economical choice for **Heating, Boiler Feed Water** applications as well as **On/Off HVAC Steam Control**.

SK Actuators Fail Closed, typically not used for Cooling applications.



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
Action Options	Fail Open*
	Fail Closed
Actuator Options	Fast-acting, Super Capacitors
	On-Off, Spring Return

* 2-way HB-Series with SK-Series Actuators are Fail-Closed only.

Valve Design conforms to ANSI/ASME B 16.34

Fail-Safe Operator	E-Series			SK-Series		
	Capacitor	Spring		Spring		
Actuator	EC10	EC	ES	SKB	SKC	SKD
Voltage	115VAC / 24VAC / 24VDC			24VAC*		
Max Ambient Temp	140°F			130°F		122°F
Enclosure Rating	IP65			IP54 / NEMA 1		
Stroke (in)	1.97	1.97	1.57	0.75	1.50	0.75
Thrust (lbs)	2,248	1,011	449	629		224
Cycle Time open (s)	15	8	120	120	120	60
Cycle Time close (s)	15	8	90	15	20	15
Weight (lbs)	22	18	12.4	18.9	22.5	8.5

* 115VAC service available with optional power adapter.

Electric Actuators for 2-Way or 3-Way

Size	Connection	Valve Model Code		E-Series Actuator			SK-Series Actuator		
				EC Super Capacitor	EC10 Super Capacitor	ES Spring Return	SKD STANDARD	SKB	SKC
		Full Port	Cv	Max Close-Off Pressure (PSI Δ P)					
1/2"	NPT	HB1000F-12N	5	720	N/A	605	290	720	720
3/4"	NPT	HB1000F-13N	6.5	720	N/A	605	290	720	720
1"	NPT	HB1000F-14N	10	720	N/A	605	290	720	720
1 1/2"	NPT	HB1000F-16N	22	720	N/A	315	150	450	450
2"	NPT	HB1000F-17N	42	380	N/A	160	75	280	230
1/2"	150# FLG	HB1000F-121	5	275*	N/A	275*	275*	275*	275*
3/4"	150# FLG	HB1000F-131	6.5	275*	N/A	275*	275*	275*	275*
1"	150# FLG	HB1000F-141	10	275*	N/A	275*	275*	275*	275*
1 1/2"	150# FLG	HB1000F-161	22	275*	N/A	275*	150	275*	275*
2"	150# FLG	HB1000F-171	42	275*	N/A	160	75	230	230
2 1/2"	150# FLG	HB1000F-181	70	175	380	74	N/A	N/A	108
3"	150# FLG	HB1000F-191	110	134	290	54	N/A	N/A	80
4"	150# FLG	HB1000F-201	170	72	160	29	N/A	N/A	43
1/2"	300# FLG	HB1000F-123	5	720	N/A	605	290	720	720
3/4"	300# FLG	HB1000F-133	6.5	720	N/A	605	290	720	720
1"	300# FLG	HB1000F-143	10	720	N/A	605	290	720	720
1 1/2"	300# FLG	HB1000F-163	22	720	N/A	315	150	450	450
2"	300# FLG	HB1000F-173	42	380	N/A	160	75	230	230
2 1/2"	300# FLG	HB1000F-183	70	175	380	74	N/A	N/A	108
3"	300# FLG	HB1000F-193	110	134	290	54	N/A	N/A	80
4"	300# FLG	HB1000F-203	170	72	160	29	N/A	N/A	43

* Shut-off pressure limited by flange class rating.

To complete Full Model Code, Must Specify: **Trim, Packing, Port, Actuator, Power Supply and Control Signal Type**

