

# Victaulic® Series 78KV Balancing Valve



106.05

## PROJECT INFORMATION

Project  
Contractor  
Job  
Engineer  
Date



## 1.0 PRODUCT DESCRIPTION

**Available Sizes:** ½ – 2"/DN15 – DN50

**Application/Function:** Heating (not including steam) and cooling systems/balancing, pre-setting, measuring, and shut-off

**Maximum Working Pressure (Male NPT Union x Female NPT):** 400 psi/2758 kPa/28 Bar

**Maximum Working Pressure (Male NPT Union x Copper Press):** 300 psi/2068 kPa/21 Bar

**Operating Temperature Range:** -4°F to 248°F/-20°C to +120°C

## 2.0 CERTIFICATIONS/LISTINGS

Product manufactured by Victaulic and/or certified suppliers in accordance with ISO-9001.

## 3.0 MATERIALS AND DESIGN

**Body, Flow Controller, and PT Valves:** Dezincification-resistant brass alloy, equivalent to UNS C35330

**O-ring:** EPDM

**Bonnet, Disc Assembly, and Stem:** Dezincification-resistant brass alloy, equivalent to UNS C35330

**Hand Wheel Assembly:** ABS

**Nut and Set Screw:** Stainless Steel, Type 304

**Packing Nut:** Brass, equivalent to UNS C38000

**Packing and Washer:** PTFE

## 4.0 AVAILABLE ACCESSORIES

- Standard PT Ports
- PT Port Extensions
- Hand Wheel
- Memory Stop Hex Key

## 5.0 VALVE SELECTION GUIDE

Nominal Size inches DN	Actual Outside Diameter inches mm	Absolute Minimum Flow Rate GPM LPM	Nominal Minimum Flow Rate GPM LPM	Nominal Maximum Flow Rate GPM LPM	Absolute Maximum Flow Rate GPM LPM
½ L DN15 L	0.840 21.3	0.10 0.45	0.15 0.68	0.86 3.91	2.53 11.5
½ DN15	0.840 21.3	0.07 0.32	0.10 0.45	3.09 14.0	9.09 41.3
¾ DN20	1.050 26.9	0.32 1.45	0.49 2.23	6.54 29.7	19.3 87.5
1 DN25	1.315 33.7	0.26 1.18	0.39 1.77	10.1 45.7	29.6 135
1 ¼ DN32	1.660 42.4	0.53 2.41	0.81 3.68	17.4 79.1	51.2 233
1 ½ DN40	1.900 48.3	0.68 3.09	1.03 4.68	25.2 115	74.3 338
2 DN50	2.375 60.3	1.38 6.27	2.09 9.50	39.5 180	116 528

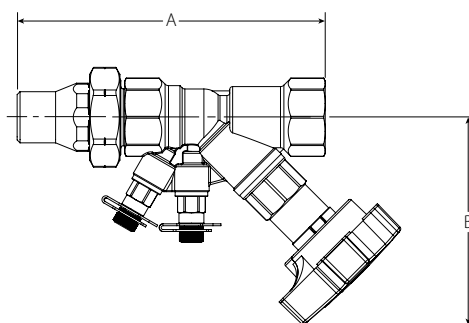
Sizing may be accomplished by using the nominal range of flows provided. Nominal flow rates are based on 1-psi pressure drop with minimum at half turn and maximum at fully open. Absolute flow rates are established by calculating the flow through the valve at its minimum recommended opening position (half turn) with a pressure drop of 1-ft of water and maximum opening position (fully open) with a pressure drop of 20-ft of water. These ranges were chosen as they are achievable by most systems and common measurement equipment.

Flows outside this the nominal range are achievable. It is the responsibility of the system designer to determine whether system conditions such as available differential pressure, maximum component pressure drop and velocity limits, and measurement accuracy will allow valve sizing outside this nominal range. However, it is not recommended to exceed the maximum flow rates listed above. Excessive pressure drop may cause excessive noise or cavitation within the system.

THE INFORMATION CONTAINED ON THIS PAGE IS NOT INTENDED TO REPLACE THE FULL PRODUCT DATA LISTED LATER IN THIS DOCUMENT. THOROUGHLY READ AND UNDERSTAND ALL INSTALLATION INSTRUCTIONS AND PRODUCT SAFETY INFORMATION BEFORE INSTALLING THIS PRODUCT.



