

STM-Series Install Instructions - Flanged Characterized Ball Valves

Applications

The STM Series Flanged Ball Valves are designed to regulate hot and chilled water, 50/50 glycol solutions, and 25 psig steam in Heating, Ventilating, and Air Conditioning (HVAC) systems.

IMPORTANT: The STM Series Flanged Ball Valves are intended to control saturated steam, hot water, and chilled water flow under normal equipment operating conditions. Where failure or malfunction of the valve could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the valve.

Installation

Install the STM Series Flanged Ball Valves with the actuator at or above the centerline of the horizontal piping, as shown in Figure 1.

IMPORTANT: In steam applications, install the valve with the stem horizontal to the piping. Failure to follow these guidelines may shorten the life of the actuator.

To minimize heat transfer in steam applications, wrap the valve and piping with insulation.

Allow at least 4 in. (102 mm) of clearance from the top of the shaft to remove the actuator (as noted in dimensions).

When mounting the actuator in the field and before installing the actuator, use an adjustable wrench to manually rotate the valve stem several times. This rotation breaks the torque that may have built up during long-term storage.

IMPORTANT: Do not attempt to manually rotate the drive shaft while the actuator is installed without first releasing the actuator gears. Manually rotating the drive shaft without releasing the actuator gears may result in permanent damage to the actuator.

IMPORTANT: Take care to prevent foreign material such as weld slag, thread burrs, metal chips, and scale from entering the piping system. This debris can damage or severely impede the operation of the valve by embedding itself in the seats, scoring the valve, and ultimately resulting in seat leakage. If the debris becomes embedded in the seats, subsequent flushing and filtering of the piping system with the valve installed does not remedy the problem.

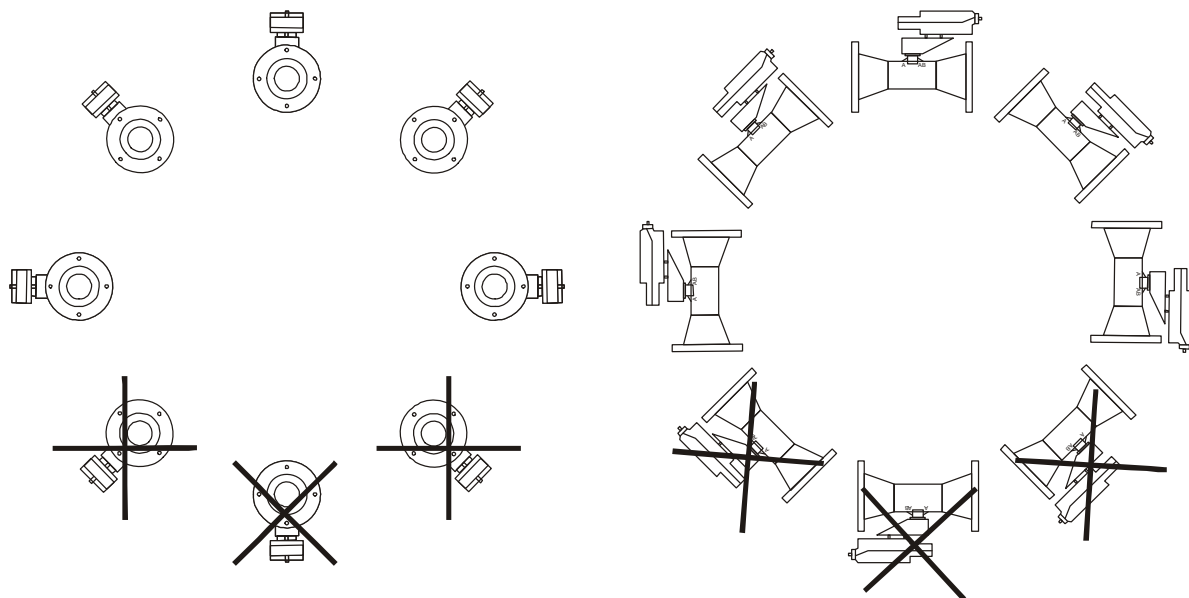
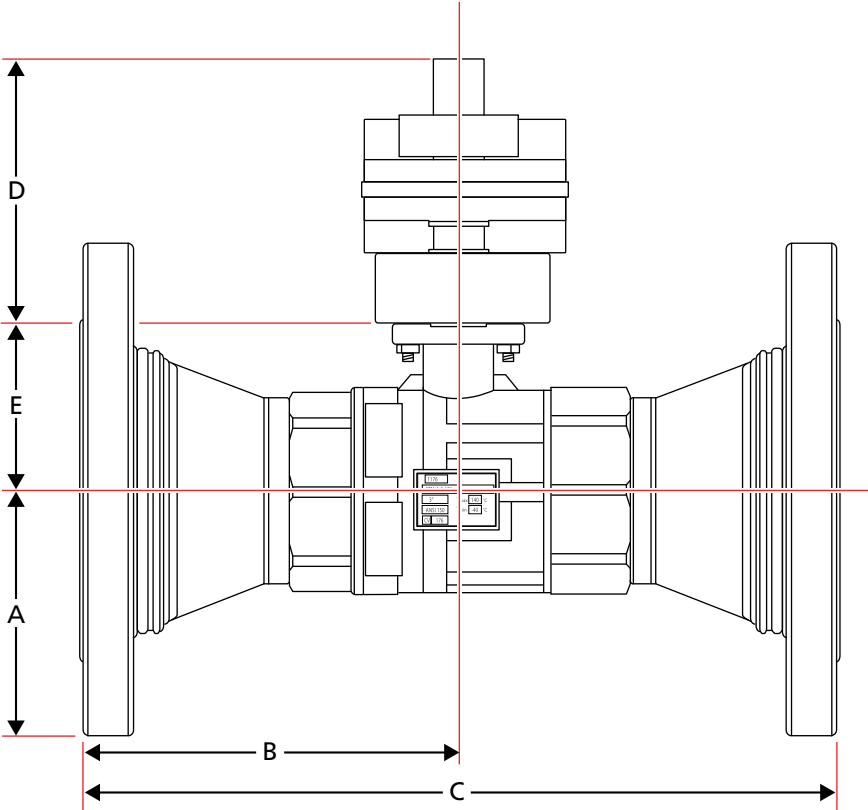
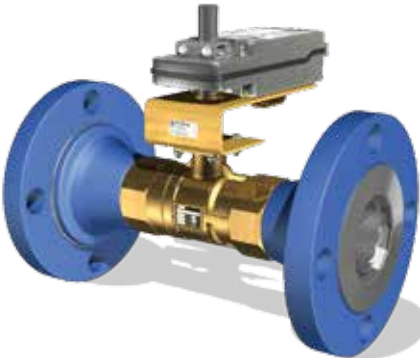