CONTROL VALVES

Model Code Configuration Chart

HB Series; 1/2" - 4", Electrically-Actuated, 2-Way or 3-Way Valve Bodies

Example: (Spring-Fail Closed): HB1000F-12N-ESA10

Example: (Spring-Fail Open): HB1000F-12N-ESB10

VALVE BODY Selection								CONNECTION				EC ACTUATOR - Super Capacitor Fail-Safe																													
Model	Code	Trim Style*	Code	Seat Type	Code	Packing	Code	Port Type	Code	Size	Code	Connection	Code	Actuator	Code	Power Supply	Code	Control Signal																							
HB1	0	Equal Percentage (2-way)	0	Metal Seat	0	Teflon	F	Full Port	12	1/2"	N	NPT	ECA	Capacitor-Fail-Closed	1	115 VAC	0	4-20mA																							
				Stainless Steel															1	0-10V																					
				Steel															2	0-20mA																					
				1															Linear (2-way)	1	Soft Seat	16	Teflon	R	Reduced Port	13	3/4"	1	150# FLG	EC10A	Capacitor-Fail-Open	2	24 VAC/DC	3	2-10V						
																																				17	2"	B	BSP	4	12-20mA
																																				18	2 1/2"	P	PN16 FLG	6	Split-range
	3	3-Way	C.F	Elastomers	19	EPDM	C.F.	Viton	14	1"	3	300# FLG	ECB	Capacitor-Fail-Open	3	24 VAC/DC	4	2-10V																							
																			17	2"	B	BSP	4	12-20mA																	
																			18	2 1/2"	P	PN16 FLG	6	Split-range																	
	3	3-Way	C.F	Elastomers	19	EPDM	C.F.	Viton	15	1 1/2"	6	600# FLG	EC10B	Capacitor-Fail-Open	3	24 VAC/DC	4	2-10V																							
																			17	2"	B	BSP	4	12-20mA																	
																			18	2 1/2"	P	PN16 FLG	6	Split-range																	
3	3-Way	C.F	Elastomers	19	EPDM	C.F.	Viton	16	2"	B	BSP	EC10B	Capacitor-Fail-Open	3	24 VAC/DC	4	2-10V																								
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3	3-Way	C.F	Elastomers	19	EPDM	C.F.	Viton	17	2"	B	BSP	EC10B	Capacitor-Fail-Open	3	24 VAC/DC	4	2-10V																								
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																		17	2"	B	BSP	4	12-20mA																		
																		18	2 1/2"	P	PN16 FLG	6	Split-range																		
3	3-Way	C.F	Elastomers	19	EPDM	C.F.	Viton	19	3"	Q	PN25 FLG	EC10B	Capacitor-Fail-Open	3	24 VAC/DC	4	2-10V																								
																		17	2"	B	BSP	4	12-20mA																		
																		18	2 1/2"	P	PN16 FLG	6	Split-range																		
3	3-Way	C.F	Elastomers	19	EPDM	C.F.	Viton	20	4"	Q	PN25 FLG	EC10B	Capacitor-Fail-Open	3	24 VAC/DC	4	2-10V																								
																		17	2"	B	BSP	4	12-20mA																		
																		18	2 1/2"	P	PN16 FLG	6	Split-range																		

* Note: For 2-Way Valves Equal Percentage trim style should be used for steam service. Linear trim style should be used for water service.

ELECTRIC ACTUATOR OPTIONS			
EC Series	ES Series	SK Series	
Heating Resistor for protection in cold outdoor climates	Contact Factory	None	Weather Shield Assembly Kit for outdoor use. UL Listed to meet NEMA 3R rating.
Communication Kit for field adjustments, data access, etc.	EC-COMM-KIT		115 VAC Power Adapter
Transformer for 230 VAC Service	Contact Factory		266010

ES ACTUATOR - Spring Fail-Safe				
ESA	Spring-Fail-Closed	1	115 VAC	0 4-20mA
ESB	Spring-Fail-Open	2	24 VAC/DC	1 0-10V
				2 0-20mA
				3 2-10V

