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## **Characterized Port Two Way Ball Valves Technical Instructions**



The Characterized Port (-CP) 2-way Ball Valves are coupled with our Type A actuators to provide equal percentage flow control. The ball valves are 1/4-turn rotary control valves and are available in 1/2-inch to 2-inch line sizes.

### **Features:**

- ANSI 250 valve body rating.
- 200 psi close-off with ANSI Class IV leakage for all line sizes and actuators.
- Available with chrome-plated brass ball and brass stem or stainless steel ball and stem.
- Blow-out proof stem withstands high pressure.
- Universal mounting plate.
- Actuator and plate can be rotated (90 degree increments).
- Standoffs provide a thermal barrier between the actuator and the mounting plate.
- Operating handle for manual operation.



### **Warning/Caution Notations:**

<b>WARNING:</b>		Personal injury/loss of life may occur if you do not perform a procedure as specified.
<b>CAUTION:</b>		Equipment damage may occur if you do not perform a procedure as specified.

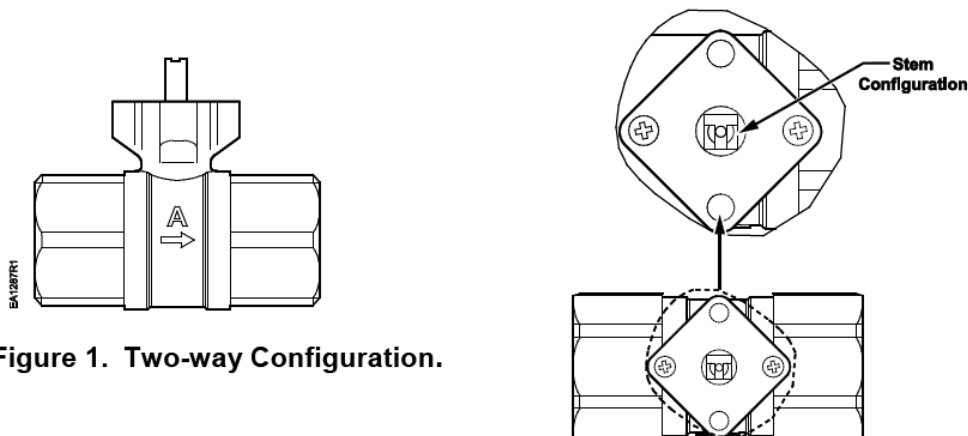


## **Specifications:**

- Valve body rating: ANSI 250/600 WOG
- Media temperature: 35°F to 250°F (2°C to 121°C)
- Controlled medium: Water, water-glycol solutions to 50%
- Body: Brass - ASTM B283, C37700
- Ball: Chrome-plated brass or stainless steel
- Ball seals: Glass filled PTFE with EPDM O-rings
- Flow characterizer: Glass filled PTFE
- End connections: Female NPT
- Stem: Brass or stainless steel
- Stem seals: EPDM O-rings
- Angle of rotation: 0° to 90°
- Close-off rating: 200 psi (ANSI Class IV)
- Dimensions and service envelope: See Figure 5 and Table 12.

## **Application:**

Ball valves can control hot or chilled water and up to 50% water-glycol solution in air handling units, convectors, fan coil units, unit conditioners, radiators, and reheat coils.

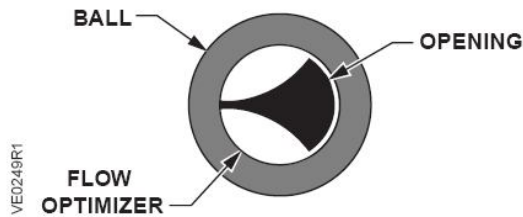


**Figure 1. Two-way Configuration.**

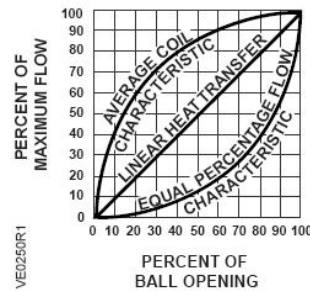


## Operation:

The parabolic shape of the flow characterizer orifice (Figure 2) provides a slowly opening valve. Equal movements of the valve stem, at any point of the flow range, change the existing flow an equal percentage regardless of the existing flow. The ball valve equal percentage flow characteristic (Figure 3) mirrors the flow characteristic of a coil, resulting in linear heat transfer.



