Bray COMMERCIAL

CONTENTS

DOCUMENT

12/07/21

SoftTouch 2 Series

Characterized Ball Valves

2-Way & 3-Way • 1/2"- 2"

The Soft Touch 2 (ST2) Series characterized ball valves provide accurate and cost effective control of a wide range of equipment in HVAC applications.

The ST2 series features a forged brass 2-piece body with Stainless Steel balls and stems for water temperature up to 284˚F (140˚C) and saturated steam up to 15 PSI.

The Amodel® Flow Characterizing Disk maintains equal percentage Flow Characteristics for optimum temperature control. The blowout-proof stem and mounting flange, combined with an inovative double O-Ring stem seal and self-centering stem bushing design provides quick and easy electric actuator field mounting while ensuring long life and leak-free valve performance.

Graphite reinforced PTFE seats backed with EPDM O-Rings significantly reduce operating torque allowing the use of the most economical actuator to provide the torque required for the application. All valve and actuator assemblies provide 200 psig (1,379 kPa) close-off pressure while ensuring operation after long idle periods. Because of their cost-effective, reliable design, ST2 Series Ball Valves are maintenance free.

Features and Benefits

5 Year Warranty

- 580 PSI (PN 40) Body Rating
  Meets any HVAC application
- 200 PSI Close-Off Rating
  Worry-free at high differential pressures
- ANSI Class IV (<.01%) Leakage
  Energy efficient
- Low Torque
  Minimizes actuator costs/extends life
- Greater than 500:1 Rangeability
  Superior control accuracy and stability

SoftTouch 2 - Specifications

Technical Specifications

Service		Hot Water, Chilled Water, 50/50 Glycol Solutions 15 PSIG (103 kPa) Saturated Steam for HVAC Systems
Valve Body Pressure/ Temperature Rating	Cold Working Pressure (CWP) Water (with Standard Mounting) Water (with "High Temp" Mounting) Steam (with "High Temp" Mounting)	580 PSI (PN 40) -22˚F to 203˚F (-30˚C to 95˚C) -22˚F to 284˚F (-30˚C to 140˚C) 15 PSIG (103 kPa) at 284˚F (140˚C)
Maximum Recommended Operating Pressure Drop		50 PSI Maximum Differential Pressure for Valves with Characterized Flow Control Disk and 30 PSI Maximum for Quiet Service Ball Valves
Flow Characteristics	**Two-Way** **Three-Way**	Equal Percentage Equal Percentage Port A, Linear Port B (Bypass)
Rangeability		Greater than 500:1
Minimum Ambient Operating		See Actuator Specifications
Leakage		.01% of Maximum Flow per ANSI/FCI 70-2, Class 4 1% of Maximum Flow for Three-Way Bypass Port
End Connections		NPT or BSP
Materials	**Body**	Forged Brass
	Ball	300 Series Stainless Steel
	Stem	300 Series Stainless Steel
	Seats	Graphite-Reinforced PTFE with EPDM O-Ring backing
	Stem Seals	EPDM Double O-Rings
	Characterizing Disk	Amodel®
Close-Off		200 PSI
Compliance CRN		OC16910.5
Warranty		5 Years limited from time of shipment.

Disclaimer - *The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond*

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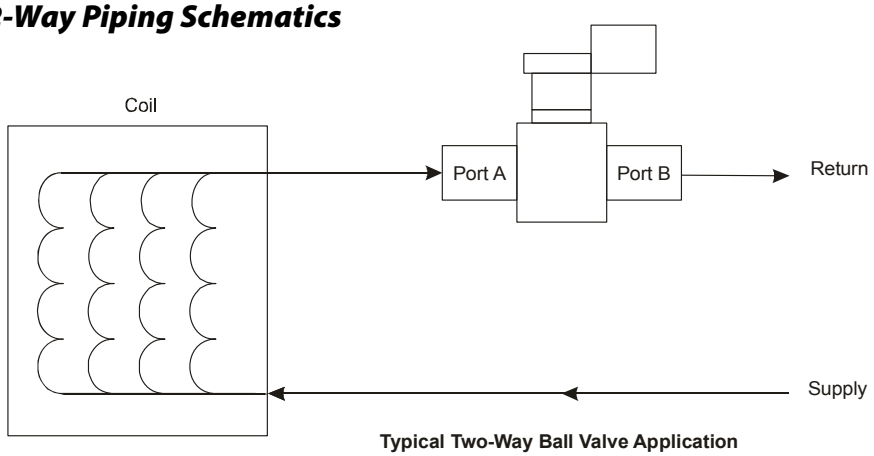
2-Way Piping Schematics



Typical Two-Way Ball Valve Application

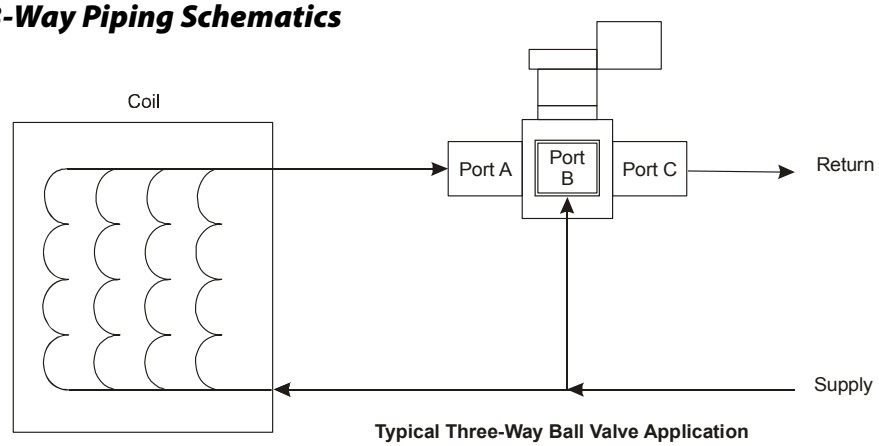
Note: Mount the valve downstream from the coil to minimize heat transfer to the actuator.