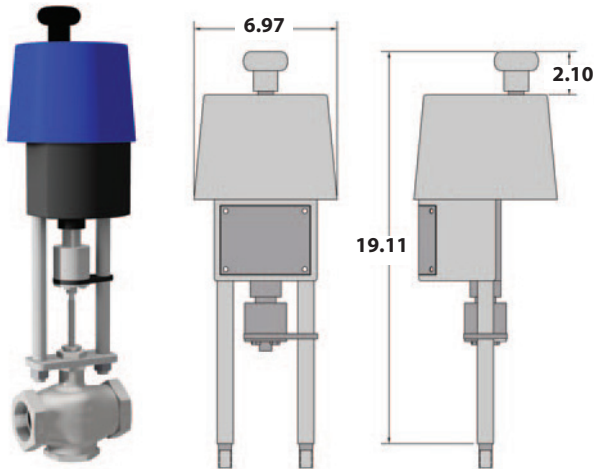
SK ACTUATOR - Spring Fail-Safe	
SKD62UA	SK Actuators are standard 24VAC with 4-20mA control signal. For 115VAC, add Power Adapter. 0-10V control signal option can be field set.
SKB62UA	
SKC62UA	

Failure Mode on SK Actuators:
 2-Way Valves Fail-Closed.
 3-Way Valves close-off the "A" Port.

E-Series Electric Actuators for 2-Way or 3-Way

EC/EC10 Electric Actuator

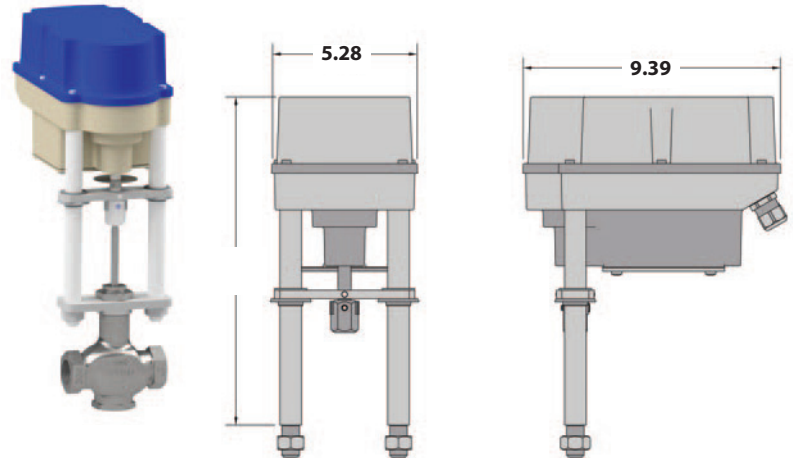
Uses Super Capacitors as the Fail-Safe Operator
Extremely Fast Acting



The **EC/EC10 Electric Actuator** are used for High-performance applications such as instantaneous hot water heaters.

ES Electric Actuator

Uses a Spring as the Fail-Safe Operator
Reduced Response Time & Close-Off Pressures



The **ES Electric Actuator** are used where high-speed actuation is not required.

CONTROL VALVES

Actuator Specifications	EC			EC10			ES		
	115VAC	24VAC	24VDC	115VAC	24VAC	24VDC	115VAC	24VAC	24VDC
Power Supply									
Force	1,100 lbs			2,248 lbs			448 lbs		
Velocity	0.177 in/sec			0.067 in/sec			0.012 in/sec		
Nominal 1" Travel Time	8 sec			15 sec			60 sec		
Nominal Current (A)	0.66	3.15	2	.84	4	2.5	0.14	.35	
Max Current (A)	0.86	4.1	2.6	1.1	5.3	3.3	0.14	.35	
Max Power Consumption	57	53	48	78	73	61	9	9	
Duty Cycle, IEC 60034-1, 8	S2 30 min S4 50% ED @ 77° F						S2 30min S4-1200c/h-50%ED		

Motor Protection	Electric motor current monitoring with safety cut-off
Set Value Feedback	0 (4)-20mA or 0 (2)-10V selectable, split range operation
Binary Control	24V for On/Off Control (1s min pulse duration)
Valve Positioner Function	Integrated positioner, deadband adjustable from 0.5 to 5%, shutoff min.
Automatic Start-up	Recognizing the end position(s) and autoscaling set and feedback values
Internal Fault Monitoring	Torque, set value, temperature, power supply, positioning deviation, etc.
Diagnostics Function EC-Series ONLY	Stores accumulated operation data (motor & total run time, number of starts) and data of current values (set value, feedback value, torque, temp, and error message)
Communication Interface	USB interface with Software / enables parameter adjustments
Cable Glands	2x M20x1.5 & 1x M16x1.5

