

### Description

The VCB-46 series, NPT, three-way, **mixing or diverting**, control ball valves are designed for the precise control of hot or chilled water in pneumatic HVAC applications. Valves range in size from 1/2 to 2-1/2 inches and feature an optimizing insert (except for indicated models), which reduces and characterizes the ball opening for equal percentage flow. This design allows the output at the coil to be linear when compared to the open area of the ball.

The valve's dual Teflon ball and stem seals and EPDM O-rings provide leak-proof shut off and meet both "packed" and "packless" construction specifications. The reduced torque seals and O-rings eliminate the need for high torque actuators. KMC's MCP-3631 series actuators work on all valve sizes.

### Features

- ◆ Mixing or diverting
- ◆ Actuator can easily be flipped over in the field to change the fail direction
- ◆ Equal percentage flow characteristics with optimizer insert (except indicated models)
- ◆ Cv ratings similar to globe valves
- ◆ Field repairable valve stem design
- ◆ Leak-proof shutoff
- ◆ Standard "T" pattern connections

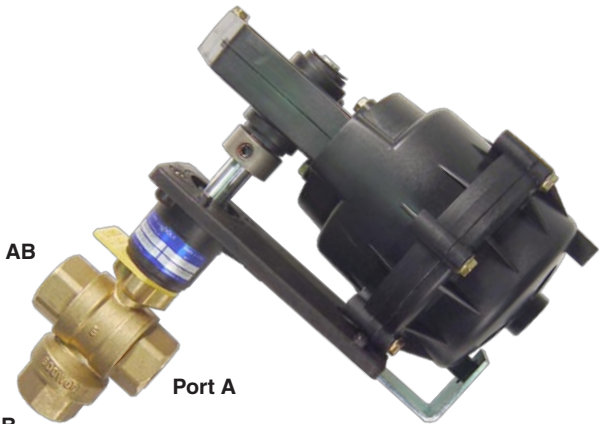
### Accessories and Replacement Parts

HLO-1006	Replacement drive bushing
HLO-1009	Replacement push-on shaft retainer ring
HPO-0038	Replacement diaphragm
HPO-5072	Repair kit (bracket/linkage)

NOTE: For more information, see the data sheet for the MCP-3631 series actuators (003-035-01).

### ⚠ CAUTION

Using mineral oil lubricants or other incompatible substances in system fluids may damage EPDM rubber seals in valves. Before using any lubricant or additive in a water or ethylene glycol base, consult the substance manufacturer for compatibility with EPDM (Ethylene Propylene Diene Monomer).



### Models

See the charts below and the next page.

VCB-46 XXX BF X

#### Actuators

- E: MCP-3631-5000, 8 to 13 psi range
- F: MCP-3631-3000, 5 to 10 psi range

#### Pipe Size/Cv

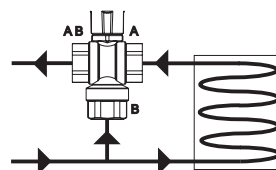
- 02C: 1/2"/0.6 Cv
- 02E: 1/2"/1.0 Cv
- 02G: 1/2"/2.4 Cv
- 02J: 1/2"/4.3 Cv
- 02L: 1/2"/8.0 Cv
- 03G: 3/4"/2.4 Cv
- 03J: 3/4"/3.8 Cv
- 03M: 3/4"/11 Cv\*
- 04H: 1"/8.6 Cv

- 04N: 1"/22.3 Cv
- 05E: 1-1/4"/12.7 Cv
- 05J: 1-1/4"/34.1 Cv\*
- 06E: 1-1/2"/23.5 Cv
- 06H: 1-1/2"/61.1 Cv
- 08B: 2"/38.2 Cv
- 08N: 2"/108.5 Cv
- 10E: 2-1/2"/74.1 Cv
- 10F: 2-1/2"/99.5 Cv\*

\* Full-port, no optimizer insert

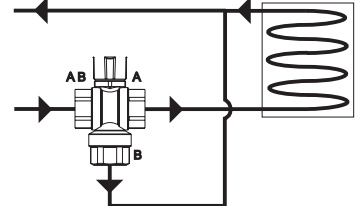
#### Mixing Flow Action:

Full CCW (w/ air) = Port A to AB  
Full CW (w/o air) = Port B to AB



#### Diverting Flow Action:

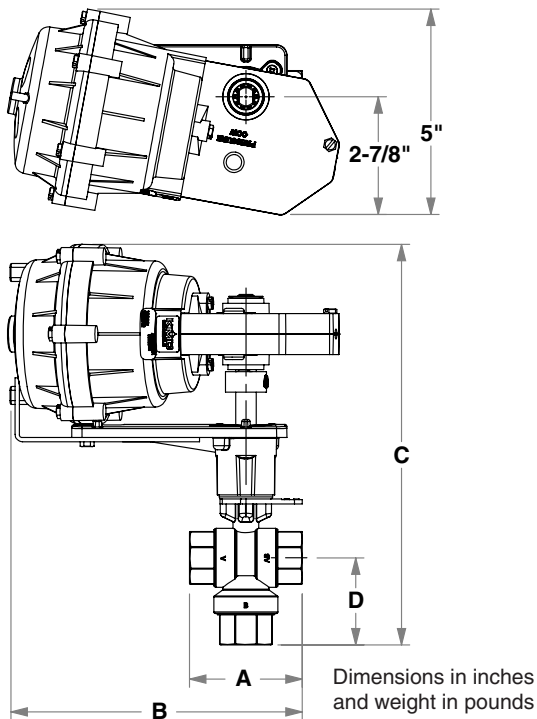
Full CCW (w/ air) = Port AB to A  
Full CW (w/o air) = Port AB to B



### ⚠ CAUTION

Pneumatic devices must be supplied with clean, dry control air. Any other medium (e.g., oil or moisture contamination) will cause the device to fail.

## Details



Line Size	Model Number	Cv	Dim. A	Dim. B	Dim. C	Dim. D	Weight (lbs.)	
1/2"	VCB-4602	CBF $\bar{X}$	0.6	3.50	7.52	9.35	2.40	3.4
		EBF $\bar{X}$	1.0					
		GBF $\bar{X}$	2.4					
		JBF $\bar{X}$	4.3					
		LBF $\bar{X}$	8.0					
3/4"	VCB-4603	GBF $\bar{X}$	2.4	2.80	7.02	10.12	2.00	3.4
		JBF $\bar{X}$	3.8					
		MBF $\bar{X}$	11					
1"	VCB-4604	HBF $\bar{X}$	8.6	3.00	7.32	11.12	2.60	4.1
		NBF $\bar{X}$	22.3					
1-1/4"	VCB-4605	EBF $\bar{X}$	12.7	3.60	7.82	11.62	2.80	5.3
		JBF $\bar{X}$	34.1					
1-1/2"	VCB-4606	EBF $\bar{X}$	23.5	4.00	7.82	12.32	3.30	7.0
		HBF $\bar{X}$	61.1					
2"	VCB-4608	BBF $\bar{X}$	38.2	4.00	7.82	12.32	3.30	7.0
		NBF $\bar{X}$	108.5					
2-1/2"	VCB-4610	EBF $\bar{X}$	74.1	5.00	8.32	13.62	3.80	10.9
		FBF $\bar{X}$	99.5					

## Specifications

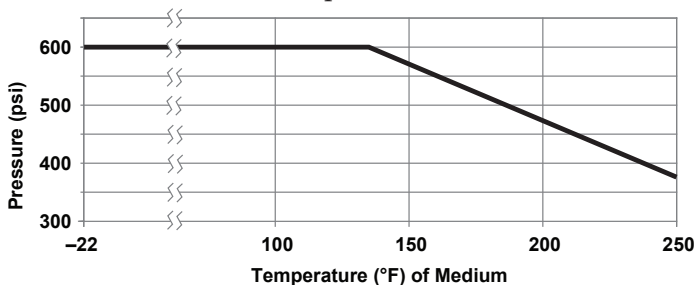
<b>Service</b>	Hot or chilled water, up to 50% glycol
<b>Connections</b>	Female NPT
<b>Flow Characteristics</b>	Equal percentage (with optimizer insert)
<b>Rangeability</b>	500:1
<b>Leakage</b>	ANSI Class IV (<0.01% of Cv)
<b>Max. Close off</b>	1/2 to 1" = 50 psi (345 kPa); 1-1/4 to 2-1/2" = 40 psi (276 kPa)

### Temperature Limits

Medium	-22° to 250° F (-30° to 121° C)
Operating	-20° to 180° F (-29° to 82° C)
Shipping	-40° to 140° F (-40° to 60° C)

**NOTE:** If the application requires operation near the maximum temperature and maximum pressure, add a tubing restraint to the actuator connection.

**Body Rating** 360 to 600 psi (temperature dependent—see chart below)



### Valve Body Material

Body	Forged brass ASTM B283
Stem	Brass
Ball	Nickel-plated brass
Flow inserts	Glass filled polymer
Stem Seals	Dual Teflon & one EPDM O-ring
Ball Seals	Teflon seals w/ EPDM O-rings

### Actuator Material

Body	Glass-filled nylon
Diaphragm	Neoprene

### Normal Rotation

90°

### Supply Pressure

0 to 20 psig (138 kPa) operating; 30 psig (207 kPa) maximum (see NOTE under Temperature Limits)

**Supply Connection** 3/16" (5 mm) fitting for 1/4" (6 mm) OD polyethylene tubing

**NOTE:** For more information, see the data sheet for the MCP-3631 series actuators (003-035-01).

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