2-Way - Default Configuration for ST2 Ball Valves

Valve Position at Actuator Position	2-Way Non Spring Return	2-Way Spring Return N.O	2-Way Spring Return N.C.
Valve Position w/ Act CCW	Open	Open	Open
Valve position w/Act CW	Closed	Closed	Closed
Valve Position w power removed	Last Position	Open	Closed
Proportional actuator control signal Action (Direct Acting)*	CCW at 0; CW at Max	CCW at 0, CW at Max	CW at 0, CCW at Max

**Proportional actuators include a switch to field convert from Direct Acting to Reverse Action*

3-Way Piping Schematics



Typical Three-Way Ball Valve Application

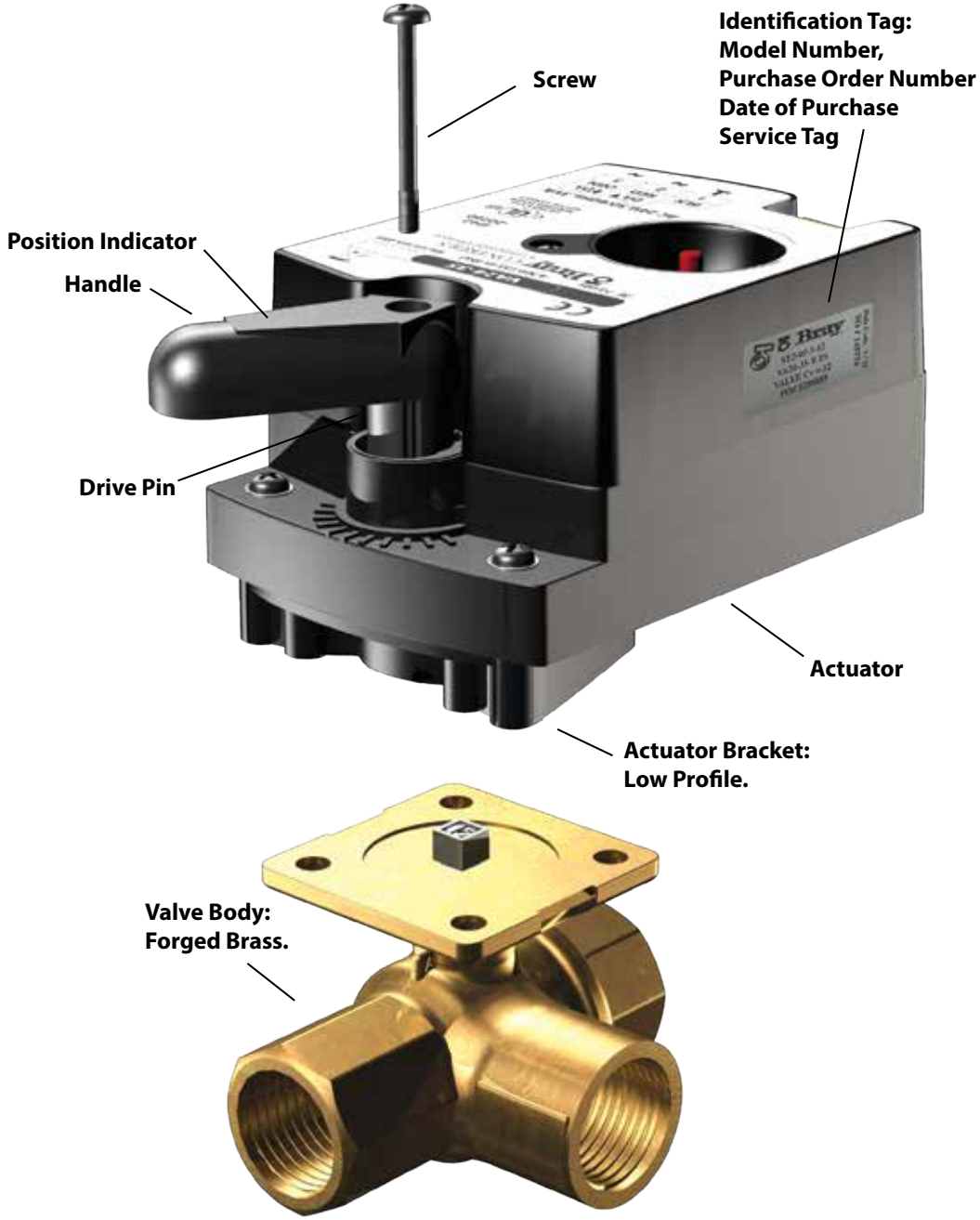
Note: Mount the valve downstream from the coil to minimize heat transfer to the actuator. For pure diverting applications (one inlet/two outlets), only the standard port (no characterization disc) versions will work.

3-Way - Default Configuration for ST2 Ball Valves

Valve Position at Actuator Position	3-Way Non Spring Return	3-Way Spring Return N.O	3-Way Spring Return N.C.
Valve Position w/ Act CCW	A open to C	A open to C	A open to C
Valve position w/Act CW	B open to C	B open to C	B open to C
Valve Position w power removed	Last Position	A open to C	B open to C
Proportional actuator control signal Action (Direct Acting)*	CCW at 0; CW at Max	CCW at 0, CW at Max	CW at 0, CCW at Max