The EC Actuator can be factory set or field configurable (with COMM-KIT) as follows:

- Stroke adjustment
- Stroke velocity
- Response time
- Fail-safe direction and position
- Flow characteristic (i.e. equal %, linear, quick open)

Options for EC

Transformer for 230 VAC Service

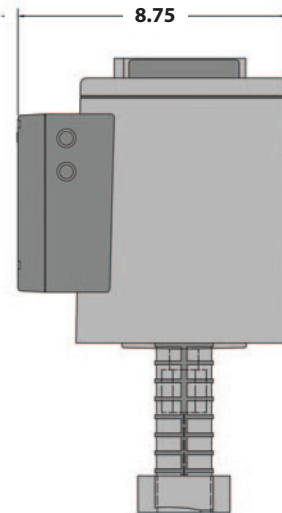
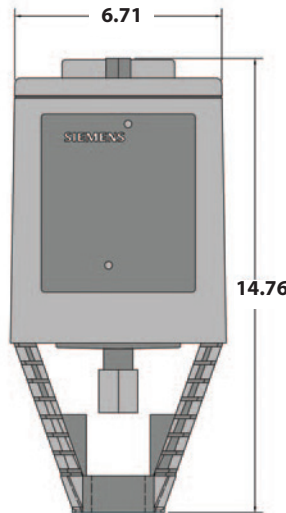
Limit Switch

Heater Element

SK-Series Electric Actuators for 2-Way or 3-Way

SKB • SKC • SKD

Electric Actuators



The **SK Series Electric Actuators** are a robust choice for **Boiler Feed Water** applications as well as **On/Off HVAC Steam Control** applications where **Fail-Closed is required**. For general purpose applications, where medium response times are sufficient. In the event of a signal failure, the stem of the SK Actuator retracts. Therefore the Failure Mode of a 2-Way valve is closed and a 3-Way valve will close off the “A” port.

Actuator Specifications	SKB	SKC	SKD
Power Supply	24VAC		
Force	629 lbs		224 lbs
Velocity	0.006 in/s	0.013 in/s	0.025 in/s
Nominal 1" Travel Time	120	60	30
Nominal Current (A)	.5	.84	.5
Max Current (A)	.5	.84	.5
Max Power Consumption (W)	12	20	12
Agency Certification	UL873, CE 89/336/EEC		

Option:

Power Adapter for 115 VAC Service

Actuator Selection

SKD Series

Standard for 1/2" to 2" valve bodies where a 30 second stroke time is preferable.

SKC Series

Standard for 2 1/2" to 4" valve bodies and also when higher shut-off pressures are required for 1/2" to 2" valve bodies.

SKB Series

Option for higher shut-off pressure applications where increased stroke time can be tolerated.

