Bray COMMERCIAL

STM Series

Flanged Characterized Ball Valves

2-Way and 3-Way • 2-1/2"- 4"

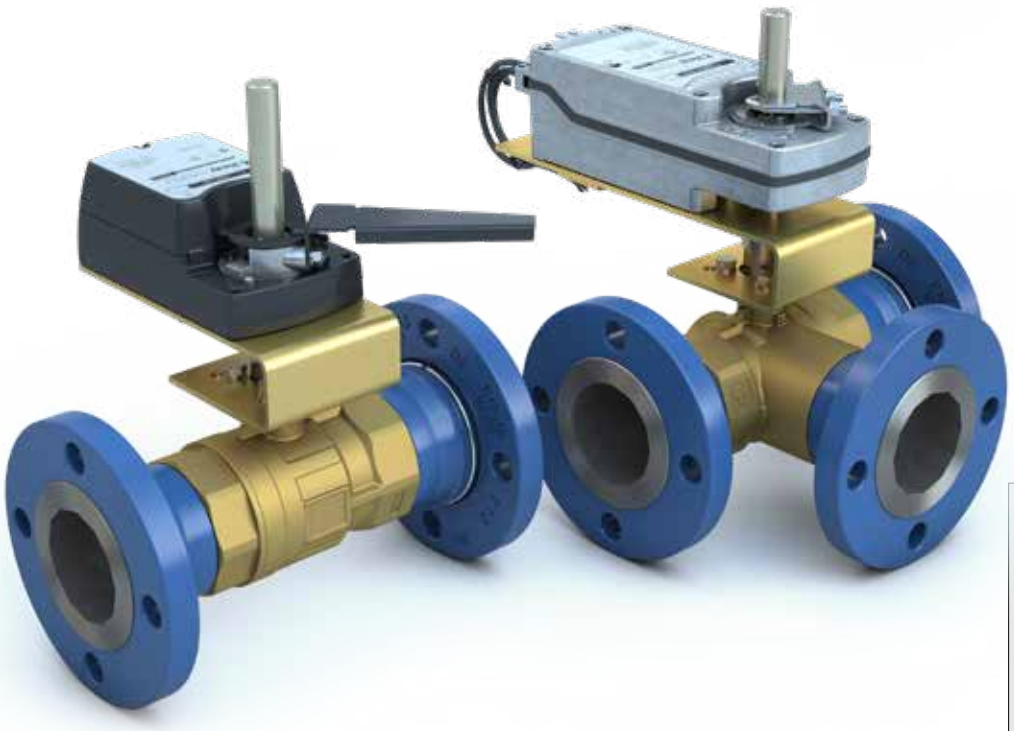
CONTENTS

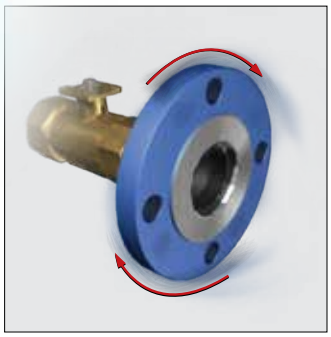
DOCUMENT

08/23/21

STM Series Flanged Ball Valves are designed to regulate the flow of hot water, chilled water, and 50% glycol solutions to the demand of a controller in Heating, Ventilating, and Air Conditioning (HVAC) systems. The valves come in sizes of 2-1/2", 3", and 4". The (ANSI) Class 125/150 flanged valves come in both 2-way and 3-way configurations and are available in multiple Cv ratings. Bray offers the valve, linkage, and actuator assemblies for factory or field mounting with either spring return or non-spring return actuators.

The STM is designed for electronic actuator operation to a maximum close-off pressure of 100 psi and for temperature ranges 0˚ to 284˚F.





Free Spinning Lap Flange

Features and Benefits

- **Lap Flange**
  Allows easy positioning and alignment with mating flanges
- **Low Torque**
  Smaller actuator and longer life
- **Dimensionally Stable at High Temperatures**
  Works in low pressure steam applications
- **5 Year Warranty**
  Assurance of trouble free operation