**Proportional actuators include a switch to field convert from Direct Acting to Reverse Action*

SoftTouch 2 - Exploded View - Direct Mount Actuators



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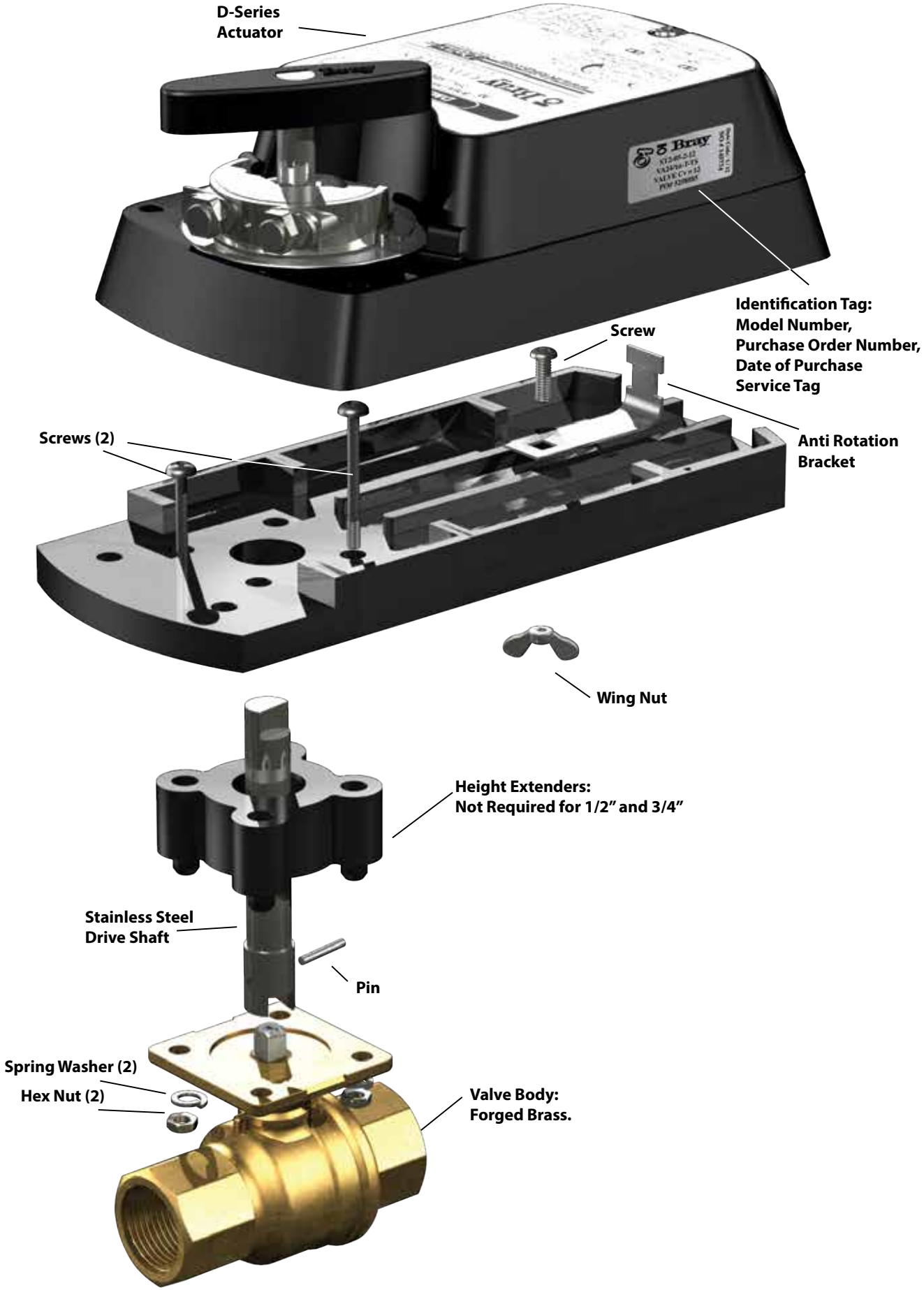
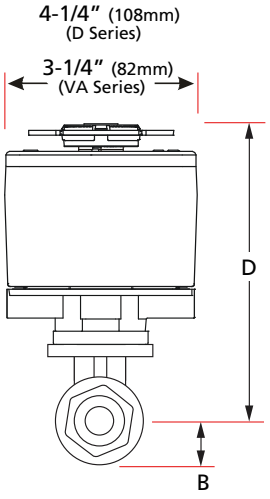
SoftTouch 2 - Exploded View - Universal Mount (D-Series) Actuators

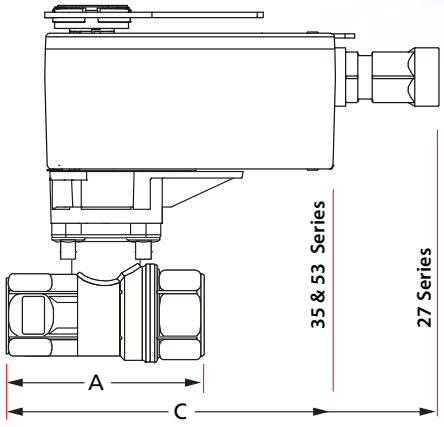


SoftTouch 2 - 2-Way Dimensions

VAS27, VA35 & D53-Series



Shown without Thermal Barrier



ST2 Dimensions - 2-Way - VAS27 Series

	ST2 VALVE MODEL # PREFIX ST2 Size-Way-Cv	Connection		Available Cv's	Please reference the illustration									
					A		B		C		D•		Weight	
		in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
Direct Mount	ST2-05-2-...	1/2	15	0.46, 0.73, 1.2, 1.9, 2.9, 4.7, 11.7*	2-1/2	64	5/8	17	6-31/32	177	4-5/8	117.3	0.8	.36
	ST2-75-2-...	3/4	20	4.7, 7.4, 11.7*	2-13/16	71	5/8	17	7-1/8	181	4-5/8	117.3	1.0	.45
	ST2-1-2-...	1	25	7.4, 11.7, 18.7*	3-7/16	87	3/4	19	7-31/64	190	4-11/16	119.0	1.8	.82
	ST2-125-2-...	1-1/4	32	11.7, 18.7, 29.2*	3-15/16	101	1	26	7-3/4	197	5-9/64	130.3	2.3	1.0
	ST2-150-2-...	1-1/2	40	18.7, 29.2, 46.8*	4-5/16	109	1-1/8	29	7-21/23	201	5-19/64	134.3	3.8	1.7
	ST2-2-2-...	2	50	29.2, 46.8, 73.7*	4-7/8	124	1-1/2	37	8-1/4	209	5-17/32	140.3	5.0	2.3

ST2 Dimensions - 2-Way - VA35 Series

	ST2 VALVE MODEL # PREFIX ST2 Size-Way-Cv	Connection		Available Cv's	Please reference the illustration									
					A		B		C		D•		Weight	
		in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
Direct Mount	ST2-05-2-...	1/2	15	0.46, 0.73, 1.2, 1.9, 2.9, 4.7, 11.7*	2-1/2	64	5/8	17	5-7/64	129	3-7/8	98	0.8	.36
	ST2-75-2-...	3/4	20	4.7, 7.4, 11.7*	2-13/16	71	5/8	17	5-7/32	133	3-7/8	98	1.0	.45
	ST2-1-2-...	1	25	7.4, 11.7, 18.7*	3-7/16	87	3/4	19	5-9/16	141	3-11/16	100	1.8	.82
	ST2-125-2-...	1-1/4	32	11.7, 18.7, 29.2*	3-15/16	101	1	26	5-13/16	148	4-3/8	111	2.3	1.0
	ST2-150-2-...	1-1/2	40	18.7, 29.2, 46.8*	4-5/16	109	1-1/8	29	6-1/2	152	4-9/17	115	3.8	1.7
	ST2-2-2-...	2	50	29.2, 46.8, 73.7*	4-7/8	124	1-1/2	37	6-1/3	160	4-3/4	121	5.0	2.3

ST2 Dimensions - 2-Way - D53 Series

	ST2 VALVE MODEL # PREFIX ST2 Size-Way-Cv	Connection		Available Cv's	Please reference the illustration									
					A		B		C		D•		Weight	
		in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	lb	kg
Universal Mount	ST2-125-2-...	1-1/4	32	11.7, 18.7, 29.2*	3-15/16	100	1	26	7-7/8	175	6-7/16	164	2.3	1.0
	ST2-150-2-...	1-1/2	40	18.7, 29.2, 46.8*	4-5/16	110	1-1/8	29	8-1/16	180	6-5/8	168	3.8	1.7
	ST2-2-2-...	2	50	29.2, 46.8, 73.7*	4-13/16	123	1-1/2	38	8-5/16	186	6-3/4	171	5.0	2.3

Dimensions may vary, depending on the actuator.
Weights shown are for valve bodies only.
** Reduced Port Valve - No characterizing disc.*

Dimensions are shown in inches and are approximate.
• Add 1-3/4" additional height for High Temp mounting kit. (-HT)
Allow 3-1/2" clearance for actuator removal.