**Figure 2. Ball Valve Flow Optimizer**



**Figure 3. Ball Valve Equal Percentage Flow Control**

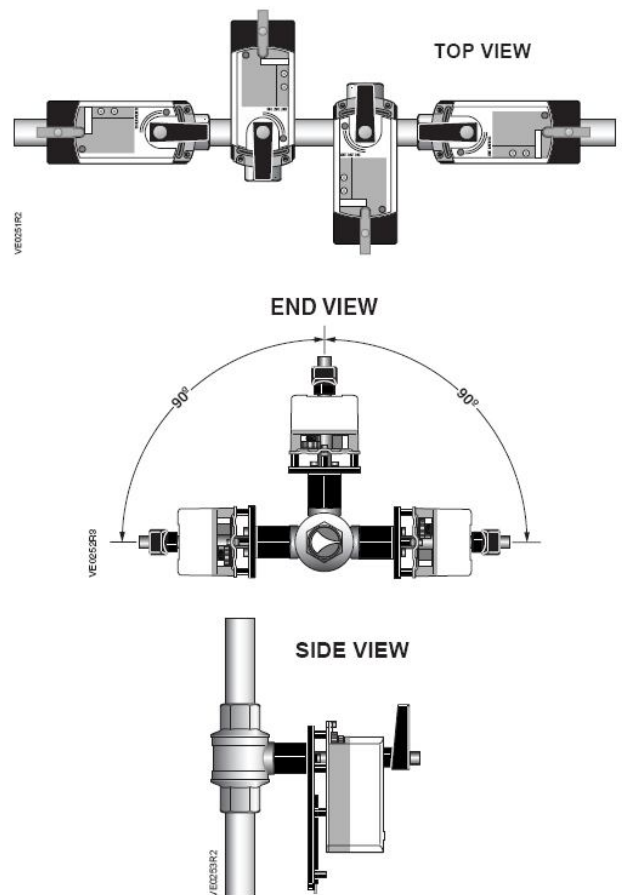
## Mounting and Installation:

- Install the valve so that the flow follows the direction of the arrow cast on the valve body.
- For added flexibility, the actuator mounting plate can be installed in any of the four (4) rotation angles relative to the valve body.
- For best performance, install the valve assembly with the actuator above the valve body.
- The valve and actuator assembly can be installed in a horizontal pipe in any position between vertical and 90°.
- The ball valve also can be installed vertically.

### CAUTION

Do not install the valve assembly so that the actuator is below horizontal or upside-down.

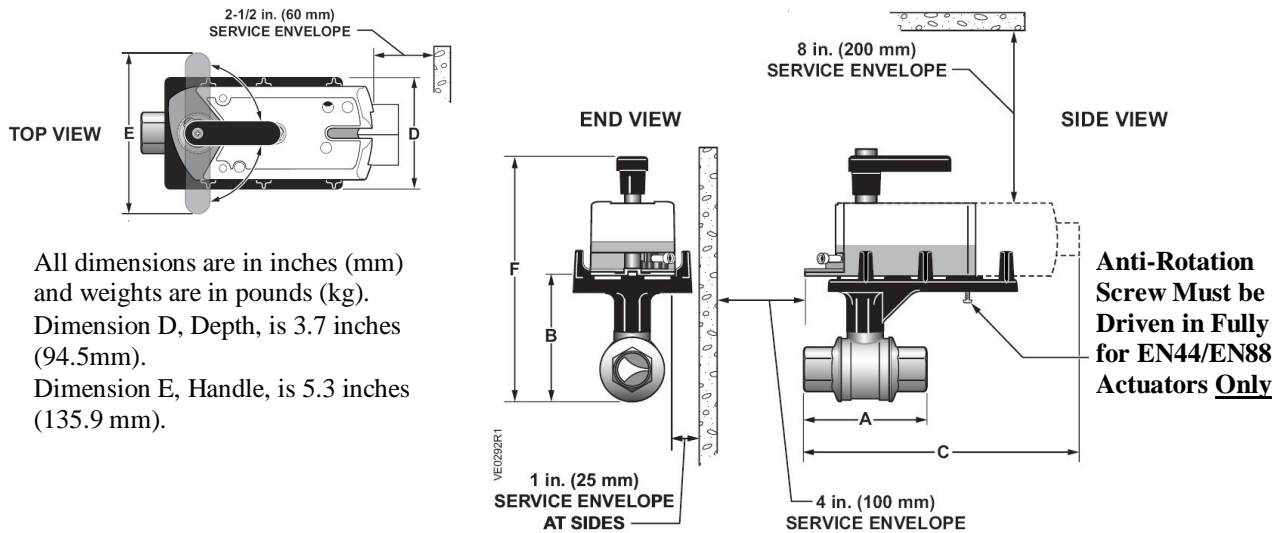
Allow sufficient space for servicing the valve and actuator. See Figure 5 and Table 12 for valve body dimensions and service envelope.



