

Victaulic® Series 790V Balancing Valve for Potable Water Applications



106.09

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, potable water systems, balancing, pre-setting, measuring, shut-off.

Maximum Working Pressure: 400 psi/2758 kPa/28 Bar

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

2.0 CERTIFICATIONS/LISTINGS



IAPMO Certified in accordance with NSF/ANSI/CAN 61 for +180°F/+82°C potable water service and NSF/ANSI/CAN 372.

3.0 MATERIALS AND DESIGN

Body, Flow Controller, and Bonnet: Dezincification-resistant (DZR) low-lead brass, equivalent to CW511L

O-ring: EPDM

Disc Assembly: DZR low-lead brass, equivalent to CW511L, and EPDM

Stem: DZR brass, equivalent to CZ132

PT Valves: DZR low-lead brass, equivalent to UNS C46500

Hand Wheel Assembly: Glass fiber-reinforced nylon

Nut and Set Screw: Stainless Steel, Type 304

Packing Nut: Low-lead 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

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.



5.0 VALVE SELECTION GUIDE

Balancing Valve

Size		Flow Characteristics			
Nominal	Actual Outside Diameter	Absolute Minimum Flow Rate	Nominal Minimum Flow Rate	Nominal Maximum Flow Rate	Absolute Maximum Flow Rate
inches DN	inches mm	GPM LPM	GPM LPM	GPM LPM	GPM LPM
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

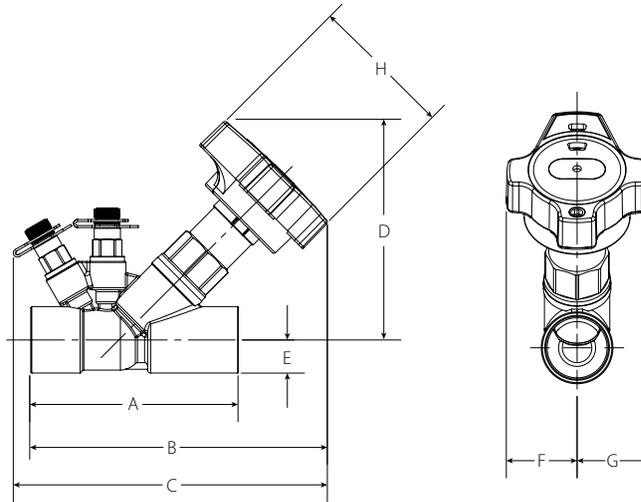
L = Low flow

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.

6.0 DIMENSIONS

Sweat Valve
 Series 790V
 Solder End



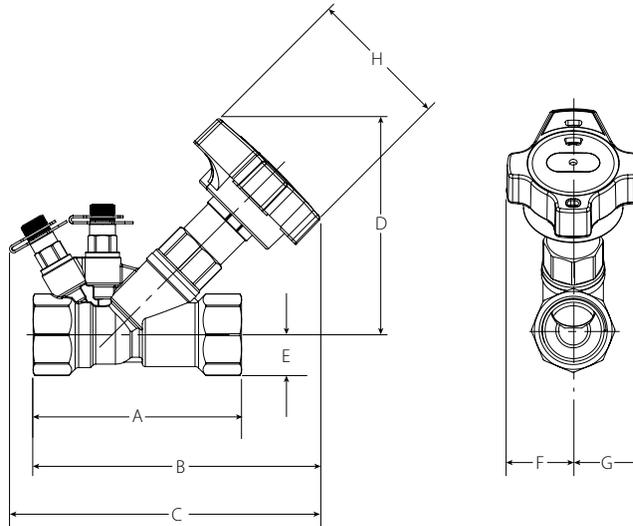
Series 790V
 1/2 - 2"/DN15 - DN50

Size		Dimensions								Weight
Number of Turns	Actual Outside Diameter	A End to End	B End to Handle	C Port to Handle	D CL to Top	E CL to Bottom	F CL to Widest Edge Left	G CL to Widest Edge Right	H Handle Width	Approx. (Each)
1/2	0.840	3.54	4.84	5.46	3.97	0.37	1.28	1.28	2.85	0.91
DN15	21.3	90	123	139	101	10	33	33	72	0.4
3/4	1.050	3.81	5.35	5.68	4.14	0.50	1.28	1.28	2.85	1.07
DN20	26.9	97	136	144	106	13	33	33	72	0.5
1	1.315	4.05	5.78	5.89	4.25	0.64	1.28	1.28	2.85	1.27
DN25	33.7	103	147	150	108	17	33	33	72	0.6
1 1/4	1.660	4.88	6.42	5.56	4.72	0.90	1.28	1.28	2.85	2.02
DN32	42.4	124	163	141	120	23	33	33	72	0.9
1 1/2	1.900	6.16	7.20	6.18	5.06	0.93	1.28	1.28	2.85	3.31
DN40	48.3	156	183	157	129	24	33	33	72	1.5
2	2.375	7.08	7.90	6.64	5.45	1.18	1.28	1.28	2.85	3.96
DN50	60.3	180	201	169	139	30	33	33	72	1.8