Figure 1: Recommended Mounting Positions for Non-Steam Applications

STM - 2-Way Dimensions

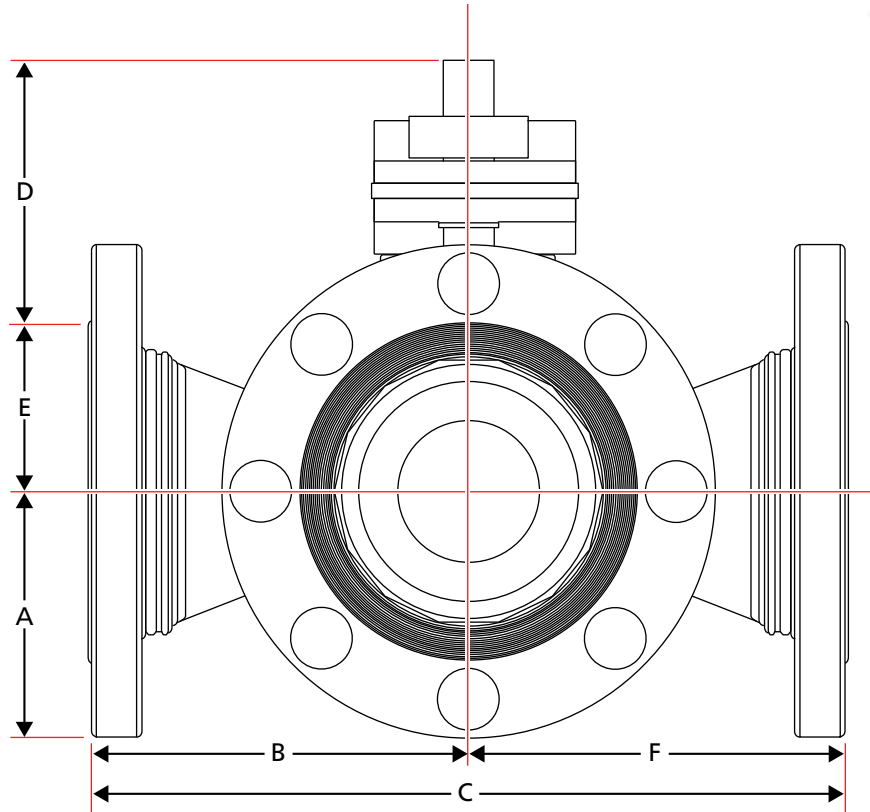


2-Way STM Dimensions

Valve Models	Size in.(mm)	Flow Coefficient		Bolt Hole Diameter	Number of Bolt Holes	A	B	C	D	E	Weight	
		Cv	Kv								lbs.	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)	6.00 (152)	2.90 (74)	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)	6.00 (152)	2.90 (74)	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)	6.00 (152)	2.90 (74)	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.

STM - 3-Way Dimensions



3-Way STM Dimensions

Valve Models	Size in.(mm)	Flow Coefficient		Bolt Hole Diameter	Number of Bolt Holes	A	B	C	D	E	F <small>3-way only</small>	Weight	
		Cv	Kv									lbs.	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)	6.00 (152)	2.90 (74)	2.90 (74)	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)	6.00 (152)	2.90 (74)	2.90 (74)	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)	6.00 (152)	2.90 (74)	2.90 (74)	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.

STM - Mounting

Location Considerations

IMPORTANT: Protect the actuator from dripping water, condensation, and other moisture. Water or moisture could result in an electrical short, which may damage or affect the operation of the actuator.

IMPORTANT: Do not cover the actuator with thermal insulating material. High ambient temperatures may damage the actuator, and a hot water pipe, a steam pipe, or other heat source may overheat it.