5 Year Warranty

STM - Specifications

Technical Specifications

Service		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 25 psig (172 kPa) Saturated Steam for HVAC Systems
Valve Fluid Temperature Limits		0 to 284°F (-18 to 140°C)
Valve Body Pressure/ Temperature Rating	**Water**	ANSI Class 125/150 250 psi at -20 to 100°F (29 to 38°C) 235psi at: 200°F (93°C) 218psi at: 284°F (140°C)
	Steam	25 psig (172 kPa) Saturated Steam for HVAC Systems
Maximum Close-Off Pressure	**Two-Way**	100 psi (689 kPa)
	Three-Way	50 psi (345 kPa)
Maximum Recommended Operating Pressure Drop		30 psi (207 kPa) for quiet service
Flow Characteristics	**Two-Way**	Equal Percentage
	Three-Way	Equal Percentage Flow Characteristics of In-line Port or Linear Percentage Flow Characteristics of Angle Port
Rangeability		Greater than 500:1
Leakage	**Two/Three-Way**	0.01% of Maximum Flow, Control Port, ANSI/FCI 70-2, Class 4
	Three-Way	1% of Maximum Flow, Bypass Port
End Connections		ANSI Class 125 Flange
Minimum Ambient Operating Temperature	**-4°F (-20°C)**	D24-210/DC24-310 Series Non-Spring Return Actuators
	-40°F (-40°C)	DS-180 Series Spring Return Actuators
Maximum Ambient Operating Temperature	**122°F (50°C)**	D24-210/DC24-310 Series Non-Spring Return Actuators
	131°F (55°C)	DS-180 Series Spring Return Actuators
Materials	**Body**	Brass
	Flanges	Ductile Iron
	Ball	300 Series Stainless Steel
	Stem	300 Series Stainless Steel
	Seats	Graphite Reinforced PTFE with EPDM O-Ring Backing
	Stem Seals	EPDM O-Rings
	Flow Control Disk	Amodel AS-1145HS Polyphthalamide Resin
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 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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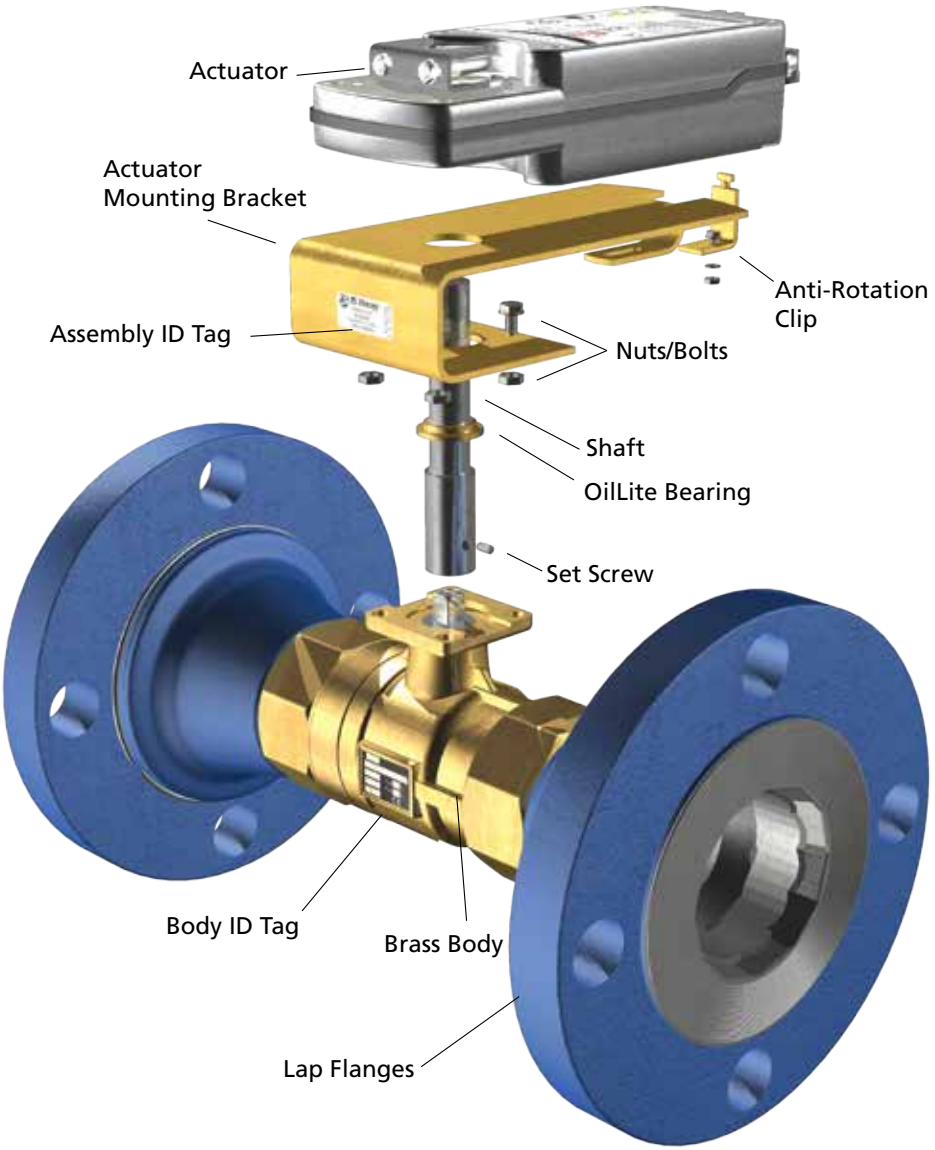
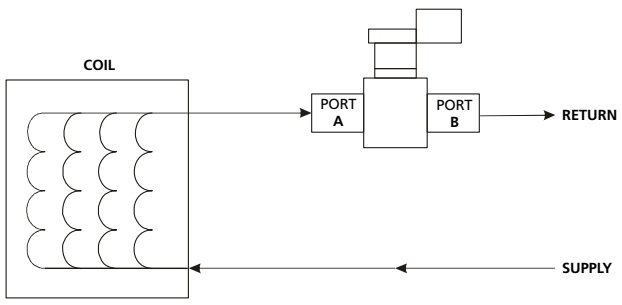
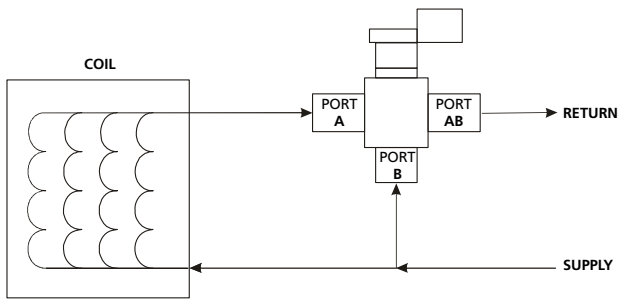
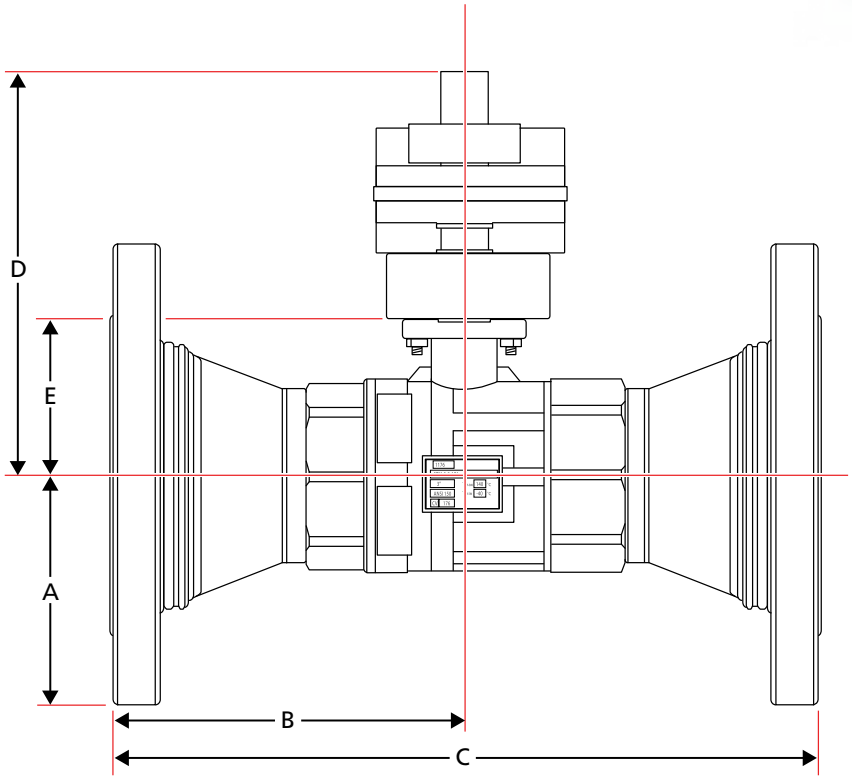
STM - 2-Way Exploded View