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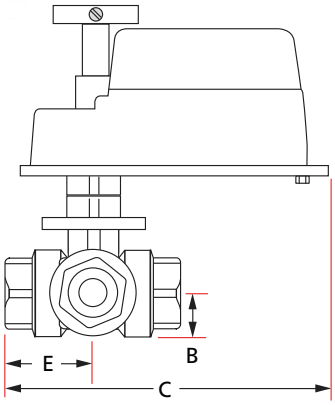
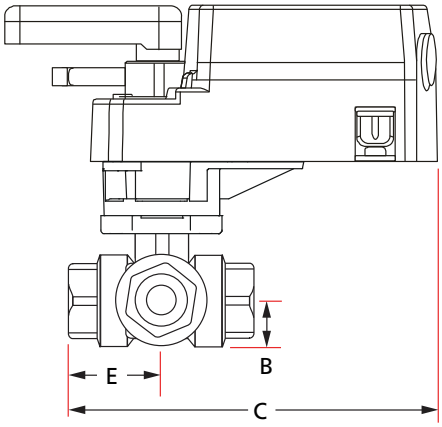
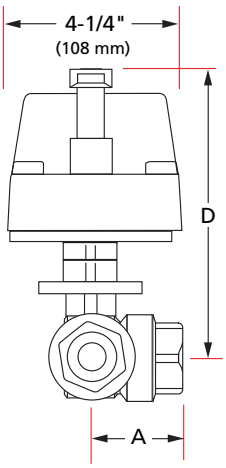
Universal Mount D-Series

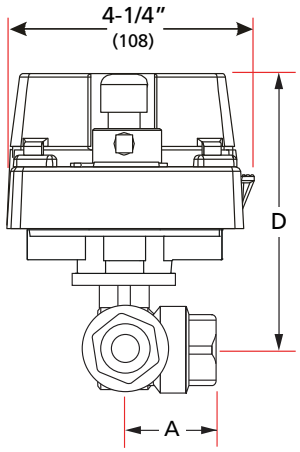


Direct Mount VA-Series



Shown without Thermal Barrier





ST2 Dimensions - 3-Way

	ST2 VALVE MODEL # PREFIX ST2 Size-Way-Cv	Connection		Available Cv's	Please reference the illustration											
					A		B		C		D•		E		Weight	
		in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	*lb*	*kg*
Direct Mount	ST2-05-3-...	1/2	15	1.2, 1.9, 2.9, 4.7, 11.7*	1-1/4	32	5/8	16	6-3/4	172	4-5/8	118	1-1/4	32	1.3	.57
	ST2-75-3-...	3/4	20	4.7, 7.4, 11.7*	1-13/32	36	5/8	16	6-15/16	176	4-5/8	118	1-3/8	36	1.5	.68
	ST2-1-3-...	1	25	7.4, 11.7, 18.7*	1-11/16	43	3/4	19	7-3/16	183	4-11/16	119	1-11/16	43	2.8	1.3
	ST2-125-3-...	1-1/4	32	11.7, 18.7, 29.2*	1-15/16	49	1	26	7-1/2	191	5-1/8	130	1-15/16	50	4.3	1.9
	ST2-150-3-...	1-1/2	40	18.7, 29.2, 46.8*	2-1/4	57	1-1/8	29	7-13/16	198	5-3/16	148	2-3/16	55	6.3	2.8
	ST2-2-3-...	2	50	29.2, 46.8, 73.7*	2-5/8	67	1-3/8	35	8-3/8	213	5-3/8	137	2-7/16	62	8.2	3.7
Universal Mount	ST2-125-3-...	1-1/4	32	11.7, 18.7, 29.2*	2	51	1	26	7-7/8	175	6-7/16	164	1-15/16	50	4.3	1.9
	ST2-150-3-...	1-1/2	40	18.7, 29.2, 46.8*	2-1/8	54	1-1/8	29	8-1/16	180	6-5/8	168	2-3/16	55	6.3	2.8
	ST2-2-3-...	2	50	29.2, 46.8, 73.7*	2-9/16	65	1-1/2	38	8-5/16	186	6-3/4	171	2-7/16	62	8.2	3.7

Dimensions may vary, depending on the actuator.
Weights shown are for valve bodies only.
Allow 3-1/2" clearance for actuator removal.
** Reduced Port Valve - No characterizing disc.*

Dimensions are shown in inches and are approximate.
• Add 1-3/4" additional height for High Temp mounting kit. (-HT)
Allow 3-1/2" clearance for actuator removal.
Dimensions are shown for the largest spring return actuator currently available.

SoftTouch 2 - Valve Sizing Steps

STEP ONE Determine the designed Cv by using the following equation.

$$Cv = \frac{Q\sqrt{G}}{\sqrt{\Delta P}}$$

Where

- **Q** = Flow in gallons per minute (GPM) required to pass through the valve
- **G** = Specific gravity of fluid *
- **ΔP** = Designed pressure drop across the valve in PSI
- **Cv** = Flow coefficient

NOTES

* Specific gravity is negligible (equal to 1) for water below 200˚F. Use actual specific gravity of pure fluids other than water. In most cases, the valve selected for a H_2O mixture will not be affected by the specific gravity.

EXAMPLE

The Specific Gravity of 50% Water (Compound 1) and 50% Ethylene Glycol Solution (Compound 2):

$$\frac{1}{\text{Specific Gravity}} = \frac{0.5}{1.0} + \frac{0.5}{1.113} = 1.05$$

$$\frac{1}{G_{soln}} = \frac{\text{wt\% of Compound 1}}{\text{Specific Gravity (G)}} + \frac{\text{wt\% of Compound 2}}{\text{Specific Gravity (G)}}$$

STEP TWO Determine whether the valve should be line size or sized to match the designed pressure drop (typical for modulating applications where precise control is required.)