## 6.0 DIMENSIONS



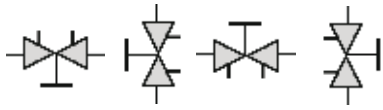
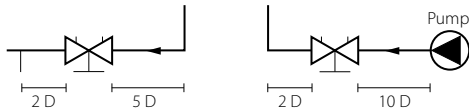
Size				Dimensions				Weight	
Nominal inches DN			Actual Outside Diameter inches DN		A End to End Male NPT Union x Female NPT inches mm	A End to End Male NPT Union x Copper Press inches mm	B Center to Top inches mm	Approximate (Each) lb kg	
½ DN15	x	½ DN15	x	0.840 21.3	0.840 21.3	5.07 128	6.24 158	4.00 102	1.37 0.6
		¾ DN20		1.050 26.9	5.45 138	6.82 174	4.10 104	1.67 0.8	
		1 DN25		1.315 33.7	6.19 158	7.70 196	4.30 110	1.97 0.9	
		1 ¼ DN32		1.660 42.4	6.82 174	8.50 216	4.70 120	3.73 1.7	
¾ DN20	x	¾ DN20	x	1.050 26.9	1.050 26.9	5.68 144	7.05 180	4.10 104	1.79 0.8
		1 DN25		1.315 33.7	6.17 156	7.68 196	4.30 110	2.00 0.9	
		1 ¼ DN32		1.660 42.4	6.80 172	8.48 216	4.70 120	3.82 1.7	
		1 ½ DN40		1.900 48.3	7.40 188	9.42 240	5.10 130	5.08 2.3	
1 DN25	x	1 DN25	x	1.315 33.7	1.315 33.7	6.44 164	7.95 202	4.30 110	2.08 0.9
		1 ¼ DN32		1.660 42.4	6.96 176	8.64 220	4.70 120	3.84 1.7	
		1 ½ DN40		1.900 48.3	7.56 192	9.58 244	5.10 130	5.10 2.3	
		2 DN50		2.375 60.3	8.31 212	10.69 272	5.50 140	6.60 3.0	
1 ¼ DN32	x	1 ¼ DN32	x	1.660 42.4	1.660 42.4	7.22 184	8.90 226	4.70 120	3.87 1.8
		1 ½ DN40		1.900 48.3	7.82 198	9.84 250	5.10 130	5.13 2.3	
		2 DN50		2.375 60.3	8.58 218	10.96 278	5.50 140	6.65 3.0	
1 ½ DN40	x	1 ½ DN40	x	1.900 48.3	1.900 48.3	8.08 206	10.10 256	5.10 130	5.24 2.4
		2 DN50		2.375 60.3	8.63 220	11.01 280	5.50 140	6.67 3.0	
2 DN50	x	2 DN50	x	2.375 60.3	2.375 60.3	8.74 222	11.12 282	5.50 140	6.72 3.0

7.0 PERFORMANCE

Measuring Accuracy

The hand wheel zero position is calibrated and shall not be changed. Valves have a flow measurement accuracy of 2% to 3% when used within their recommended flow range and installed in accordance with the figure below.

**NOTE:** For the most accurate results, a differential pressure meter should be used. For optimal flow accuracy, the valve should be installed with the hand wheel toward the downstream end.



Valve may be installed in any orientation.

For accuracy of measurement, it is recommended that the valve be installed (10) pipe diameters downstream of a pump or (5) pipe diameters downstream of elbows, valves, or other pipe fittings. In all cases, (2) pipe diameters should be located downstream of the valve.

Size		Flow Characteristics
Nominal inches DN	Actual Outside Diameter inches mm	Integrated Orifice C <sub>v</sub> K <sub>v</sub>
½ L DN15 L	0.840 21.3	0.91 0.79
½ DN15	0.840 21.3	4.63 4.00
¾ DN20	1.050 26.9	13.6 11.8
1 DN25	1.315 33.7	18.2 15.7
1 ¼ DN32	1.660 42.4	29.5 25.6
1 ½ DN40	1.900 48.3	27.1 23.5
2 DN50	2.375 60.3	67.3 58.2

## 7.1 PERFORMANCE

### C<sub>v</sub> Values for Valve at Various Hand Wheel Settings

#### Series 78KV

The values below may be used when calculating and sizing a piping system.