STM - Piping Diagrams

2-Way	3-Way
	

STM - 2-Way Dimensions



2-Way STM Dimensions

Valve Models	Size in.(mm)	Flow Coefficient Cv	Flow Coefficient Kv	Bolt Hole Diameter	Number of Bolt Holes	A	B	C	D	E	Weight lbs.	Weight kg.
STM 250-2-47	2 1/2 (65)	47	40.7	5.50 (139)	4	3.50 (89)	5.71 (145)	11.42 (290)	10.25 (260)	2.05 (52.1)	34	15
STM 250-2-74		74	64.0									
STM 250-2-117		117	101.2									
STM 3-2-74	3 (80)	74	64.0	6.00 (152)	4	3.75 (95)	6.10 (155)	12.20 (310)	10.25 (260)	2.49 (63.2)	36	16
STM 3-2-117		117	101.2									
STM 3-2-176		176	152.2									
STM 3-2-211*		211	182.5									
STM 4-2-117	4 (100)	117	101.2	7.50 (191)	8	4.50 (114)	6.89 (175)	13.77 (350)	10.25 (260)	3.09 (75.5)	44	20
STM 4-2-176*		176	152.2									

- Allow a minimum of 4 inches for actuator removal.
- Weights are for valve bodies only.
- Dimensions may vary depending on the actuator
- Dimensions Shown are based on largest actuator available for this series.
** Reduced Port Valve - No characterizing disc.*

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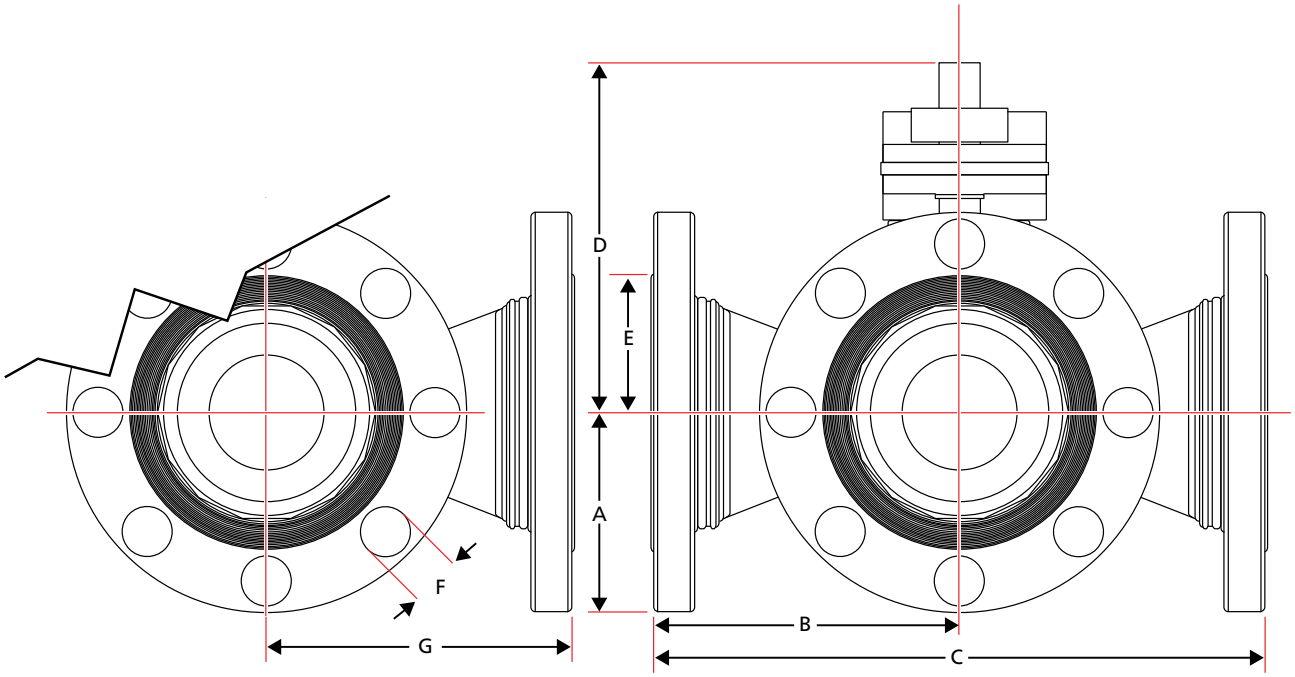
STM - 3-Way Dimensions



