

Victaulic® Butterfly Valve

Series 250-S



1.0 PRODUCT DESCRIPTION

Available Sizes

- 2 – 12"/DN50 – DN300

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 300 psi/2068 kPa/21 Bar for Series 250-S4 (2 – 8"/DN50 – DN200).
- Accommodates pressures ranging from full vacuum (29.9 in Hg/760 mm Hg) up to 250 psi/1724 kPa/17 Bar for Series 250-S4 (10 – 12"/DN250 – DN300).
- 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, technology cooling water, and HVAC, among others.

Actuation Options

- ISO 5211 mounting flange with ISO 5211 parallel square head drive
- Lever Lock/10-position handle (2 – 8"/DN50 – DN200), padlockable
- Gear operator (2 – 12"/DN50 – DN300)
- Accommodates up to 2"/50 mm of insulation
- Chainwheel (requires gear operator)

NOTE

- The lever lock/10-position handle has a 0.29"/7.25-mm diameter lockout opening that can accommodate a variety of industrial padlocks constructed with either solid metal or cable shackles. The padlock's shackle should have a diameter of 0.24"/6 mm and a recommended length between 3.00 – 3.35"/76 – 85 mm. The valve may be padlocked in either the fully open or fully closed position to help prevent inadvertent valve operation.

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



2.0 CERTIFICATIONS/LISTINGS



- The Series 250-S4 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-S4 is certified by IAPMO R&T in accordance with the Uniform Plumbing Code (UPC) and MSS SP-67-2017 in sizes 2 – 12"/DN50 – DN300.
- 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: 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

Gland Nut (sizes 10 – 12"/DN250 – DN300): Aluminum Bronze ASTM B505 C95400 or C95410

Stem Retaining Ring (sizes 2 – 8"/DN50 – DN200): 316 stainless steel

Lever Lock/10-Position Handle (sizes 2 – 8"/DN50 – DN200):

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

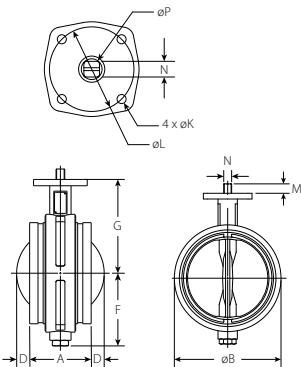
Gear Operator (with options below):

☐ Handwheel

☐ Handwheel with chainwheel

4.0 DIMENSIONS

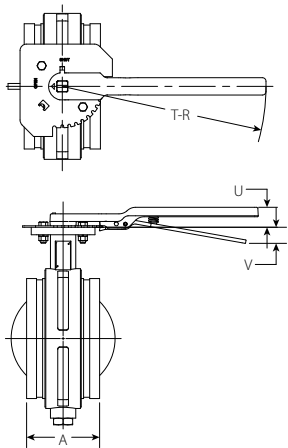
Series 250-S4 Butterfly Valve - Bare Valve



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
10 DN250	10.750 273.0	6.25 159	12.75 323	2.00 49	7.75 197	9.88 250	0.43 10.9	4.02 102	1.00 25	0.86 22	1.10 28	75.0 34.0	F10
12 DN300	12.750 323.9	6.50 165	14.75 374	2.75 70	8.75 221	10.75 274	0.43 10.9	4.02 102	1.00 25	0.86 22	1.10 28	101.0 46.0	F10

4.1 DIMENSIONS

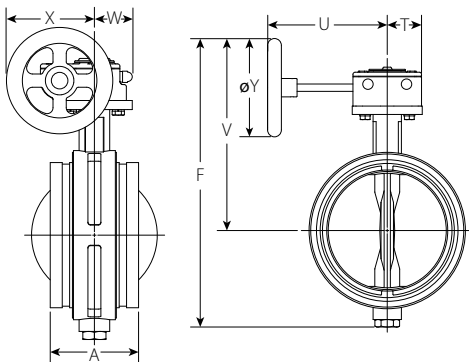
Series 250-S4 Butterfly Valve - With Lever Lock/10-Position Handle



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	
2	2.375	3.19	8.50	1.50	0.50	6.1
DN50	60.3	81	216	37	12	2.8
2 ½	2.875	3.81	8.50	1.50	0.50	8.2
	73.0	97	216	37	12	3.7
3	3.500	3.81	8.50	1.50	0.50	9.7
DN80	88.9	97	216	37	12	4.4
4	4.500	4.56	8.50	1.50	0.50	13.0
DN100	114.3	116	216	37	12	5.9
6	6.625	5.81	12.00	1.50	1.00	27.0
DN150	168.3	148	305	37	25	12.0
8	8.625	5.25	14.13	1.50	1.25	43.0
DN200	219.1	133	357	37	30	19.5

4.2 DIMENSIONS

Series 250-S4 Butterfly Valve - With Gear Operator



Size		Dimensions								Approx. Weight (Each)
Nominal	Actual Outside Diameter	A E to E	F	T	U	V	W	X	Y	
inches DN	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	inches mm	lb kg
2	2.375	3.19	9.50	1.75	5.25	7.13	2.00	3.75	4.00	7.1
DN50	60.3	81	241	43	131	181	49	94	100	3.2
2 ½	2.875	3.81	9.88	1.75	5.25	7.38	2.00	3.75	4.00	9.0
	73.0	97	251	43	131	186	49	94	100	4.1
3	3.500	3.81	11.00	1.75	5.25	7.88	2.00	3.75	4.00	11.0
DN80	88.9	97	277	43	131	199	49	94	100	5.0
4	4.500	4.56	12.00	1.75	5.25	8.38	2.00	3.75	4.00	14.0
DN100	114.3	116	302	43	131	212	49	94	100	6.4
6	6.625	5.81	15.50	2.25	7.38	10.50	2.25	4.63	5.00	29.0
DN150	168.3	148	393	57	185	264	58	116	125	13.0
8	8.625	5.25	18.63	2.25	7.75	12.38	2.25	5.25	6.38	43.0
DN200	219.1	133	471	57	195	314	58	133	160	19.5
10	10.750	6.25	23.00	2.88	9.00	15.38	3.13	6.38	7.88	85.0
DN250	273.0	159	584	73	228	388	79	160	200	38.5
12	12.750	6.50	24.88	2.88	9.00	16.25	3.13	6.38	7.88	115.0
DN300	323.9	165	632	73	228	412	79	160	200	52.0