HB Control Valves

2-Way Valves with Electric Actuators

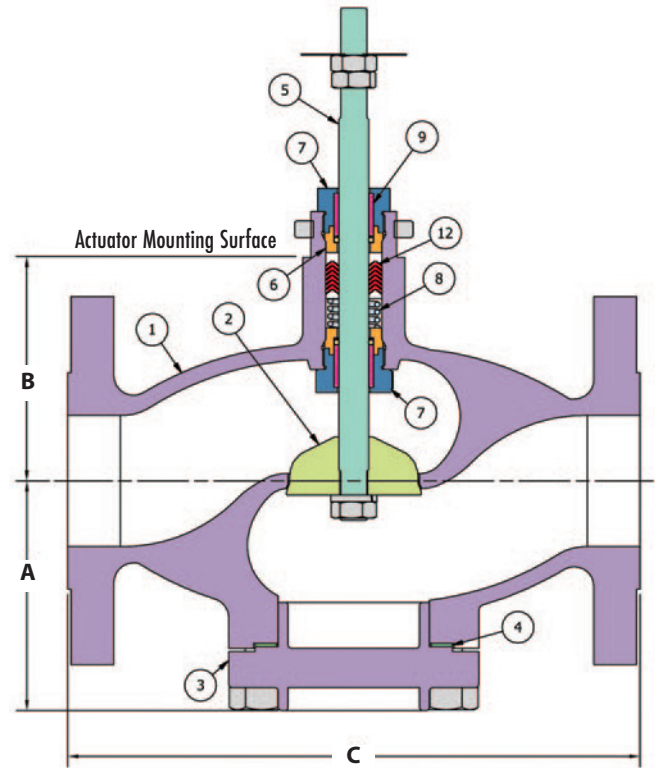
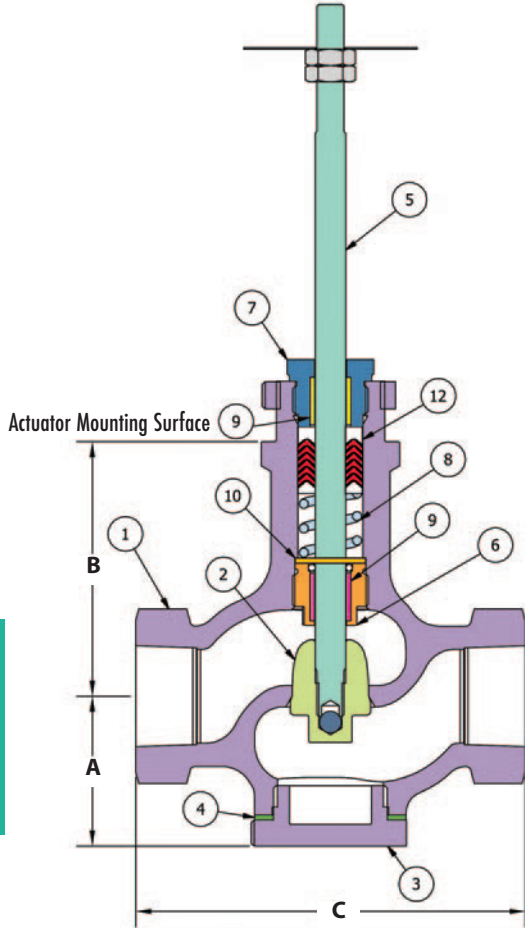
ELECTRIC ACTUATORS

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	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

Insulation Blankets; Contact Factory

Note: Insulation blankets are recommended for electrically actuated valves when steam supply pressure exceeds 55 PSIG or fluid temperature 300 ° F and above.

MAXIMUM FLOW COEFFICIENT (Cv)

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

3-Way Valves with Electric Actuators

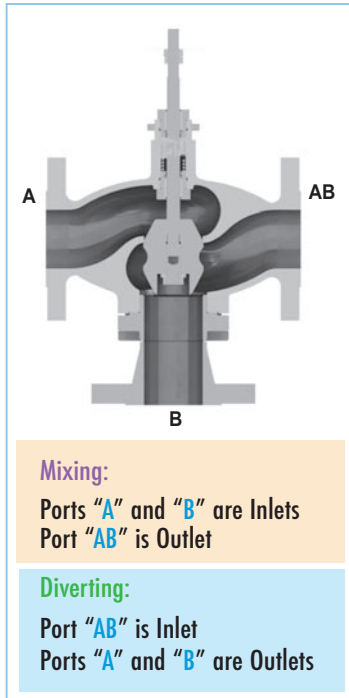
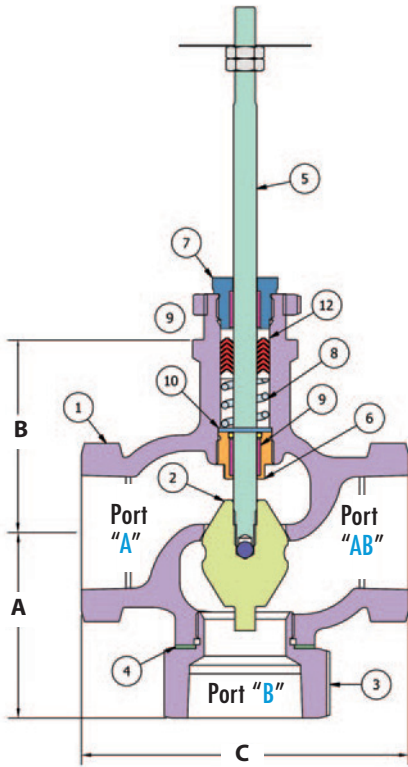
for MIXING & DIVERTING • Liquid ONLY (NO STEAM)

