Victaulic® Butterfly Valve
Series 250-C

1.0 PRODUCT DESCRIPTION

Available Sizes

- 2 – 8"/54.0 – 206.4mm.

Pipe Material

- Copper.

End Preparation

- Copper Tube System (CTS).

Maximum Working Pressure

- Accommodates pressures ranging from full vacuum (29.9 in Hg/760 mm Hg) up to 300psi/2069kPa/21bar.
- Full working pressure for bi-directional, dead end services.

NOTE

- Before start up, the test pressure may be increased to 1.1 times the maximum working pressure with disc closed, and 1.5 times with the valve in the open position. This is for a one-time system test and must be performed at ambient conditions.

Operating Temperature

- Dependent on seat selection from section 3.0.

Application

- For use in copper tubing systems; typical examples include potable water and HVAC, among others.

Actuation Options

- ISO 5211 mounting flange with ISO 5211 parallel square head drive.
- Lever Lock/10-position handle, padlockable.
- Gear operator.
- Accommodates up to 2"/50 mm of insulation.
- Chainwheel (requires gear operator).

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

2.0 CERTIFICATIONS/LISTINGS

- The Series 250-C is UL Classified in accordance with NSF/ANSI/CAN 61 and NSF/ANSI/CAN 372 up to a commercial hot water rating, +180°F/+82°C, when constructed with a Victaulic Fluoroelastomer blend seat.
- The Series 250-C is certified by IAPMO R&T in accordance with the UniformPlumbing Code (UPC) and MSS SP-67-2017.
- Meets requirements of ASME B16.34 Section 7 Pressure Testing.

3.0 SPECIFICATIONS – MATERIAL

Body: Ductile iron conforming to ASTM A536, Grade 65-45-12.

End Faces: Aluminum Bronze conforming to ASTM B763 C95500.

Body Coating:

☐ Standard: Copper color coating.

Disc: Aluminum Bronze conforming to ASTM B763 C95500.

Seat:

Victaulic Fluoroelastomer blend: Fluoroelastomer blend (Double blue stripe color code). Temperature range -10°F to 180°F/-23°C to 82°C. Specifically formulated for compatibility with potable water systems. Optimized for improved resistance to chlorine, chloramine and other typical potable water disinfectants. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372.
NOT RECOMMENDED FOR PETROLEUM SERVICES OR STEAM SERVICES.

Stem: 416 stainless steel conforming to ASTM A582.

☐ Optional: 17-4 PH stainless steel conforming to ASTM A564.

Bearings: Aluminum Bronze, ASTM B505 C95400 or C95410.

Stem Retaining Ring: 316 stainless steel.

Lever Lock/10-Position Handle

☐ Standard: Black painted ductile iron conforming to ASTM A536, Grade 65-45-12, with stainless steel plate and fasteners

Gear Operator (with options below):

☐ Handwheel.

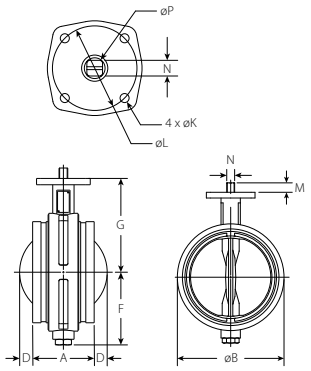
☐ Handwheel with chainwheel.

NOTE

- A padlockable valve refers to those valves which can be padlocked to lockout equipment for preventing inadvertent valve operation. When used in conjunction with an appropriate lockout/tagout system, multiple padlocks may be used. The valve may be padlocked either fully open or fully closed.