6.1 DIMENSIONS (CONTINUED)

Threaded Valve

Series 790V



Series 790V
 1/2 - 2"/DN15 - DN50

Size		Dimensions								Weight
Nominal	Actual Outside Diameter	A End to End	B End to Handle	C Port to Handle	D CL to Top	E CL to Bottom	F CL to Widest Edge Left	G CL to Widest Edge Right	H Handle Width	Approx. (Each)
1/2	0.840	3.09	4.96	5.49	3.97	0.52	1.28	1.28	2.85	0.91
DN15	21.3	78	126	139	101	14	33	33	72	0.4
3/4	1.050	3.47	5.28	5.68	4.14	0.64	1.28	1.28	2.85	1.07
DN20	26.9	88	134	144	106	17	33	33	72	0.5
1	1.315	4.11	5.66	5.89	4.25	0.80	1.28	1.28	2.85	1.27
DN25	33.7	104	144	150	108	21	33	33	72	0.6
1 1/4	1.660	4.69	6.14	5.56	4.72	0.98	1.28	1.28	2.85	2.02
DN32	42.4	119	156	141	120	25	33	33	72	0.9
1 1/2	1.900	5.31	6.79	6.14	5.06	1.15	1.28	1.28	2.85	3.31
DN40	48.3	135	172	156	129	30	33	33	72	1.5
2	2.375	5.90	7.42	6.64	5.45	1.37	1.28	1.28	2.85	3.96
DN50	60.3	150	188	169	139	35	33	33	72	1.8

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.



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.

Valve may be installed in any orientation.

Size		Flow Characteristics
Nominal inches DN	Actual Outside Diameter inches mm	Integrated Orifice Cv Kv
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_v Values for Valve at Various Hand Wheel Settings

Series 790V

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

Number of Turns	½ DN15 Cv Kv	¾ DN20 Cv Kv	1 DN25 Cv Kv	1 ¼ DN32 Cv Kv	1 ½ DN40 Cv Kv	2 DN50 Cv Kv
0.50	0.10	0.49	0.39	0.81	1.03	2.09
	0.09	0.42	0.34	0.70	0.89	1.81
1.00	0.44	0.84	1.13	2.57	3.97	4.22
	0.38	0.73	0.98	2.22	8.24	3.65
1.50	0.74	1.97	3.64	6.03	8.17	11.1
	0.64	1.70	3.15	5.22	12.5	9.58
2.00	1.10	2.86	5.46	9.19	13.2	18.1
	0.95	2.47	4.72	7.95	11.5	15.6
2.50	1.41	3.55	6.89	12.1	15.9	24.7
	1.22	3.07	5.96	10.5	13.8	21.4
3.00	1.92	4.74	8.15	14.4	19.7	30.5
	1.66	4.10	7.05	12.5	17.0	26.4
3.50	2.52	5.90	9.37	16.2	22.6	35.2
	2.18	5.10	8.11	14.0	19.6	30.4
4.00 ¹	3.09	6.54	10.1	17.4	25.2	39.5
	2.67	5.66	8.70	15.1	21.8	34.2

L = Low flow

¹ 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 Δp 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, Δp in Ft. of H₂O