3-Way • 1/2 – 4"

3-Way for Mixing or Diverting

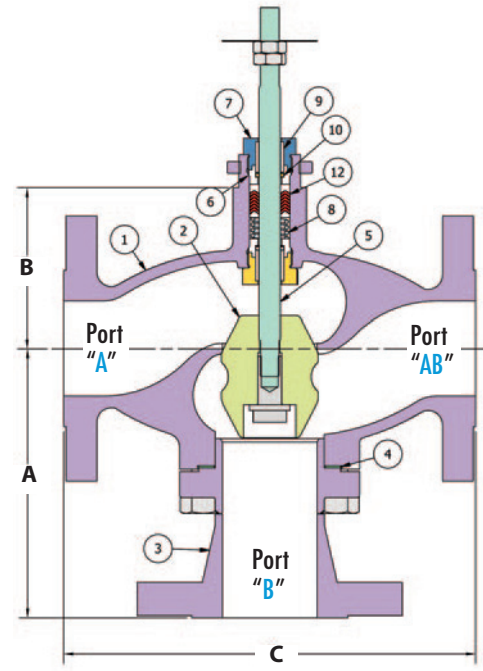
1/2" to 2"
Threaded & Flanged

2 1/2" to 4"
Flanged



Mixing:
Ports "A" and "B" are Inlets
Port "AB" is Outlet

Diverting:
Port "AB" is Inlet
Ports "A" and "B" are Outlets



CONTROL VALVES

Item	Description	Material
1	Body	316 Stainless Steel
2	Valve Plug*	Hardened 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	303 Stainless Steel
12	V-ring Stem Seals*	PTFE

* Recommended Spare Parts

Size	A		B		C			Weight (lbs)		
	NPT	150	300	NPT	150#	300#	NPT	150#	300#	
1/2"	2.31	2.95	4	4	4.50	7.25	7.75	4	8.5	9
3/4"	2.31	2.95	4	4	4.50	7.25	7.75	4	8.5	9
1"	2.31	2.95	4	4	4.50	7.25	7.75	5.5	12	13.5
1 1/2"	2.84	2.95	4.3	4.3	5.00	8.75	9.25	7	18.5	22
2"	3.19	2.95	5	5	6.00	10	10.5	11	26	35
2 1/2"	-	4.25	7.13	7.38	-	10.88	11.5	-	50	58
3"	-	4.25	8.32	8.5	-	11.75	12.5	-	74	88
4"	-	4.25	9.19	9.5	-	13.88	14.5	-	106	136

Insulation Blankets; Contact Factory

Note: Insulation blankets are recommended for electrically-actuated valves when fluid temperature 300 ° F and above.

