Victaulic® Butterfly Valve
Series 250-S

1.0 PRODUCT DESCRIPTION

Available Sizes

- 2 – 8"/DN50 – DN200.

Pipe Material

- Stainless Steel Pipe.

End Preparation

- Victaulic Original Groove System (OGS).

Maximum Working Pressure

- Accommodates pressures ranging from full vacuum (29.9 in Hg/760 mm Hg) up to 250psi/1724kPa/17bar for S250-S4.
- 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

- Use on systems where stainless steel piping is required; typical examples include potable water, technical cooling water, and HVAC, among others.

Actuation Options

- ISO 5211 mounting flange with ISO 5211 parallel square head drive.
- 10-position handle, padlockable.
- Gear operator.
- Accommodates 2"/50 mm of insulation.
- Chainwheel.

2.0 CERTIFICATION/LISTINGS

Valve construction and performance meet or exceed MSS-SP-67 requirements.

Compliant with Closure/Seat Leakage Rate A per EN 12266-1, EN 1074-1, EN 1074-2 and ISO 5208.

Meets requirements of ASME B16.34 Section 7 Pressure Testing and ASME B16.42 Section 8.1 Wall Thickness.

3.0 SPECIFICATIONS – MATERIAL

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

End Faces: Stainless steel conforming to ASTM A351 Grade CF8/ASTM A473 UNS S30400.

Body Coating:

☐ Standard: Blue coating.

Disc: Stainless steel conforming to ASTM A351 Grade CF8/ASTM A473 UNS S30400.

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.

10 Position Handle:

☐ Handle: Ductile iron conforming to ASTM A536, Grade 65-45-12, black coated. Plate: Carbon Steel, Zinc plated.

Gear Operator (with options below):

☐ Handwheel.

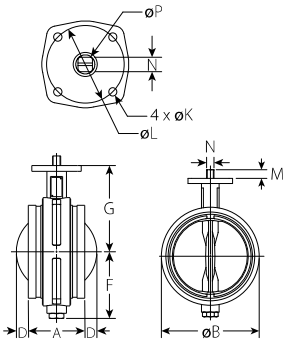
☐ Handwheel with chainwheel.

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

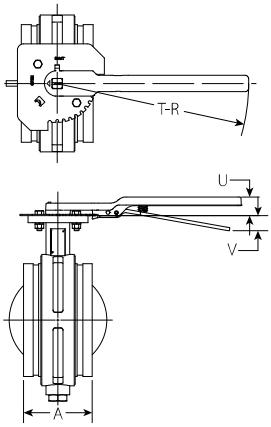
Series 250-S4 Butterfly Valve - Bare Valve



Size		Dimensions										Approx. Weight (Each) lb kg	ISO 5211 Flange Designation
Nominal inches DN	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 (sq) inches mm	P inches mm		
2 DN50	2.375 60.3	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	4.1 1.9	F07
2 ½	2.875 73.0	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	6.1 2.8	F07
3 DN80	3.500 88.9	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	7.7 3.5	F07
4 DN100	4.500 114.3	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 DN150	6.625 168.3	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 DN200	8.625 219.1	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

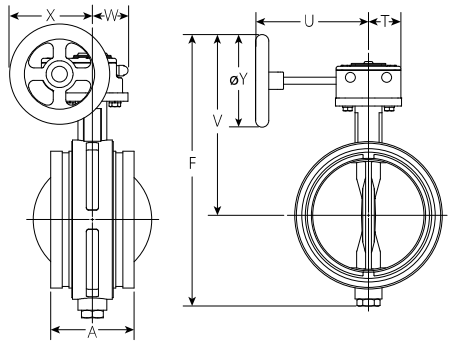
Series 250-S4 Butterfly Valve - With Handle