OPTION 1

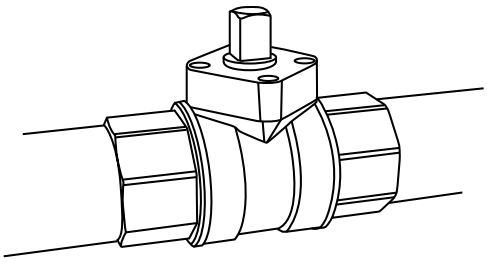
LINE SIZE

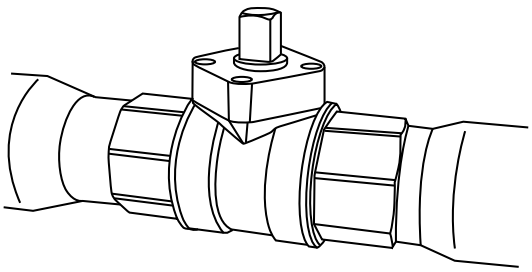
Go to page S2-9, ST2 Series Quick Reference Charts. Using the line size, find a valve of the same size with a Cv that best matches the one calculated in Step 1.

OPTION 2

SIZE FOR PRECISE CONTROL

Go to pages S2-10 (2-Way or 3-Way), ST2 Series Piping Geometry Charts. Find the line size at the top of the chart. Scan down the page to the Cv that best matches the one calculated in Step 1.





STEP THREE Determine the actual pressure drop using the below equation.

$$\Delta P = \left(\frac{Q\sqrt{G}}{Cv} \right)^2$$

If the pressure drop is acceptable†, go to Step 4.
If not, repeat Steps 2 and 3, selecting an alternate valve.

STEP FOUR Check to be sure that the close-off requirements are met. Refer to Page S2-11 - S2-14.

† Recommended to be no higher than 35 PSI or match the designed pressure drop, 3, 4, 5, and 6 PSI are commonly accepted for modulating applications.

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2-WAY - GPM - Quick Reference Sizing Chart

VALVE SIZE	MODEL NO.	Cv 1.0	DIFFERENTIAL PRESSURE (PSI) 1.5	2.0	2.5	3.0Δ	3.5Δ	4.0Δ	4.5Δ	5.0Δ	7.0	10.0
1/2″	ST2-05-2-005	0.46	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.2	1.5
	ST2-05-2-007	0.73	0.9	1.0	1.2	1.3	1.4	1.5	1.5	1.6	1.9	2.3
	ST2-05-2-01	1.2	1.5	1.7	1.9	2.1	2.2	2.4	2.5	2.7	3.2	3.8
	ST2-05-2-02	1.9	2.3	2.7	3.0	3.3	3.6	3.8	4.0	4.2	5.0	6.0
	ST2-05-2-03	2.9	3.6	4.1	4.6	5.0	5.4	5.8	6.2	6.5	7.7	9.2
	ST2-05-2-05	4.7	5.8	6.6	7.4	8.1	8.8	9.4	10.0	10.5	12.4	14.9
	ST2-05-2-12*	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
3/4″	ST2-75-2-05	4.7	5.8	6.6	7.4	8.1	8.8	9.4	10.0	10.5	12.4	14.9
	ST2-75-2-07	7.4	9.1	10.5	11.7	12.8	13.8	14.8	15.7	16.5	19.6	23.4
	ST2-75-2-12*	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
1″	ST2-1-2-07	7.4	9.1	10.5	11.7	12.8	13.8	14.8	15.7	16.5	19.6	23.4
	ST2-1-2-12	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
	ST2-1-2-19*	18.7	22.9	26.4	29.6	32.4	35.0	37.4	39.7	41.8	49.5	59.1
1-1/4″	ST2-125-2-12	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
	ST2-125-2-19	18.7	22.9	26.4	29.6	32.4	35.0	37.4	39.7	41.8	49.5	59.1
	ST2-125-2-29*	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
1-1/2″	ST2-150-2-19	18.7	22.9	26.4	29.6	32.4	35.0	37.4	39.7	41.8	49.5	59.1
	ST2-150-2-29	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
	ST2-150-2-47*	46.8	57.3	66.2	74.0	81.1	87.6	93.6	99.3	104.6	123.8	148.0
2″	ST2-2-2-29	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
	ST2-2-2-47	46.8	57.3	66.2	74.0	81.1	87.6	93.6	99.3	104.6	123.8	148.0
	ST2-2-2-74*	73.7	90.3	104.2	116.5	127.7	137.9	147.4	156.3	164.8	195.0	233.1

Cv is the gallons per minute of water that the valve will pass with 1 PSI pressure drop.
Δ 3-5 PSI is typically the preferred pressure drop in a modulating application.
* No characterization disc.

3-WAY - GPM - Quick Reference Sizing Chart

VALVE SIZE	MODEL NO.	Cv 1.0	DIFFERENTIAL PRESSURE (PSI) 1.5	2.0	2.5	3.0Δ	3.5Δ	4.0Δ	4.5Δ	5.0Δ	7.0	10.0
1/2″	ST2-05-3-01	1.2	1.5	1.7	1.9	2.1	2.2	2.4	2.5	2.7	3.2	3.8
	ST2-05-3-02	1.9	2.3	2.7	3.0	3.3	3.6	3.8	4.0	4.2	5.0	6.0
	ST2-05-3-03	2.9	3.6	4.1	4.6	5.0	5.4	5.8	6.2	6.5	7.7	9.2
	ST2-05-3-05	4.7	5.8	6.6	7.4	8.1	8.8	9.4	10.0	10.5	12.4	14.9
	ST2-05-3-12*	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
3/4″	ST2-75-3-05	4.7	5.8	6.6	7.4	8.1	8.8	9.4	10.0	10.5	12.4	14.9
	ST2-75-3-07	7.4	9.1	10.5	11.7	12.8	13.8	14.8	15.7	16.5	19.6	23.4
	ST2-75-3-12*	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
1″	ST2-1-3-07	7.4	9.1	10.5	11.7	12.8	13.8	14.8	15.7	16.5	19.6	23.4
	ST2-1-3-12	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
	ST2-1-3-19*	18.7	22.9	26.4	29.6	32.4	35.0	37.4	39.7	41.8	49.5	59.1
1-1/4″	ST2-125-3-12	11.7	14.3	16.5	18.5	20.3	21.9	23.4	24.8	26.2	31.0	37.0
	ST2-125-3-19	18.7	22.9	26.4	29.6	32.4	35.0	37.4	39.7	41.8	49.5	59.1
	ST2-125-3-29*	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
1-1/2″	ST2-150-3-19	18.7	22.9	26.4	29.6	32.4	35.0	37.4	39.7	41.8	49.5	59.1
	ST2-150-3-29	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
	ST2-150-3-47*	46.8	57.3	66.2	74.0	81.1	87.6	93.6	99.3	104.6	123.8	148.0
2″	ST2-2-3-29	29.2	35.8	41.3	46.2	50.6	54.6	58.4	61.9	65.3	77.3	92.3
	ST2-2-3-47	46.8	57.3	66.2	74.0	81.1	87.6	93.6	99.3	104.6	123.8	148.0
	ST2-2-3-74*	73.7	90.3	104.2	116.5	127.7	137.9	147.4	156.3	164.8	195.0	233.1