3-Way STM Dimensions

Valve Models	Size in.(mm)	Flow Coefficient Cv	Flow Coefficient Kv	Bolt Hole Diameter	Number of Bolt Holes	A	B	C	D	E	F	G	Weight lbs.	Weight kg.
STM 250-3-47	2 1/2 (65)	47	40.7	5.50 (139)	4	3.50 (89)	5.71 (145)	11.42 (290)	10.25 (260)	2.05 (52.1)	0.75 (19.1)	5.87 (149)	43	20
STM 250-3-74		74	64.0											
STM 250-3-117		117	101.2											
STM 3-3-74	3 (80)	74	64.0	6.00 (152)	4	3.75 (95)	6.10 (155)	12.20 (310)	10.25 (260)	2.49 (63.2)	0.75 (19.1)	6.26 (159)	49	22
STM 3-3-117		117	101.2											
STM 3-3-176		176	152.2											
STM 3-3-211*		211	182.5											
STM 4-3-117	4 (100)	117	101.2	7.50 (191)	8	4.50 (114)	6.89 (175)	13.77 (350)	10.25 (260)	3.09 (75.5)	0.75 (19.1)	7.05 (179)	62	28
STM 4-3-176*		176	152.2											

- Allow a minimum of 4 inches for actuator removal.
- Weights are for valve bodies only.
- Dimensions may vary depending on the actuator
- Dimensions Shown are based on largest actuator available for this series.
- Bypass Cv/Kv is 50% of the nominal service Cv.
** Reduced Port Valve - No characterizing disc.*

STM - 2-Way Actuator Selection and Close-Off Charts

2-Way STM Actuator Selection/Close-Off (PSI)

Non-Spring Return Actuator Models					24 VAC On/Off or Floating		24 VAC Modulating	
Control Input	3-Wire On/Off or Floating				■	■		
	Modulating with Feedback						■	■
	Optional Auxiliary Switches				■	■	■	■
Wiring Connections	Enclosed Terminal Strip				■		■	
	Conduit Size - Flex(F)/NPT(N)				*1/2 N*	*3/8 F*	*1/2 N*	*3/8 F*
	Cable - Standard(S)/Plenum(P)				*S*	*S*	*S*	*S*
Valve Models	Size in.	Size mm	Flow Coefficient Cv	Flow Coefficient Kv	**D24-210**	**DC24-310-T**	**DM24-210**	**DCM24-310**
STM 250-2-47	2 1/2	65	47	40.7	**100**	**100**	**100**	**100**
STM 250-2-74			74	64.0				
STM 250-2-117			117	101.2				
STM 3-2-74	3	80	74	64.0	**100**	**100**	**100**	**100**
STM 3-2-117			117	101.2				
STM 3-2-176			176	152.2				
STM 3-2-211•			211	182.5				
STM 4-2-117	4	100	117	101.2	**100**	**100**	**100**	**100**
STM 4-2-176•			176	152.2				

- For optional auxiliary switches, add -A to the end of the actuator part number.
- • Reduced Port Valve - No characterizing disc.

2-Way STM Actuator Selection/Close-Off (PSI)

Spring Return Actuator Models					24 VAC On/Off or Floating	120 VAC On/Off	24 VAC Modulating
Control Input	3-Wire On/Off or Floating				■	■	
	Modulating with Feedback						■
	Optional Auxiliary Switches				■	■	■
Wiring Connections	Conduit Size - Flex(F)/NPT(N)				*3/8 F*	*3/8 F*	*3/8 F*
	Cable - Standard(S)/Plenum(P)				*S*	*S*	*S*
Valve Models	Size in.	Size mm	Flow Coefficient Cv	Flow Coefficient Kv	**DS24-180-T**	**DS120-180**	**DMS24-180**
STM 250-2-47	2 1/2	65	47	40.7	**100**	**100**	**100**
STM 250-2-74			74	64.0			
STM 250-2-117			117	101.2			
STM 3-2-74	3	80	74	64.0	**100**	**100**	**100**
STM 3-2-117			117	101.2			
STM 3-2-176			176	152.2			
STM 3-2-211•			211	182.5			
STM 4-2-117	4	100	117	101.2	**100**	**100**	**100**
STM 4-2-176•			176	152.2			

- For optional auxiliary switches, add -A to the end of the actuator part number.
- • Reduced Port Valve - No characterizing disc.