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

CAPACITIES – Steam (lbs/hr)											
Inlet Pressure (PSIG)	Outlet Pressure (PSIG)	ΔP PSI	Reduced Port 1/2"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
C _v Factors			3.5	5.0	6.5	10	22	42	70	110	170
Orifice Size (in)			0.88	0.88	0.88	0.88	1.25	1.75	2.5	2.88	3.88
5	4	1	48	68	89	136	300	573	955	1501	2320
	0	5	96	137	178	274	602	1149	1915	3009	4650
	-4	9	114	162	211	325	714	1363	2272	3570	5518
	-8	13	119	170	220	339	746	1424	2374	3730	5765
10	9	1	53	76	99	153	336	641	1068	1678	2593
	5	5	110	156	203	313	689	1315	2191	3443	5321
	0	10	138	197	255	393	865	1651	2751	4324	6682
15	-7	17	148	211	274	422	929	1773	2955	4643	7176
	10	5	122	174	226	348	765	1460	2433	3824	5909
	5	10	156	223	290	447	983	1876	3127	4913	7593
20	0	15	172	246	320	492	1082	2066	3444	5412	8364
	-5	20	177	252	328	505	1110	2119	3532	5550	8578
	15	5	133	189	246	379	833	1591	2652	4167	6440
30	10	10	173	247	321	494	1088	2076	3460	5438	8404
	5	15	194	277	361	555	1221	2330	3883	6103	9431
	-3	23	205	293	381	587	1291	2464	4106	6453	9972
50	25	5	152	217	282	434	955	1822	3037	4773	7377
	15	15	232	331	431	663	1459	2785	4641	7293	11271
	5	25	260	371	482	742	1631	3115	5191	8157	12606
	0	30	262	375	487	750	1649	3149	5248	8247	12745
80	40	10	250	357	464	714	1570	2997	4995	7850	12132
	30	20	324	463	601	925	2035	3886	6476	10177	15728
	15	35	370	529	687	1057	2326	4440	7399	11628	17970
	7	43	376	537	697	1073	2361	4507	7511	11804	18242
100	70	10	307	438	570	877	1929	3682	6136	9643	14903
	50	30	472	675	877	1350	2970	5670	9450	14850	22950
	30	50	534	763	992	1525	3356	6407	10678	16780	25932
	17	63	544	777	1010	1554	3418	6526	10876	17091	26413
150	85	15	406	580	754	1160	2552	4872	8121	12761	19722
	60	40	586	837	1089	1675	3684	7034	11723	18422	28470
	40	60	643	918	1193	1836	4039	7710	12851	20194	31209
	23	77	655	936	1217	1872	4119	7864	13107	20596	31831
200	110	15	452	645	839	1290	2838	5418	9030	14190	21930
	85	40	668	954	1240	1908	4199	8015	13359	20993	32443
	50	75	782	1117	1452	2233	4913	9380	15634	24567	37968
	31	94	794	1135	1475	2270	4993	9532	15887	24965	38582
250	130	20	560	800	1040	1600	3519	6718	11197	17595	27192
	100	50	800	1143	1485	2285	5027	9598	15996	25137	38847
	70	80	904	1291	1678	2582	5680	10844	18074	28402	43893
	40	110	933	1333	1733	2666	5865	11196	18661	29324	45319
300	150	25	666	952	1237	1903	4187	7994	13323	20936	32356
	115	60	931	1329	1728	2659	5850	11167	18612	29248	45201
	75	100	1052	1503	1953	3005	6612	12622	21037	33058	51089
	48	127	1072	1531	1990	3062	6736	12859	21432	33679	52049
350	175	25	713	1018	1324	2037	4481	8554	14257	22404	34625
	130	70	1061	1515	1970	3031	6668	12730	21216	33340	51425
	90	110	1183	1690	2196	3379	7434	14192	23654	37170	57444
	56	144	1210	1729	2247	3457	7606	14521	24202	38031	58775
400	225	25	798	1140	1482	2281	5017	9578	15964	25086	38770
	170	80	1273	1819	2364	3637	8002	15276	25259	40008	61830
	120	130	1443	2062	2680	4124	9072	17319	28865	45359	70100
	73	177	1487	2125	2762	4249	9348	17846	29744	46740	72235
450	270	30	951	1359	1766	2718	5979	11414	19023	29894	46199
	200	100	1535	2193	2850	4385	9648	18418	30697	48238	74549
	140	160	1723	2461	3199	4922	10828	20672	34454	54142	83674
	89	211	1765	2521	3277	5042	11093	21177	35296	55465	85718

Note: The Steam Capacity Chart is based on ISA Standard 75.01.01-2007 (60534-2-1 Mod). It assumes pipe sizes equal to the size of the valve ports, with no attached fittings.