Size		Dimensions				Approx. Weight (Each)
Nominal inches DN	**Actual Outside Diameter** inches mm	**A** **E to E** inches mm	**T-R** inches mm	**U** inches mm	**V** inches mm	lb kg
2 DN50	2.375 60.3	3.19 81	8.50 216	1.50 37	0.50 12	6.1 2.8
2 ½	2.875 73.0	3.81 97	8.50 216	1.50 37	0.50 12	8.2 3.7
3 DN80	3.500 88.9	3.81 97	8.50 216	1.50 37	0.50 12	9.7 4.4
4 DN100	4.500 114.3	4.56 116	8.50 216	1.50 37	0.50 12	13.0 5.9
6 DN150	6.625 168.3	5.81 148	12.00 305	1.50 37	1.00 25	27.0 12.0
8 DN200	8.625 219.1	5.25 133	14.13 357	1.50 37	1.25 30	43.0 19.5

4.2 DIMENSIONS

Series 250-S4 Butterfly Valve - With Gear Operator



Size		Dimensions								Approx. Weight (Each)
Nominal inches DN	**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 DN50	2.375 60.3	3.19 81	9.50 240	1.75 43	5.25 133	7.13 180	2.00 49	3.75 93	4.00 100	7.1 3.2
2 ½	2.875 73.0	3.81 97	9.88 250	1.75 43	5.25 133	7.38 185	2.00 49	3.75 93	4.00 100	9.0 4.1
3 DN80	3.500 88.9	3.81 97	10.88 277	1.75 43	5.25 133	7.88 198	2.00 49	3.75 93	4.00 100	11.0 5.0
4 DN100	4.500 114.3	4.56 116	11.88 301	1.75 43	5.25 133	8.38 211	2.00 49	3.75 93	4.00 100	14.0 6.4
6 DN150	6.625 168.3	5.81 148	15.50 393	2.25 57	7.38 185	10.50 264	2.25 58	4.63 117	5.00 127	29.0 13.0
8 DN200	8.625 219.1	5.25 133	19.25 489	2.25 57	7.88 198	13.13 332	2.25 58	6.00 151	6.38 162	43.0 19.5

4.3 DIMENSIONS

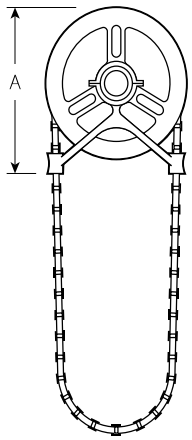
Accessories

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		Approx. Weight (Each)
Nominal inches DN	**Actual Outside Diameter** inches mm	**Sprocket Size**	**Chain Trade Size**	**Chainwheel Size (Diameter)** inches mm	**A** inches mm	lb kg
2 – 4 DN50 – DN100	2.375 – 4.500 60.3 – 114.3	0	2	4.00 102	4.63 118	2.0 0.9
6 DN150	6.625 168.3	1	1/0	5.75 146	6.38 162	4.0 1.8
8 DN200	8.625 219.1	1½	1/0	7.50 190	7.75 197	5.0 2.3

5.0 PERFORMANCE

Series 250-S4 Butterfly Valve

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

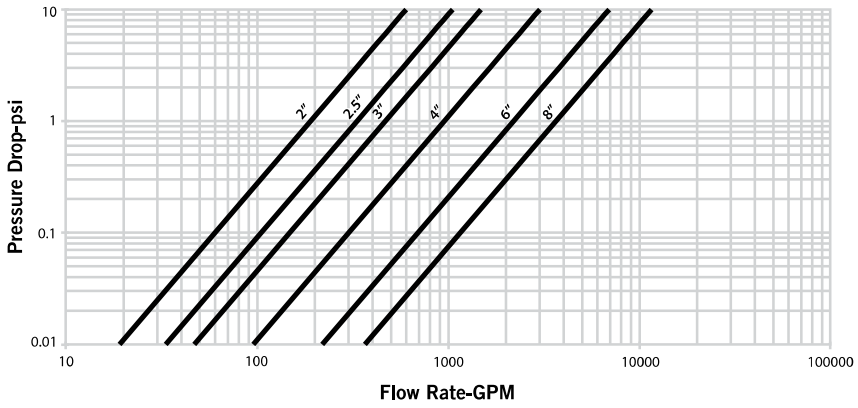
Size		C_v/K_v Values
Nominal inches DN	**Actual Outside Diameter** inches mm	**(Full Open)** C_v K_v
2 DN50	2.375 60.3	190 164
2½	2.875 73.0	332 287
3 DN80	4.500 114.3	468 405
4 DN100	6.625 168.3	950 822
6 DN150	6.625 168.3	2187 1892
8 DN200	8.625 219.1	3650 3157