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3-Way STM Actuator Selection/Close-Off (PSI)

Non-Spring Return Actuator Models					24 VAC On/Off or Floating		24 VAC Modulating	
Control Input	3-Wire On/Off or Floating				■	■		
	Modulating with Feedback						■	■
	Optional Auxiliary Switches				■	■	■	■
Wiring Connections	Enclosed Terminal Strip				■		■	
	Conduit Size - Flex(F)/NPT(N)				*1/2 N*	*3/8 F*	*1/2 N*	*3/8 F*
	Cable - Standard(S)/Plenum(P)				*S*	*S*	*S*	*S*
Valve Models	Size in.	Size mm	Flow Coefficient Cv*	Flow Coefficient Kv	**D24-210**	**DC24-310-T**	**DM24-210**	**DCM24-310**
STM 250-3-47	2 1/2	65	47	40.7	**50**	**50**	**50**	**50**
STM 250-3-74			74	64.0				
STM 250-3-117			117	101.2				
STM 3-3-74	3	80	74	64.0	**50**	**50**	**50**	**50**
STM 3-3-117			117	101.2				
STM 3-3-176			176	152.2				
STM 3-3-211•			211	182.5				
STM 4-3-117	4	100	117	101.2	**50**	**50**	**50**	**50**
STM 4-3-176•			176	152.2				

- For optional auxiliary switches, add -A to the end of the actuator part number.
- • Reduced Port Valve - No characterizing disc.
*- * Bypass Cv/Kv is 50% of the nominal service Cv.*

3-Way STM Actuator Selection/Close-Off (PSI)

Spring Return Actuator Models					24 VAC On/Off or Floating	120 VAC On/Off	24 VAC Modulating
Control Input	3-Wire On/Off or Floating				■	■	
	Modulating with Feedback						■
	Optional Auxiliary Switches				■	■	■
Wiring Connections	Conduit Size - Flex(F)/NPT(N)				*3/8 F*	*3/8 F*	*3/8 F*
	Cable - Standard(S)/Plenum(P)				*S*	*S*	*S*
Valve Models	Size in.	Size mm	Flow Coefficient Cv*	Flow Coefficient Kv	**DS24-180-T**	**DS120-180**	**DMS24-180**
STM 250-3-47	2 1/2	65	47	40.7	**50**	**50**	**50**
STM 250-3-74			74	64.0			
STM 250-3-117			117	101.2			
STM 3-3-74	3	80	74	64.0	**50**	**50**	**50**
STM 3-3-117			117	101.2			
STM 3-3-176			176	152.2			
STM 3-3-211•			211	182.5			
STM 4-3-117	4	100	117	101.2	**50**	**50**	**50**
STM 4-3-176•			176	152.2			

- For optional auxiliary switches, add -A to the end of the actuator part number.
- • Reduced Port Valve - No characterizing disc.
*- * Bypass Cv/Kv is 50% of the nominal service Cv.*

STM - Cv Pipe Size Correction Tables

2-Way STM Piping Geometry Chart (Adjusted Cv)

Valve Models	Valve Size		Flow Coefficient		Pipe Size			
	in.	mm	Cv	Kv	3"	4"	5"	6"
STM 250-2-47	2 1/2	65	47	40.7	47	47		
STM 250-2-74			74	64.0	74	72		
STM 250-2-117			117	101.2	115	109		
STM 3-2-74	3	80	74	64.0		74	73	
STM 3-2-117			117	101.2		115	113	
STM 3-2-176			176	152.2		169	162	
STM 3-2-211•			211	182.5		200	189	
STM 4-2-117	4	100	117	101.2			117	116
STM 4-2-176•			176	152.2			175	172

- • Reduced Port Valve - No characterizing disc.

3-Way STM Piping Geometry Chart (Adjusted Cv)

Valve Models	Valve Size		Flow Coefficient		Pipe Size			
	in.	mm	Cv	Kv	3"	4"	5"	6"
STM 250-3-47	2 1/2	65	47	40.7	47	47		
STM 250-3-74			74	64.0	74	72		
STM 250-3-117			117	101.2	115	109		
STM 3-3-74	3	80	74	64.0		74	73	
STM 3-3-117			117	101.2		115	113	
STM 3-3-176			176	152.2		169	162	
STM 3-3-211•			211	182.5		200	189	
STM 4-3-117	4	100	117	101.2			117	116
STM 4-3-176•			176	152.2			175	172

- • Reduced Port Valve - No characterizing disc.

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