Number of Turns	Nominal Size inches DN						
	½ L DN15 L	½ DN15	¾ DN20	1 DN25	1 ¼ DN32	1 ½ DN32	2 DN25
	C <sub>v</sub> K <sub>v</sub>	C <sub>v</sub> K <sub>v</sub>	C <sub>v</sub> K <sub>v</sub>	C <sub>v</sub> K <sub>v</sub>	C <sub>v</sub> K <sub>v</sub>	C <sub>v</sub> K <sub>v</sub>	C <sub>v</sub> K <sub>v</sub>
0.50	0.15	0.10	0.49	0.39	0.81	1.03	2.09
	0.13	0.09	0.42	0.34	0.70	0.89	1.81
1.00	0.44	0.44	0.84	1.13	2.57	3.97	4.22
	0.38	0.38	0.73	0.98	2.22	8.24	3.65
1.50	0.64	0.74	1.97	3.64	6.03	8.17	11.1
	0.55	0.64	1.70	3.15	5.22	12.5	9.58
2.00	0.73	1.10	2.86	5.46	9.19	13.2	18.1
	0.63	0.95	2.47	4.72	7.95	11.5	15.6
2.50	0.80	1.41	3.55	6.89	12.1	15.9	24.7
	0.69	1.22	3.07	5.96	10.5	13.8	21.4
3.00	0.84	1.92	4.74	8.15	14.4	19.7	30.5
	0.73	1.66	4.10	7.05	12.5	17.0	26.4
3.50	0.86	2.52	5.90	9.37	16.2	22.6	35.2
	0.74	2.18	5.10	8.11	14.0	19.6	30.4
4.00 <sup>1</sup>	0.86	3.09	6.54	10.1	17.4	25.2	39.5
	0.74	2.67	5.66	8.70	15.1	21.8	34.2

L = Low flow

<sup>1</sup> Full open valve

## 7.2 PERFORMANCE

### Correction Factors

For liquids other than water, the flow values can be adjusted as follows:

Divide the flow rate by the square root of the specific gravity.

$$\text{Actual Flow} = \frac{q_{\text{Calculated}}}{\sqrt{SG}}$$

This applies to liquids having, on the whole, the same viscosity as water, i.e. most water/glycol mixtures and water/brine solutions at room temperature. At low temperatures, the viscosity increases and laminar flow may occur in certain valves. The risk increases with small valves, low settings and low differential pressures.

### Correction Factors

When  $\Delta p$  and the design flow rate are known, use the formula shown to calculate the CV value.

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM,  $\Delta p$  in Ft. of H<sub>2</sub>O