Sizing & Capacity Chart

WATER

CAPACITIES – Water (GPM)											
Inlet Pressure (PSIG)	Outlet Pressure (PSIG)	ΔP PSI	Reduced Port 1/2"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
C _v Factors			3.5	5.0	6.5	10	22	42	70	110	170
Orifice Size (in)			0.88	0.88	0.88	0.88	1.25	1.75	2.5	2.88	3.88
5	4	1	3.5	5.0	6.5	10	22	42	70	110	170
	0	5	7.8	11	15	22	49	94	157	246	380
10	7	3	6.1	8.7	11	17	38	73	121	191	294
	5	5	7.8	11	15	22	49	94	198	311	481
	0	10	11	16	21	32	70	133	251	246	380
15	10	5	7.8	11	15	22	49	94	157	246	380
	5	10	11	16	21	32	70	133	221	348	538
	0	15	14	20	26	39	86	165	275	432	668
30	25	5	7.8	11	15	22	49	94	157	246	380
	15	15	14	19	25	39	85	163	271	426	658
	7	23	17	24	31	48	106	203	338	531	821
50	40	10	11	16	21	32	70	133	221	348	528
	30	20	16	22	29	45	98	188	313	492	760
	16	34	20	29	38	58	128	244	407	640	898
80	70	10	11	16	21	32	70	133	221	348	538
	50	30	19	27	36	55	120	230	383	602	931
	30	50	25	35	46	70	155	296	493	775	1198
100	85	15	14	19	25	39	85	163	271	426	658
	65	35	21	30	38	59	130	248	414	651	1006
	40	60	27	39	50	78	171	326	543	853	1319
125	110	15	14	19	25	39	85	163	271	426	658
	85	40	22	32	41	63	139	266	443	696	1075
	52	73	30	43	56	86	188	360	600	492	760
150	130	20	16	22	29	45	98	188	313	492	760
	100	50	25	35	46	71	156	297	495	778	1202
	63	87	33	47	60	93	205	391	651	1023	1581
200	175	25	18	25	33	50	110	210	350	550	850
	130	70	29	42	54	84	184	351	586	920	1422
	87	113	37	53	69	106	234	446	744	1169	1806
250	225	25	18	25	33	50	110	210	350	550	850
	170	80	31	45	58	89	197	376	626	984	1521
	111	139	41	59	77	118	260	495	826	1298	2006
300	270	30	19	27	36	55	120	230	383	602	931
	200	100	35	50	65	100	220	420	700	1100	1700
	134	166	45	64	84	129	283	540	901	1415	2187

- Notes: 1) Capacities based on 70°F water (SG = 1.00).
 2) Capacities based on 100% of C_v.
 3) Maximum capacities are based on pressure drop at constant cavitation at 70°F.
 4) Cavitation adapters available to prevent cavitation.

CONTROL VALVES

HB Series Mixing & Diverting (3-Way Valves)

CAPACITIES – Water (GPM)

3-WAY VALVES

Inlet pressures should be within 5% of each other. Specify if service is for other than water.

Pressure Drop (PSI Δ P)	Size, Body Number & Coefficient (Cv)							
	1/2" Cv = 5	3/4" Cv = 6.5	1" Cv = 10	1 1/2" Cv = 22	2" Cv = 42	2 1/2" Cv = 70	3" Cv = 110	4" Cv = 170
1	5	6.5	10	22	42	70	110	170
3	8.7	11.3	17.3	38	73	121	191	294
5	11.2	15	22	49	94	157	246	380
10	15.8	21	32	70	133	221	348	538
15	19	25	39	85	163	271	426	658
20	22	29	45	98	188	313	492	760
25	25	33	50	110	210	350	550	850
30	27	36	55	120	230	383	602	931
40	32	41	63	139	266	443	696	1075
50	35	46	71	156	297	495	778	1202
60	39	50	77	170	325	542	852	1317
70	42	54	84	184	351	586	920	1422
80	45	58	89	197	376	626	984	1521
90	47	62	95	209	398	664	1044	1613
100	50	65	100	220	420	700	1100	1700
125	56	73	112	246	470	783	1230	1901
150	61	80	122	269	514	857	1347	2082
175	66	86	132	291	556	926	1455	2249
200	71	92	141	311	594	990	1556	2404
225	75	98	150	330	630	1050	1650	2550
250	79	103	158	348	664	1107	1739	2688

- Notes:
- 1) Capacities based on 70°F water (SG = 1.00).
 - 2) Capacities based on 100% of Cv.
 - 3) Maximum capacities are based on pressure drop at constant cavitation at 70°F.
 - 4) Cavitation adapters available to prevent cavitation.