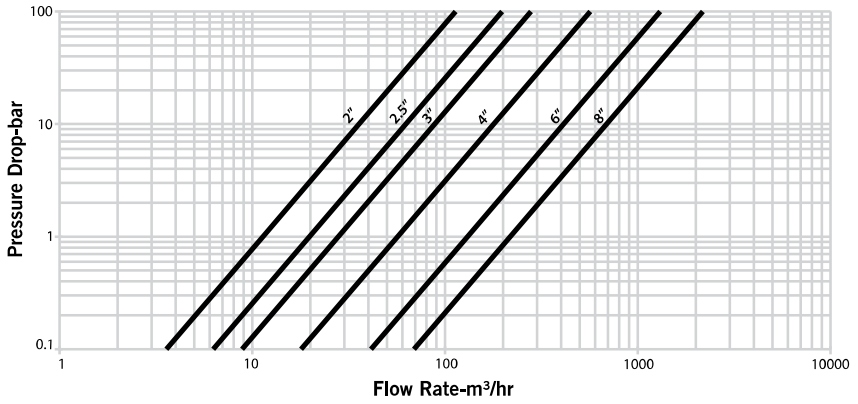
NOTE

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

5.0 PERFORMANCE (CONTINUED)

Flow Characteristics Series 250-S4





5.0 PERFORMANCE (CONTINUED)

Series 250-S4 Butterfly Valve

Size		Flow Coefficients – C_v/K_v						
		Disc Position (Degrees Open)						
		90	80	70	60	50	40	30
								
Nominal inches DN	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 DN50	2.375 60.3	190 164	154 133	94 81	55 48	33 29	19 16	10 9
2 ½	2.875 73.0	332 287	269 233	164 142	97 84	57 49	33 29	18 16
3 DN80	3.500 88.9	468 405	379 328	232 201	136 118	80 69	46 40	25 22
4 DN100	4.500 114.3	950 822	770 666	470 407	277 240	163 141	94 81	50 43
6 DN150	6.625 168.3	2187 1892	1772 1533	1083 937	636 550	375 324	216 187	115 99
8 DN200	8.625 219.1	3650 3157	2958 2559	1807 1563	1062 919	625 541	360 311	193 167

5.1 PERFORMANCE

Torque Requirements

Series 250-S4 Butterfly Valve

Size		Torque – Inch Pounds/Newton Meters				
		Differential Pressure – psi/bar				
inches DN	inches mm	**50/3** in/lb N/m	**100/7** in/lb N/m	**150/10** in/lb N/m	**200/14** in/lb N/m	**250/17** in/lb N/m
2 DN50	2.375 60.3	52 6	64 7	69 8	78 9	82 9
2 ½	2.875 73.0	70 8	76 9	81 9	90 10	94 11
3 DN80	3.500 88.9	104 12	117 13	136 15	162 18	179 20
4 DN100	4.500 114.3	125 14	155 18	186 21	227 26	253 29
6 DN150	6.625 168.3	270 31	343 39	428 48	504 57	573 65
8 DN200	8.625 219.1	517 58	691 78	893 101	1128 127	1241 140

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.

5.1 PERFORMANCE (CONTINUED)

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, remove, adjust, or maintain any Victaulic piping products.**
- **Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping 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 250 Butterfly Valve

I-ENDCAP: Victaulic End Cap Installation Safety Instructions

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