Cv is the gallons per minute of water that the valve will pass with 1 PSI pressure drop.
Δ 3-5 PSI is typically the preferred pressure drop in a modulating application.
* No characterization disc.

SoftTouch 2 - Adjusted Cv Charts for Piping Geometry Factor(Fp)

2-WAY - PIPING GEOMETRY CHART - Adjusted Cv

Valve Size	Valve Model Number	Nominal Cv	Pipe Size						
			3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
1/2"	ST2-05-2-005	0.46	.46	.46	---	---	---	---	---
	ST2-05-2-007	0.73	.73	.73	---	---	---	---	---
	ST2-05-2-01	1.2	1.2	1.2	---	---	---	---	---
	ST2-05-2-02	1.9	1.9	1.9	---	---	---	---	---
	ST2-05-2-03	2.9	2.8	2.8	---	---	---	---	---
	ST2-05-2-05	4.7	4.4	4.3	---	---	---	---	---
	ST2-05-2-12	11.7	8.8	7.6	---	---	---	---	---
3/4"	ST2-75-2-05	4.7	---	4.7	4.6	---	---	---	---
	ST2-75-2-07	7.4	---	7.3	7.1	---	---	---	---
	ST2-75-2-12	11.7	---	11.2	10.7	---	---	---	---
1"	ST2-1-2-07	7.4	---	---	7.4	7.3	---	---	---
	ST2-1-2-12	11.7	---	---	11.6	11.4	---	---	---
	ST2-1-2-19	18.7	---	---	18.2	17.7	---	---	---
1-1/4"	ST2-125-2-12	11.7	---	---	---	11.7	11.6	---	---
	ST2-125-2-19	18.7	---	---	---	18.6	18.2	---	---
	ST2-125-2-29	29.2	---	---	---	28.7	27.3	---	---
1-1/2"	ST2-150-2-19	18.7	---	---	---	---	18.6	18.4	---
	ST2-150-2-29	29.2	---	---	---	---	28.7	28.1	---
	ST2-150-2-47	46.8	---	---	---	---	44.8	42.8	---
2"	ST2-2-2-29	29.2	---	---	---	---	---	29.1	28.9
	ST2-2-2-47	46.8	---	---	---	---	---	46.3	45.7
	ST2-2-2-74	73.7	---	---	---	---	---	72.0	69.7

EXAMPLE *What is the correct Cv rating for a (1") ST2-1-2-19 valve when placed on a 1-1/2" pipe?*
First go to the 1-1/2" pipe column and follow this down until you reach the ST2-1-2-19 row
The value where they meet is the corrected Cv rating, which is 17.7.

SoftTouch 2 - Adjusted Cv Charts for Piping Geometry Factor(Fp)

3-WAY - PIPING GEOMETRY CHART - Adjusted Cv

Valve Size	Valve Model Number	Nominal Cv	Pipe Size						
			3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
1/2"	ST2-05-3-01	1.2	1.2	1.2	---	---	---	---	---
	ST2-05-3-02	1.9	1.9	1.9	---	---	---	---	---
	ST2-05-3-03	2.9	2.8	2.8	---	---	---	---	---
	ST2-05-3-05	4.7	4.4	4.3	---	---	---	---	---
	ST2-05-3-12	11.7	8.8	7.6	---	---	---	---	---
3/4"	ST2-75-3-05	4.7	---	4.7	4.6	---	---	---	---
	ST2-75-3-07	7.4	---	7.3	7.1	---	---	---	---
	ST2-75-3-12	11.7	---	11.2	10.7	---	---	---	---
1"	ST2-1-3-07	7.4	---	---	7.4	7.3	---	---	---
	ST2-1-3-12	11.7	---	---	11.6	11.4	---	---	---
	ST2-1-3-19	18.7	---	---	18.2	17.7	---	---	---
1-1/4"	ST2-125-3-12	11.7	---	---	---	11.7	11.6	---	---
	ST2-125-3-19	18.7	---	---	---	18.6	18.2	---	---
	ST2-125-3-29	29.2	---	---	---	28.7	27.3	---	---
1-1/2"	ST2-150-3-19	18.7	---	---	---	---	18.6	18.4	---
	ST2-150-3-29	29.2	---	---	---	---	28.7	28.1	---
	ST2-150-3-47	46.8	---	---	---	---	44.8	42.8	---
2"	ST2-2-3-29	29.2	---	---	---	---	---	29.1	28.9
	ST2-2-3-47	46.8	---	---	---	---	---	46.3	45.7
	ST2- 2-3-74	73.7	---	---	---	---	---	72.0	69.7

EXAMPLE *What is the correct Cv rating for a (1-1/2") ST2-125-3-19 valve when placed on a 2" pipe?*
First go to the 2" pipe column and follow this down until you reach the ST2-125-3-19 row
The value where they meet is the corrected Cv rating, which is 18.6.