4.3 DIMENSIONS

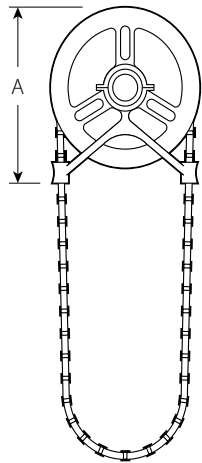
Accessories

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) lb kg
Nominal inches DN	Actual Outside Diameter inches mm			Chainwheel Size (Diameter) inches mm	A inches mm	
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	7.50 191	7.75 197	5.0 2.3
10 – 12 DN250 – DN300	10.750 – 12.750 273.0 – 323.9	2	1/0	9.00 229	10.50 267	10.0 4.5

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 (m³/hr)

ΔP = Pressure Drop (Bar)

K_v = Flow Coefficient

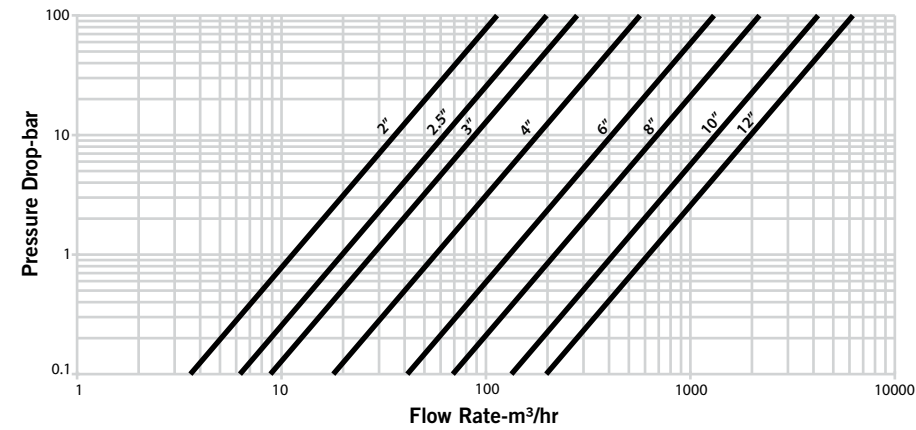
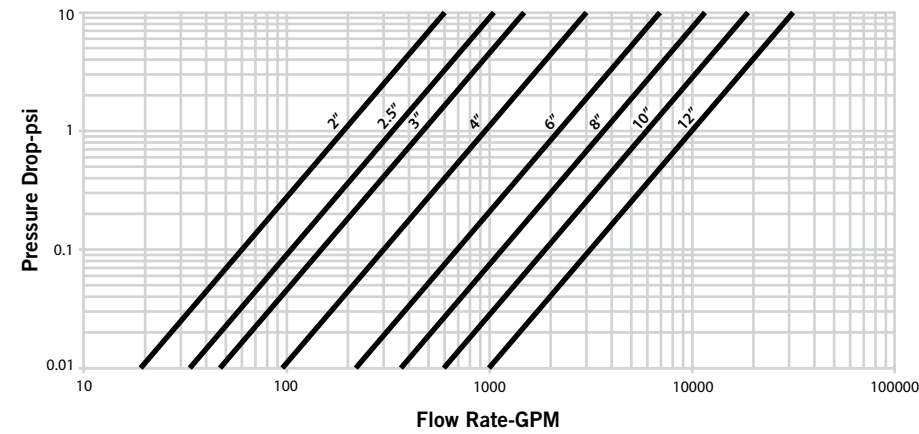
Size		Flow Characteristics
Nominal inches DN	Actual Outside Diameter inches mm	(Full Open) C _v K _v
2 DN50	2.375 60.3	190 164
2 ½	2.875 73.0	332 287
3 DN80	3.500 88.9	468 405
4 DN100	4.500 114.3	950 822
6 DN150	6.625 168.3	2187 1892
8 DN200	8.625 219.1	3650 3157
10 DN250	10.750 273.0	6794 5877
12 DN300	12.750 323.9	10411 9006

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)						
Nominal inches DN	Actual Outside Diameter inches mm	90	80	70	60	50	40	30
								
		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
10 DN250	10.750 273.0	6794 5877	5505 4762	3363 2909	1977 1710	1164 1007	669 579	358 310
12 DN300	12.750 323.9	10411 9006	8436 7297	5153 4457	3030 2621	1784 1543	1026 887	549 475

5.1 PERFORMANCE

Torque Requirements

Series 250-S4 Butterfly Valve

Size		Torque – Inch Pounds/Newton Meters
		Differential Pressure – psi/Bar
inches DN	inches mm	300/20
2 DN50	2.375 60.3	166 19
2 ½	2.875 73.0	217 25
3 DN80	3.500 88.9	460 52
4 DN100	4.500 114.3	531 60
6 DN150	6.625 168.3	1150 130
8 DN200	8.625 219.1	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 $1.0 \times (1.5) = 1.5$.

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 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.

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](#)

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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