4.0 DIMENSIONS

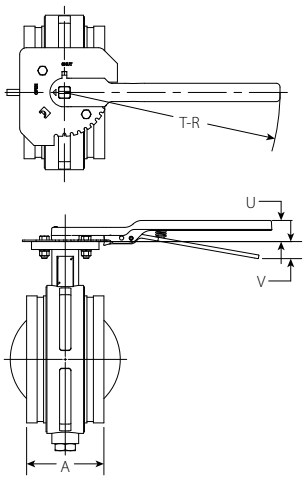
Series 250-CU Butterfly Valve - Bare Valve



Size		Dimensions										Approx. Weight (Each) lb kg	ISO 5211 Flange Designation
Nominal inches	**Actual Outside Diameter** inches mm	**A** **E to E** inches mm	**B** inches mm	**D** inches mm	**F** inches mm	**G** inches mm	**K** inches mm	**L** inches mm	**M** inches mm	**N** inches mm	**P** inches mm		
2	2.125 54	3.19 81	3.50 88	–	2.38 60	4.13 103	0.34 8.5	2.76 70	0.70 18	0.35 9	0.47 12	4.0 1.8	F07
2 ½	2.625 66.7	3.81 97	4.13 105	–	2.63 65	4.25 108	0.34 8.5	2.76 70	0.70 18	0.35 9	0.47 12	5.8 2.6	F07
3	3.125 79.4	3.81 97	4.88 122	–	3.13 78	4.75 121	0.34 8.5	2.76 70	0.70 18	0.43 11	0.56 14	7.5 3.4	F07
4	4.125 104.8	4.56 116	5.75 146	–	3.63 91	5.25 134	0.34 8.5	2.76 70	0.70 18	0.43 11	0.56 14	11.0 5.0	F07
6	6.125 155.6	5.81 148	8.00 201	0.13 1	5.13 129	6.75 172	0.34 8.5	2.76 70	0.85 22	0.55 14	0.71 18	24.0 11.0	F07
8	8.125 206.4	5.25 133	10.13 256	1.25 31	6.25 158	8.00 204	0.43 10.9	4.02 102	0.89 23	0.74 19	0.98 25	39.0 17.5	F10

4.1 DIMENSIONS

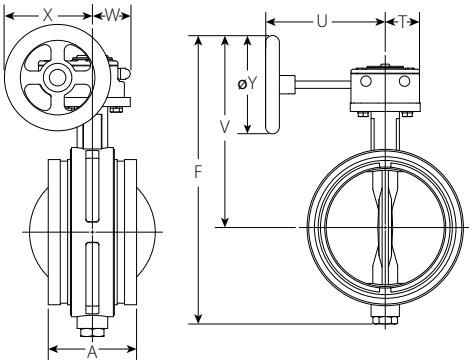
Series 250-CU Butterfly Valve - With Handle



Size		Dimensions				Approx. Weight (Each)
Nominal inches	**Actual Outside Diameter** inches mm	**A E to E** inches mm	**T-R** inches mm	**U** inches mm	**V** inches mm	lb kg
2	2.125 54	3.19 81	8.50 216	1.50 37	0.50 12	6.0 2.7
2 ½	2.625 66.7	3.81 97	8.50 216	1.50 37	0.50 12	7.9 3.6
3	3.125 79.4	3.81 97	8.50 216	1.50 37	0.50 12	9.5 4.3
4	4.125 104.8	4.56 116	8.50 216	1.50 37	0.50 12	13.0 5.9
6	6.125 155.6	5.81 148	12.00 305	1.50 37	1.00 25	27.0 12.0
8	8.125 206.4	5.25 133	14.13 357	1.50 37	1.25 30	43.0 19.5

4.2 DIMENSIONS

Series 250-CU Butterfly Valve - With Gear Operator



Size		Dimensions								Approx. Weight (Each)
Nominal inches	**Actual Outside Diameter** inches mm	**A E to E** inches mm	**F** inches mm	**T** inches mm	**U** inches mm	**V** inches mm	**W** inches mm	**X** inches mm	**Y** inches mm	lb kg
2	2.125 54	3.19 81	9.50 241	1.75 43	5.25 131	7.13 181	2.00 49	3.75 94	4.00 100	7.0 3.2
2 ½	2.625 66.7	3.81 97	9.88 251	1.75 43	5.25 131	7.38 186	2.00 49	3.75 94	4.00 100	8.7 3.9
3	3.125 79.4	3.81 97	11.00 277	1.75 43	5.25 131	7.88 199	2.00 49	3.75 94	4.00 100	11.0 5.0
4	4.125 104.8	4.56 116	12.00 302	1.75 43	5.25 131	8.38 212	2.00 49	3.75 94	4.00 100	14.0 6.4
6	6.125 155.6	5.81 148	15.50 393	2.25 57	7.38 185	10.50 264	2.25 58	4.63 116	5.00 125	29.0 13.0
8	8.125 206.4	5.25 133	18.63 471	2.25 57	7.75 195	12.38 314	2.25 58	5.25 133	6.38 160	43.0 19.5