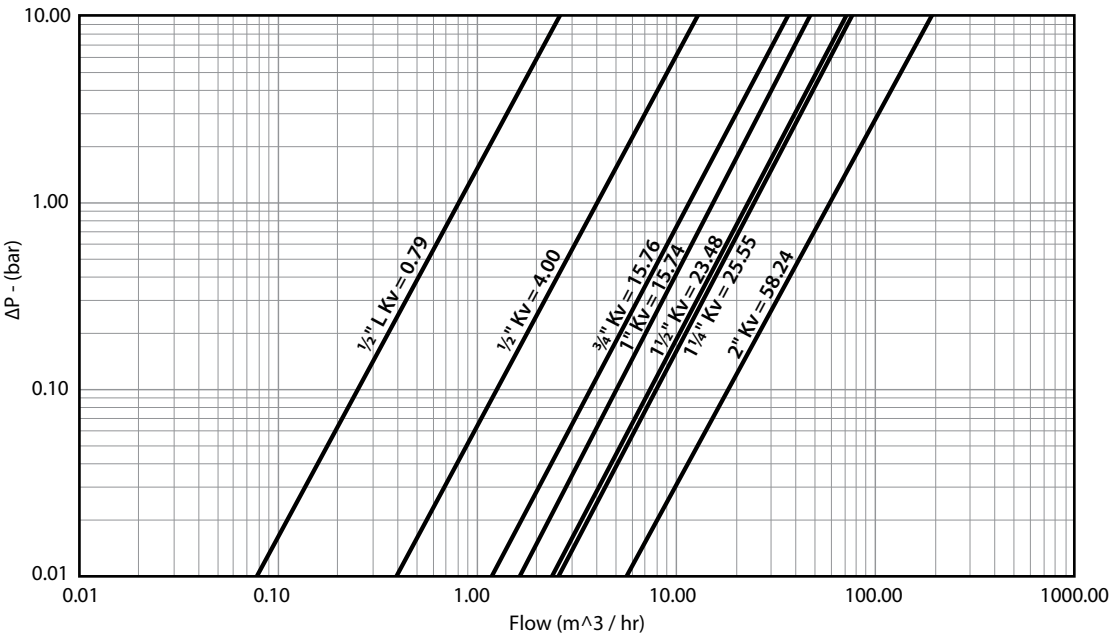
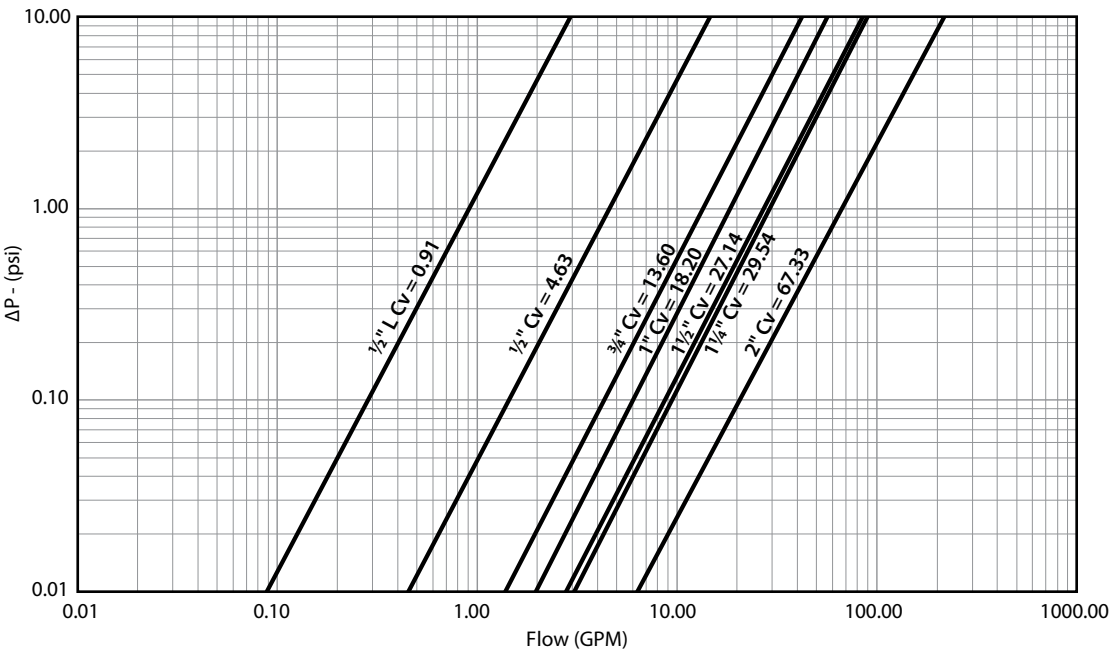
$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM,  $\Delta p$  in psi

#### NOTE:

- Suitable for water-glycol mixtures to 57%

7.3 PERFORMANCE

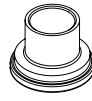


## 7.4 PERFORMANCE

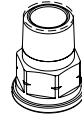
### Series 78KV Union Tailpieces (Optional)



Female Tailpiece



Sweat Tailpiece



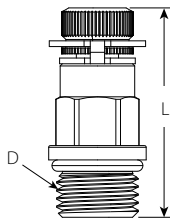
Male Tailpiece

Size			Victaulic Part Code		
Nominal <sup>1</sup> inches			Female Tailpiece	Sweat Tailpiece	Male Tailpiece
1/2	x	1/2	P00478Y304	P00478Y504	P00478U404
3/4	x	1/2	P00678Y304	P00678Y504	P00678U404
		3/4	P00678Y306	P00678Y506	P00678U406
1	x	1/2	P00678Y304	P00678Y504	P00678U404
		3/4	P00678Y306	P00678Y506	P00678U406
		1	P00678Y310	P00678Y510	P00678U410
1 1/4	x	1/2	—	—	P01278U404
		3/4	P01278Y306	P01278Y506	P01278U406
		1	P01278Y310	P01278Y510	P01278U410
		1 1/4	P01278Y312	P01278Y512	P01278U412
1 1/2	x	1/2	—	—	P01278U404
		3/4	P01278Y306	P01278Y506	P01278U406
		1	P01278Y310	P01278Y510	P01278U410
		1 1/4	P01278Y312	P01278Y512	P01278U412
		1 1/2	P01278Y314	P01278Y514	P01278U414
2	x	1	—	—	P02078U410
		1 1/4	P02078Y312	P01278Y512	P02078U412
		1 1/2	P02078Y314	P01278Y514	P02078U414
		2	P02078Y320	P02078Y520	P02078U420