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SoftTouch 2 - 2-Way - Non Spring Return Close-Off Chart (PSI)

2-WAY - Non Spring Return - Close-Off Chart (PSI)

Actuators				24 VAC On/Off or Floating			Modulating	
Control Input	2-wire On/Off			■•	■	■		
	3-wire On/Off or Floating			■	■	■		
	3wire On/Off or Floating with Time Out				■			
	Proportional with Feedback						■	■
Auxiliary Switches						■		■
Wiring Connections	Enclosed Terminal Strip					■		■
	Conduit Size - Flex(F)/NPT(N)			3/8 F	3/8 F	1/2 N	3/8	1/2 N
	Plenum Rated Leads			■	■		■	
	Direct Mount			■	■		■	
Actuator Model No.				VA24-35-P	VA24-35-PTO	D24-70-A	VAM24-35-P	DM24-70-A
SIZE NPT	Flow Coefficient Cv	Flow Coefficient Kv	MODEL #					
1/2″	0.46	0.4	ST2-05-2-005	200	200		200	
	0.73	0.6	ST2-05-2-007	200	200		200	
	1.2	1.0	ST2-05-2-01	200	200		200	
	1.9	1.6	ST2-05-2-02	200	200		200	
	2.9	2.5	ST2-05-2-03	200	200		200	
	4.7	4.1	ST2-05-2-05	200	200		200	
	11.7*	10.1	ST2-05-2-12	200	200		200	
3/4″	4.7	4.1	ST2-75-2-05	200	200		200	
	7.4	6.4	ST2-75-2-07	200	200		200	
	11.7*	10.1	ST2-75-2-12	200	200		200	
1″	7.4	6.4	ST2-1-2-07	200	200		200	
	11.7	10.1	ST2-1-2-12	200	200		200	
	18.7*	16.2	ST2-1-2-19	200	200		200	
1-1/4″	11.7	10.1	ST2-125-2-12	200	200	200	200	200
	18.7	16.2	ST2-125-2-19	200	200	200	200	200
	29.2*	25.3	ST2-125-2-29	200	200	200	200	200
1-1/2″	18.7	16.2	ST2-150-2-19	200	200	200	200	200
	29.2	25.3	ST2-150-2-29	200	200	200	200	200
	46.8*	40.5	ST2-150-2-47	200	200	200	200	200
2″	29.2	25.3	ST2-2-2-29	200	200	200	200	200
	46.8	40.5	ST2-2-2-47	200	200	200	200	200
	73.7*	63.8	ST2-2-2-74	200	200	200	200	200

Refer to the Actuator Section for a list of actuators with additional options (i.e. auxiliary switches etc.)
Add "HT" to the end of the valve body part number for the High Temperature mounting option. (VA series only)
** Reduced Port Valve - No characterizing disc.*
• Relay Required

Key ST2-05-2-01 = ST2 SoftTouch Valve Series; 05 Size (in.); 2 Configuration (2 = 2 Way, 3 = 3 Way); 01 Cv

2-WAY - Spring Return - Close-Off Chart (PSI)

Actuators		120 VAC On/Off	24 VAC On/Off	24 VAC Floating	Modulating
Control Input	2-wire On/Off	■	■	■	
	3-wire or Floating			■	
	Proportional with Feedback				■
Optional Auxiliary Switches Available		■	■	■	■
Wiring Connections	NPT Conduit Fitting	1/2	1/2	1/2	1/2
	Plenum Rated Leads			■	■

Actuator Model No.				VASU20-27	VAS24-27	VAS24-27-T	VAMS24-27
SIZE NPT	Flow Coefficient Cv	Kv	MODEL #				
1/2″	0.46	0.4	ST2-05-2-005_	200	200	200	200
	0.73	0.6	ST2-05-2-007_	200	200	200	200
	1.2	1.0	ST2-05-2-01_	200	200	200	200
	1.9	1.6	ST2-05-2-02_	200	200	200	200
	2.9	2.5	ST2-05-2-03_	200	200	200	200
	4.7	4.1	ST2-05-2-05_	200	200	200	200
	11.7*	10.1	ST2-05-2-12_	200	200	200	200
3/4″	4.7	4.1	ST2-75-2-05_	200	200	200	200
	7.4	6.4	ST2-75-2-07_	200	200	200	200
	11.7*	10.1	ST2-75-2-12_	200	200	200	200
1″	7.4	6.4	ST2-1-2-07_	200	200	200	200
	11.7	10.1	ST2-1-2-12_	200	200	200	200
	18.7*	16.2	ST2-1-2-19_	200	200	200	200
1-1/4″	11.7	10.1	ST2-125-2-12_	200	200	200	200
	18.7	16.2	ST2-125-2-19_	200	200	200	200
	29.2*	25.3	ST2-125-2-29_	200	200	200	200
1-1/2″	18.7	16.2	ST2-150-2-19_	200	200	200	200
	29.2	25.3	ST2-150-2-29_	200	200	200	200
	46.8*	40.5	ST2-150-2-47_	200	200	200	200
2″	29.2	25.3	ST2-2-2-29_	200	200	200	200
	46.8	40.5	ST2-2-2-47_	200	200	200	200
	73.7*	63.8	ST2-2-2-74_	200	200	200	200

C= Normally Closed, otherwise Normally Open

Refer to the Actuator Section for a list of actuators with additional options (i.e. auxiliary switches etc.)

Add "HT" to the end of the valve body part number for the High Temperature mounting option. (VAS series only)

** Reduced Port Valve - No characterizing disc.*

• Relay Required

Key ST2-05-2-01 =

ST2	05	2	01	C
SoftTouch Valve Series	Size (in.)	Configuration 2 = 2 Way 3 = 3 Way	Cv	C=Closed otherwise no indicator shown

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3-WAY - Non Spring Return - Close-Off Chart (PSI)

Actuators		24 VAC Floating			Modulating	
Control Input	2-wire On/Off	■•	■	■		
	3-wire On/Off or Floating	■	■	■		■
	3-wire on/off or Floating with Time Out					■
	Proportional with Feedback				■	■
Optional Auxiliary Switches Available				■		
Wiring Connections	Enclosed Terminal Strip			■		
	Conduit Size - Flex(F)/NPT(N)	3/8 F	3/8 F	1/2 N	3/8 F	1/2 N
	Plenum Rated Leads	■	■		■	■
	Direct Mount	■	■		■	■