4.3 DIMENSIONS

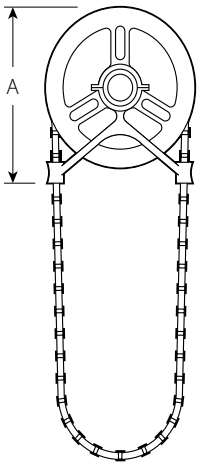
Accessories

Chainwheels

Chainwheels are mounted to the gear operator handwheels. Sprocket rim and guide arms are made of cast aluminum. Chain is galvanized steel weldless lock link chain.

Always specify length of chain required.

For insulation and locking device, contact Victaulic for details. Handwheel input shaft extensions are not for use with chainwheels.



Chainwheel and Guide with Safety Cable Kit

Size		Sprocket Size	Chain Trade Size	Dimensions		Approximate Weight (Each)
Nominal inches	Actual Outside Diameter inches mm			Chainwheel Size (Diameter) inches mm	A inches mm	lb kg
2 – 4	2.125 – 4.125 54 – 104.8	0	2	4.00 102	4.63 118	2.0 0.9
6	6.125 155.6	1	1/0	5.75 146	6.38 162	4.0 1.8
8	8.125 206.4	1½	1/0	7.50 191	7.75 197	5.0 2.3

5.0 PERFORMANCE

C_v/K_v values for flow of water at +60°F/+16°C with various disc positions are shown in the table below.

Formulas for C_v/K_v values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

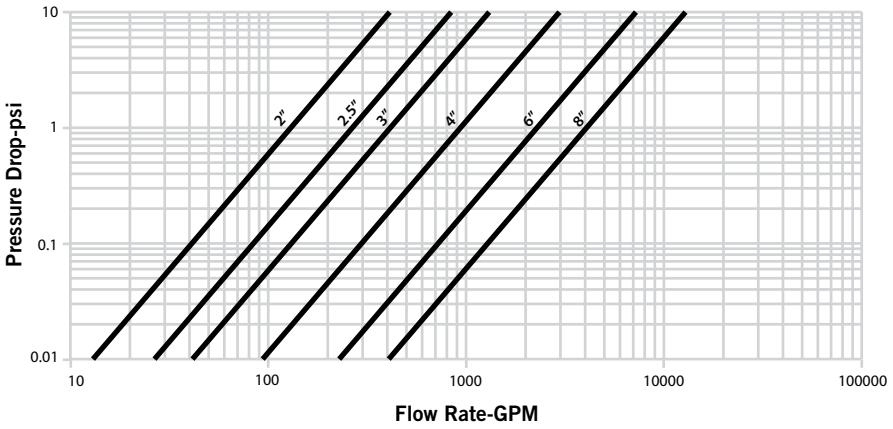
Size		Flow Characteristics
Nominal inches	**Actual Outside Diameter** inches mm	**(Full Open)** C_v K_v
2	2.125 54	131 113
2 ½	2.625 66.7	268 232
3	3.125 79.4	417 361
4	4.125 104.8	944 817
6	6.125 155.6	2301 1990
8	8.125 206.4	4096 3543