**Figure 4. Mounting Positions**



**Figure 5. Dimensions with Actuator Mounted on Bracket**



- All dimensions are in inches (mm) and weights are in pounds (kg).
- Dimension D, Depth, is 3.7 inches (94.5mm).
- Dimension E, Handle, is 5.3 inches (135.9 mm).

**Table 1. Dimensions in Inches (Millimeters) and Weights in Pounds (Kg)**

Line Size Inch (mm)	Cv Range	A Length	C Length * Actuators  EN44 & EN88	C Length * Actuators  ES20	C Length* Actuators  ES62	F Height	Weight lbs (kg)
1/2 (15)	0.4 to 10.0	2-7/16 (61)	6-11/16 (170)	6 (153)	—	7-5/8 (193)	.50 (.23)
3/4 (20)	6.3 to 25	2-3/4 (70)		6 (153)	—	8 (204)	.78 (.35)
1 (25)	10	3 (77)		—	8-3/8 (213)	8 (204)	.97 (.44)
	16	3-1/4 (82)		—	8-3/8 (213)	8-5/15 (212)	1.75 (79)
	40, 63						1.19 (54)
		25		3-7/8 (98)	7 (178)	—	8-11/16 (221)
1-1/4 (32)	16	3-3/8(86)	6-11/16 (170)	—	8-7/16 (214)	8-3/8 (213)	1.41 (.64)
	25 to 100	3-11/16 (94)	6-15/16 (176)	—	8-11/16 (221)	8-13/16 (223)	1.81 (.82)
1-1/2 (40)	25, 63	3-5/8 (92)		—	8-7/16 (214)	8-13/16 (223)	1.19 (.54)
	40, 100, 160	3-15/16 (100)	7-1/16 (180)	—	8-3/4 (223)	9-1/4 (235)	2.50 (1.13)
2 (50)	40, 100	4 (102)			—		9-3/8 (238)
	63	4-5/8 (118)	7-1/2 (190)	—	9-1/8 (223)	10-1/16 (255)	4.66 (2.11)
	160			—			4.69 (2.13)

\* Dimension "C" is maximum length, measured from the actuator, end fitting, or mounting plate, whichever extends the furthest.

**Table 2. Two-Way Ball Valve Part Numbers, Close-off Ratings and CV's**

Two-Way Size (In.)	Cv	Close off	Chrome Part No.	SS Trim Part No.
1/2"	0.4	200 PSI	2-050-0.4-CP	2-050-0.4-CP-SBS
1/2"	0.63		2-050-0.63-CP	2-050-0.63-CP-SBS
1/2"	1.0		2-050-1.0-CP	2-050-1.0-CP-SBS
1/2"	1.6		2-050-1.6-CP	2-050-1.6-CP-SBS
1/2"	2.5		2-050-2.5-CP	2-050-2.5-CP-SBS
1/2"	4.0		2-050-4.0-CP	2-050-4.0-CP-SBS
1/2"	6.3		2-050-6.3-CP	2-050-6.3-CP-SBS
1/2"	10		2-050-10-CP*	2-050-10-CP-SBS*
3/4"	6.3		2-075-6.3-CP	2-075-6.3-CP-SBS
3/4"	10		2-075-10-CP	2-075-10-CP-SBS
3/4"	16		2-075-16-CP	2-075-16-CP-SBS
3/4"	25		2-075-25-CP*	2-075-25-CP-SBS*
1"	10		2-100-10-CP	2-100-10-CP-SBS
1"	16		2-100-16-CP	2-100-16-CP-SBS
1"	25		2-100-25-CP	2-100-25-CP-SBS
1"	40		2-100-40-CP	2-100-40-CP-SBS
1"	63		2-100-63-CP*	2-100-63-CP-SBS*
1-1/4"	16		2-125-16-CP	2-125-16-CP-SBS
1-1/4"	25		2-125-25-CP	2-125-25-CP-SBS
1-1/4"	40		2-125-40-CP	2-125-40-CP-SBS
1-1/4"	63		2-125-63-CP	2-125-63-CP-SBS
1-1/4"	100		2-125-100-CP*	2-125-100-CP-SBS*
1-1/2"	25		2-150-25-CP	2-150-25-CP-SBS
1-1/2"	40		2-150-40-CP	2-150-40-CP-SBS
1-1/2"	63		2-150-63-CP	2-150-63-CP-SBS
1-1/2"	100		2-150-100-CP	2-150-100-CP-SBS
1-1/2"	160		2-150-160-CP*	2-150-160-CP-SBS*
2"	40		2-200-40-CP	2-200-40-CP-SBS
2"	63		2-200-63-CP	2-200-63-CP-SBS
2"	100		2-200-100-CP*	2-200-100-CP-SBS*
2"	160		2-200-160-CP*	2-200-160-CP-SBS*

\* Denotes a full-port valve without flow optimizer insert.