7.4 PERFORMANCE (CONTINUED)

Accessories (Sold Separately)

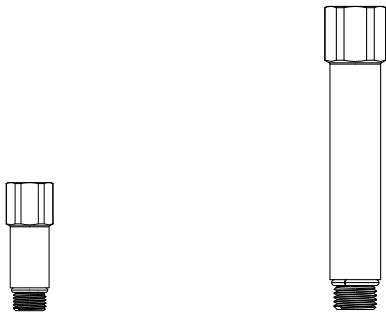
Replacement PT Ports



Size inches DN	L inches mm	D	Part Code
½ – 2 DN15 – DN50	1.75 45	¾ SAE	P000787RPT (Red) <sup>2</sup> P000787BPT (Blue) <sup>2</sup>

<sup>2</sup> When ordering, the part code includes only one PT port.  
Each valve requires two PT ports (one red, one blue).

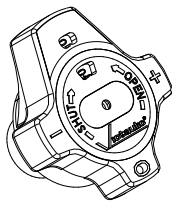
PT Port Extensions



2 1/51 mm Extension Part Code	4 1/102 mm Extension Part Code
P0007872PT <sup>3</sup>	P0007874PT <sup>3</sup>

<sup>3</sup> When ordering, the part code includes only one PT port extension.  
Each valve requires two PT port extensions.

Hand Wheel



Series 787V  
Plastic  
½ – 2"/DN15 – DN50

Part Code
P000787VHL

Memory Stop Hex Key

3-mm size for memory stop setting screw

Part Code
P000787V3M

## 8.0 NOTIFICATIONS

### ! WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, foot protection, and hearing protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

## 9.0 REFERENCE MATERIALS

[08.30: Victaulic® KOIL-KIT™ Coil Pack](#)

[08.34: Victaulic® Automatic Balancing Valves - Series 76T, 76B, 76K, 76V, 76G, and 76F](#)

[106.01: Victaulic® Series 786V Manual Balancing Valve](#)

[106.02: Victaulic® Series 787V Manual Balancing Valve](#)

[106.03: Victaulic Series 788V Manual Balancing Valve](#)

[106.04: Victaulic Series 789V Manual Balancing Valve](#)

[106.15: Victaulic® Series UBP Unibody PICV Balancing Valve](#)

[106.20: Victaulic® Series UBA Unibody ABV Balancing Valve](#)

[106.21: Victaulic® Series UBM Unibody Manual Balancing Valve](#)

[106.30: Victaulic® Series UH1 Braided Flexible Hose](#)

[I-786V/787V: Victaulic® Series 786V and 787V Manual Balancing Valves Installation and Maintenance Instructions](#)

[I-788V/789V: Victaulic® Series 788V and 789V Manual Balancing Valves Installation and Maintenance Instructions](#)

[I-UBA: Victaulic® Series UBA Unibody ABV Balancing Valve Installation and Maintenance Instructions](#)

[I-UBM: Victaulic® Series UBM Unibody Manual Balancing Valve Installation and Maintenance Instructions](#)

[I-UBP: Victaulic® Series UBP Unibody PICV Balancing Valve Installation and Maintenance Instructions](#)

[I-UH1: Victaulic® Series UH1 Braided Flexible Hose Installation and Use Guidelines](#)

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for determining the suitability of Victaulic products for their end-use application, in accordance with industry standards, project specifications, and Victaulic's published performance, maintenance, and safety data, as well as all warnings and installation instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, warranty, installation instructions, or this disclaimer.

### Installation

Always refer to and follow the [Victaulic Installation Handbook](#) or installation instructions for the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at victaulic.com.

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

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### Note

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