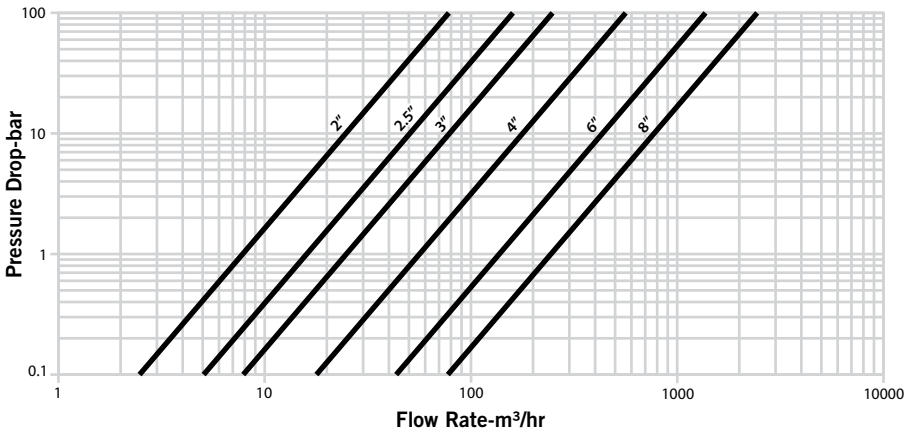
NOTE

- Victaulic recommends limiting the flow velocities for water service to 13.5 feet/second (4 meters/second).

5.0 PERFORMANCE (CONTINUED)

Flow Characteristics





5.0 PERFORMANCE (CONTINUED)

Size		Flow Coefficients – C_v/K_v						
		Disc Position (Degrees Open)						
		90	80	70	60	50	40	30
								
Nominal inches	**Actual Outside Diameter** inches mm	C_v K_v	C_v K_v	C_v K_v	C_v K_v	C_v K_v	C_v K_v	C_v K_v
2	2.125 54	131 113	103 89	56 48	31 26	16 14	9 8	6 5
2 ½	2.625 66.7	268 232	211 183	114 98	63 54	34 29	18 16	12 10
3	3.125 79.4	417 361	328 284	177 153	97 84	52 45	28 24	19 16
4	4.125 104.8	944 817	743 643	400 346	220 191	119 103	64 55	42 37
6	6.125 155.6	2301 1990	1812 1567	975 843	537 465	289 250	156 135	103 89
8	8.125 206.4	4096 3543	3226 2790	1735 1501	956 827	514 445	277 240	184 159

5.1 PERFORMANCE

Torque Requirements

Size		Torque – Inch Pounds/Newton Meters Differential Pressure – psi/bar					
inches	inches mm	50/3	100/7	150/10	200/14	250/17	300/20
2	2.125 54	52 6	64 7	69 8	78 9	82 9	166 19
2 ½	2.625 66.7	70 8	76 9	81 9	90 10	94 11	217 25
3	3.125 79.4	104 12	117 13	136 15	162 18	179 20	402 45
4	4.125 104.8	125 14	155 18	186 21	227 26	253 29	434 49
6	6.125 155.6	307 35	400 45	510 58	624 71	722 82	1150 130
8	8.125 206.4	517 58	691 78	893 101	1128 127	1241 140	2196 248

Source:

These torque values were derived from test data with valves in water at ambient temperatures with Fluoroelastomer blend seals. For other material and service conditions, apply a suitable service factor.

Torque Factors:

All torque values are for normal conditions (i.e., the valve is operated at least once a quarter, disc corrosion is expected to be minor, the media is clean and nonabrasive, and the chemical effects upon the elastomer are minor).

Typical Fluid Torque Factors Commonly Used in the Industry:

Water: 1.0

Material Torque Factors:

Fluoroelastomer blend = 1.0

Cycling Factor:

Valve torque will typically increase and actuator output decrease as the valve is cycled. A factor of 1.5 should be applied for when total valve cycles are expected to exceed 5,000.

Actuation Factor:

A factor should be added to account for potential drift in the output of the actuator due to actuator performance, misalignment or external inputs (i.e., air or power supply). For this, a factor of up to 1.25 may be used.

Combining Torque Factors:

When multiple torque factors apply, they are combined by multiplying them. Example: For a Fluoroelastomer blend seal and a 5,000-cycle factor, the combined factor would be 1.0 X (1.5) = 1.5.

NOTES

- Under certain high flow conditions, the hydrodynamic torque can exceed the seating torque. Large butterfly valves are not recommended for use in a free discharge condition, such as filling an empty line with fluid at the full-rated pressure.
- Contact Victaulic for other services.

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install any Victaulic piping 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 maitenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

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

7.0 REFERENCE MATERIALS

I-100: Victaulic Field Installation Handbook

I-250: Installation and Maintenance Instructions - Series I-250 Butterfly Valve

I-600: Field Installation Handbook

I-ENDCAP: Victaulic End Cap Installation Safety Instructions