Actuator Model No.				VA24-35-P	VA24-35-PTO	D24-70	VAM24-35-P	VAM24-90-PTO
SIZE NPT	Flow Coefficient Cv	Flow Coefficient Kv	MODEL #					
1/2″	1.2 (0.7)	1.0 (0.6)	ST2-05-3-01	200	200		200	
	1.9 (1.2)	1.6 (1.0)	ST2-05-3-02	200	200		200	
	2.9 (1.9)	2.5 (1.6)	ST2-05-3-03	200	200		200	
	4.7 (2.9)	4.0 (2.5)	ST2-05-3-05	200	200		200	
	11.7* (5.8)	10.0 (5.0)	ST2-05-3-12	200	200		200	
3/4″	4.7 (2.9)	4.0 (2.5)	ST2-75-3-05	200	200		200	
	7.4 (4.7)	6.3 (4.0)	ST2-75-3-07	200	200		200	
	11.7* (5.8)	10.0 (5.0)	ST2-75-3-12	200	200		200	
1″	7.4 (4.7)	6.3 (4.0)	ST2-1-3-07	200	200		200	
	11.7 (7.4)	10.0 (6.3)	ST2-1-3-12	200	200		200	
	18.7* (9.4)	16.0 (8.0)	ST2-1-3-19	200	200		200	
1-1/4″	11.7 (7.4)	10.0 (6.3)	ST2-125-3-12					200
	18.7 (11.7)	16.0 (10.0)	ST2-125-3-19					200
	29.2* (14.6)	25.0 (12.5)	ST2-125-3-29					200
1-1/2″	18.7 (11.7)	16.0 (10.0)	ST2-150-3-19					200
	29.2 (18.7)	25.0 (16.0)	ST2-150-3-29					200
	46.8* (23.4)	40.0 (20.0)	ST2-150-3-47					200
2″	29.2 (18.7)	25.0 (16.0)	ST2-2-3-29			200		200
	46.8 (29.2)	40.0 (25.0)	ST2-2-3-47			200		200
	73.7* (36.8)	63.0 (31.5)	ST2-2-3-74			200		200

Refer to the Actuator Section for a list of actuators with additional options (i.e. auxiliary switches etc.)
Add "HT" to the end of the valve body part number for the High Temperature mounting option. (VA series only)
Bypass Port Cv has a characterizing disk.
** Reduced Port Valve - No characterizing disc.*
• Relay Required
( ) Bypass Port Cv & Kv data (3-Way only)

Key
ST2-1-3-12 = ST2 SoftTouch Valve Series; 1 Size (in.); 3 Configuration 2 = 2 Way 3 = 3 Way; 12 Cv

SoftTouch 2 - 3-Way - Spring Return Close-Off Chart (PSI)

3-WAY - Spring Return - Close-Off Chart (PSI)

Actuators		120 On/Off		24 VAC On/Off		24 VAC Floating		Modulating	
Control Input	2-wire On/Off	■	■	■	■	■	■		
	3-wire or Floating					■	■		
	Proportional with Feedback							■	■
Optional Auxiliary Switches Available		■	■	■	■	■	■	■	■
Wiring Connections	Conduit Size - Flex(F)/NPT(N)	1/2 N	3/8 F	1/2 N	3/8 F	1/2 N	3/8 F	1/2 N	3/8 F
	Plenum Rated Leads					■		■	

Actuator Model No.				VASU20 -27	VAS120 -70	VAS24 -27	VAS24 -70	VAS24 -27-T	VAS24 -70-T	VAMS24 -27	VAMS24 -70
SIZE NPT	Flow Coefficient Cv	Kv	MODEL #								
1/2″	1.2 (0.7)	1.0 (0.6)	ST2-05-3-01_	200		200		200		200	
	1.9 (1.2)	1.6 (1.0)	ST2-05-3-02_	200		200		200		200	
	2.9 (1.9)	2.5 (1.6)	ST2-05-3-03_	200		200		200		200	
	4.7 (2.9)	4.0 (2.5)	ST2-05-3-05_	200		200		200		200	
	11.7* (5.8)	10.0 (5.0)	ST2-05-3-12_	200		200		200		200	
3/4″	4.7 (2.9)	4.0 (2.5)	ST2-75-3-05_	200		200		200		200	
	7.4 (4.7)	6.3 (4.0)	ST2-75-3-07_	200		200		200		200	
	11.7* (5.8)	10.0 (5.0)	ST2-75-3-12_	200		200		200		200	
1″	7.4 (4.7)	6.3 (4.0)	ST2-1-3-07_	200		200		200		200	
	11.7 (7.4)	10.0 (6.3)	ST2-1-3-12_	200		200		200		200	
	18.7* (9.4)	16.0 (8.0)	ST2-1-3-19_	200		200		200		200	
1-1/4″	11.7 (7.4)	10.0 (6.3)	ST2-125-3-12_		200		200		200		200
	18.7 (11.7)	16.0 (10.0)	ST2-125-3-19_		200		200		200		200
	29.2* (14.6)	25.0 (12.5)	ST2-125-3-29_		200		200		200		200
1-1/2″	18.7 (11.7)	16.0 (10.0)	ST2-150-3-19_		200		200		200		200
	29.2 (18.7)	25.0 (16.0)	ST2-150-3-29_		200		200		200		200
	46.8* (23.4)	40.0 (20.0)	ST2-150-3-47_		200		200		200		200
2″	29.2 (18.7)	25.0 (16.0)	ST2-2-3-29_		200		200		200		200
	46.8 (29.2)	40.0 (25.0)	ST2-2-3-47_		200		200		200		200
	73.7* (36.8)	63.0 (31.5)	ST2-2-3-74_		200		200		200		200

C= Normally Closed, otherwise Normally Open

Refer to the Actuator Section for a list of actuators with additional options (i.e. auxiliary switches etc.)
Add "HT" to the end of the valve body part number for the High Temperature mounting option. (VAS series only)
Bypass Port Cv has a characterizing disk.
** Reduced Port Valve - No characterizing disc.*
• Relay Required
( ) Bypass Port Cv & Kv data (3-Way only)

Key
ST2-05-3-01 = ST2 (SoftTouch Valve Series) 05 (Size (in.)) 3 (Configuration 2 = 2 Way 3 = 3 Way) 01 (Cv) C (C=Closed otherwise no indicator shown)

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The Benefits of Ball Valves in Commercial Applications

Ball valves are generally a superior alternative to globe valves where precise control is required. Ball valves tend to offer higher close-offs and rangeability ratios while providing smaller size, weights and costs. Ball valves also offer more Cv options in order to more closely match your specifications.

Bray offers two distinct lines that come in both threaded and flanged sizes. These characterized ball valves provide superior control characteristics, low torque requirements years of trouble free service and multiple actuator options.

NPT Threaded Comparative Specifications

	ST2 Series	BV Series
Valve Body Pressure Rating	580 PSI	1000 PSI
Max Water Temperature	284˚F @ 36 PSI	225˚F @ 1000 PSI
Steam	15 PSIG	150 PSIG
Max Recommended Operating Pressure Drop	50 PSI	80 PSI
Leakage	0.01%	Bubble Tight

Disclaimer - *The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.*

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