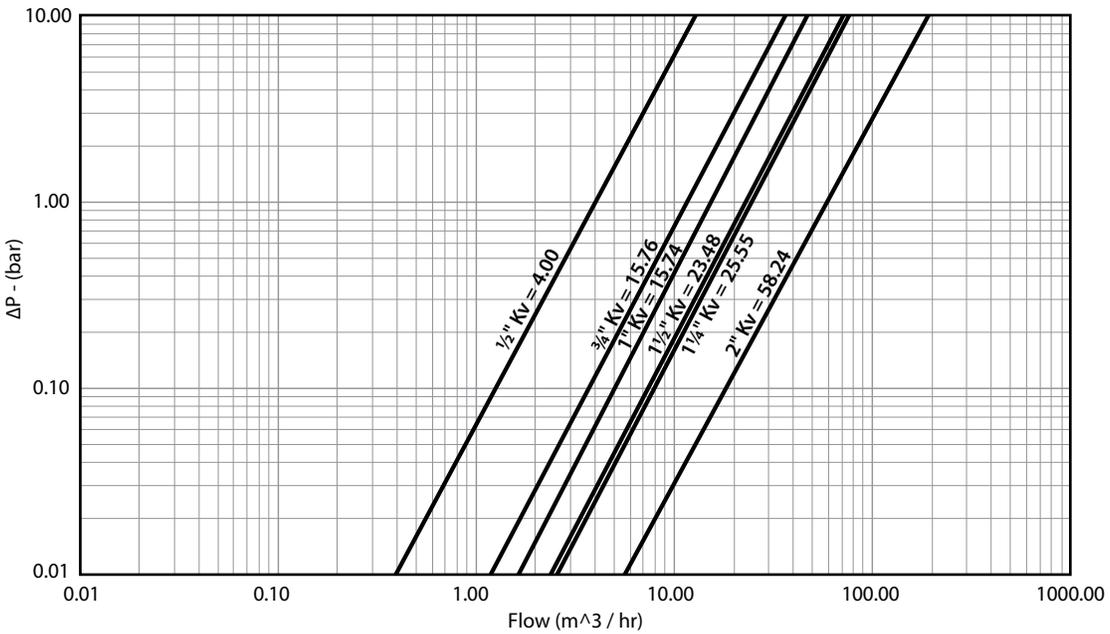
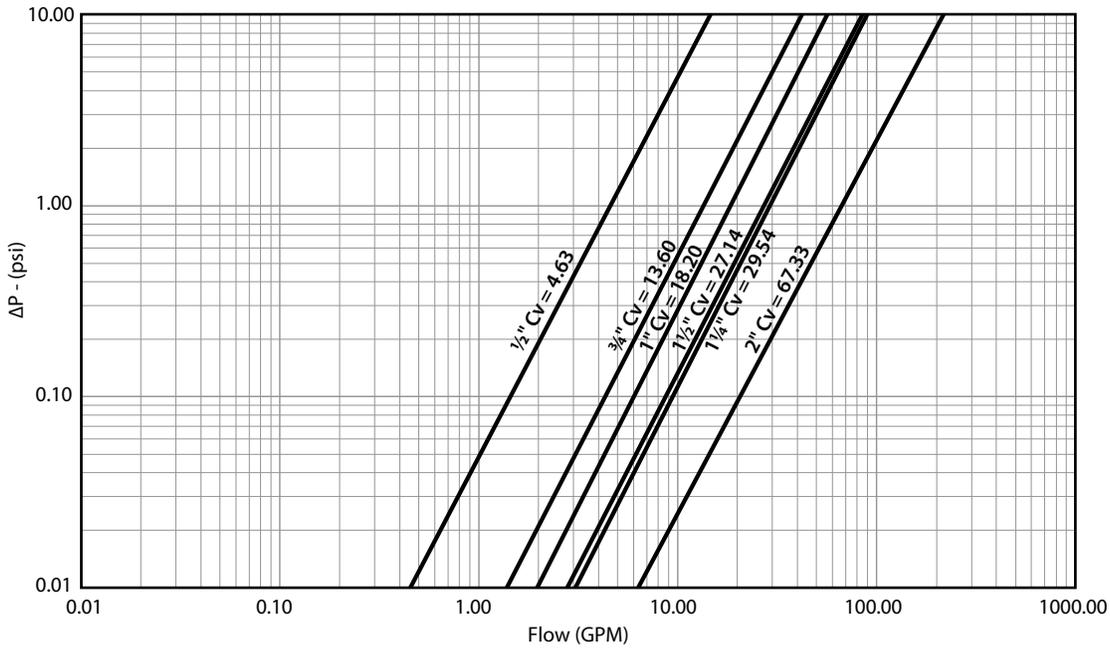
$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM, Δp in psi

NOTE:

- Suitable for water-glycol mixtures to 57%

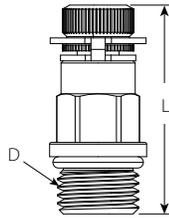
7.3 PERFORMANCE



7.4 PERFORMANCE

Accessories (Sold Separately)

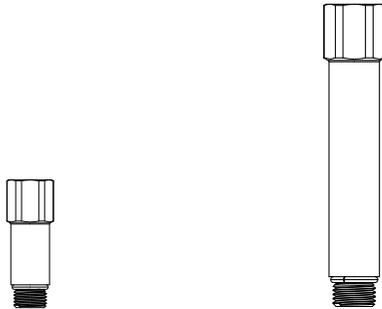
Replacement PT Ports



Size inches DN	L inches mm	D	Part Code
1/2 - 2 DN15 - DN50	1.75 45	9/16 SAE	P000790RPT (Red) ² P000790BPT (Blue) ²

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

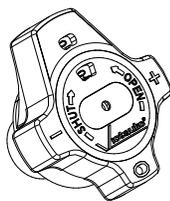
PT Port Extensions



2"/51 mm Extension Part Code	4"/102 mm Extension Part Code
P0007902PT ³	P0007904PT ³

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

Hand Wheel



Series 790V
Plastic
1/2 - 2"/DN15 - DN50

Part Code
P000787VHL

Memory Stop Hex Key

3-mm size for memory stop setting screw

Part Code
P000787V3M

7.0 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.

8.0 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](#)
- [106.03: Victaulic Series 788V Manual Balancing Valve](#)
- [106.04: Victaulic Series 789V Manual Balancing Valve](#)
- [106.05: Victaulic® Series 78KV 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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