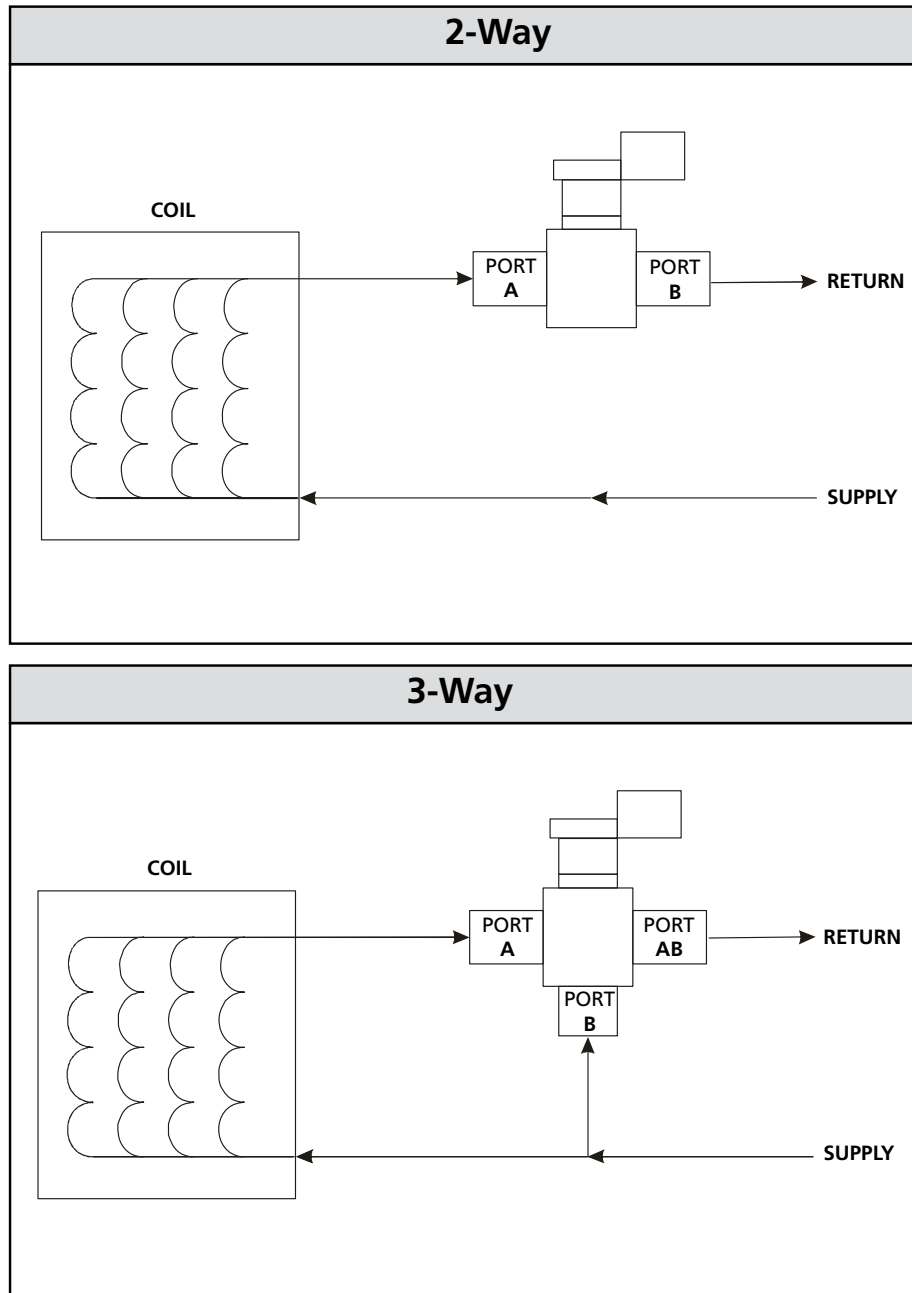
Piping

Be sure to wire the input lines to the electric actuator correctly for the valve to move in the proper direction. See piping diagrams below for typical two- and three-way piping configurations.

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

IMPORTANT: Use copper conductors only. Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the actuator's electrical ratings.

STM - Piping Diagrams



STM - Setup and Adjustments

Port A has the flow characterizing disk. Connect Port A to the outlet from the coil. On three-way models, use Port B as the bypass port.

Two-way STM Series Ball Valves are fully open when the electric actuator is fully Counterclockwise (CCW) and fully closed when the electric actuator is fully Clockwise (CW).

For three-way valves, the Coil Port A and Common Port AB are fully open when the electric actuator is fully CCW, as shown in Figure 1. The Bypass Port B and Common Port AB are fully open when the actuator is fully CW, as shown in Figure 2.

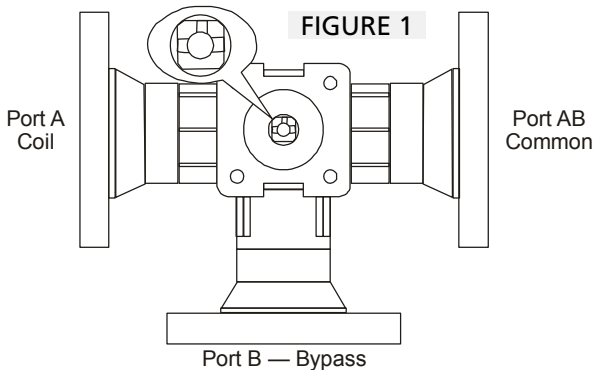


Figure 1: STM Series Three-Way Ball Valve (Coil Port A Open to Common Port AB)

For non-spring return and spring-to-open proportional control models in the Direct Acting (DA) mode, a minimum control signal drives the electric actuator to the fully CCW position while a maximum control signal drives the electric actuator in the fully CW position.

For spring-to-close proportional control models in the DA mode, a minimum control signal drives the electric actuator to the fully CW position, while a maximum control signal drives the electric actuator to the fully CCW position.

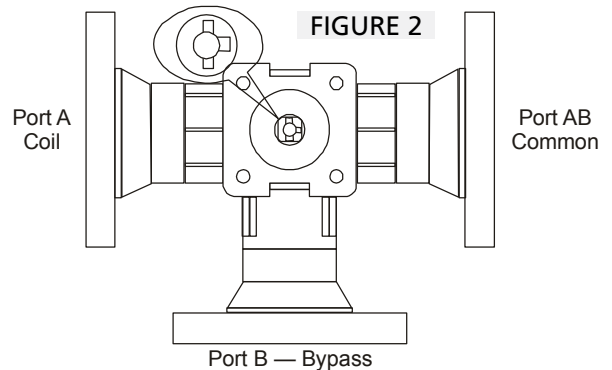


Figure 2: STM Series Three-Way Ball Valve (Bypass Port B Open to Common Port AB)

STM - Troubleshooting

Servicing the Actuator or Piping System

When servicing the electric actuator or the piping system:

- Disconnect the power supply to the actuator.

WARNING: Risk of Electric Shock. Disconnect each of multiple power supplies before making electrical connections. More than one disconnect may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

- Relieve the pressure in the piping system

CAUTION: Risk of Property Damage. Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

Technical Specifications

Service		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 25psig (172kPa) 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 Closeoff 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