SIEMENS

Technical Instructions
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Resilient Seat Butterfly Valves



Description

Designed to last longer with minimal downtime, Siemens resilient seat butterfly valves are available in sizes from 2 to 24 inches (DN 50 to 600) built with the highest temperature and chemical resistance available in the market.
Available in 2-way and 3-way configurations, 2” through 20” butterfly valves are lug style. 24” valves are double-flanged. All have ANSI 125 rated bodies. 3-way valves can be used for mixing and diverting applications and are available in multiple configurations to match job site needs.
These valves are compatible with Siemens A-Series Industrial Electric, and OpenAir® Commercial Electric actuators. A-Series actuators are fail-in-place and available for two-position (On/Off) and Modulating control. OpenAir actuators are available in both spring return and non-spring return variants for two-position (On/Off), Floating and Modulating control.
Resilient seat butterfly valves provide bubble-tight shut off (leakage class better than ANSI Class VI) up to 175 PSI (Full Cut) and 50 PSI (Under Cut) requirements.

Features

- High purity, peroxide cured, high temperature EPDM seats to ensure continuous operation at 250°F (121°C)
- Corrosion-resistant, 316 Stainless Steel disc (2” through 12”)
- Corrosion-resistant Electroless Nickel Plated Ductile Iron (14” through 24”)
- Internal disc-to-stem connection to eliminate leakage through the stem
- Wide variety of direct mount actuators.
- Full 175 PSI and 50 PSI close-off pressure ratings available.

Application

Siemens Resilient Seat butterfly valves are suitable for standard temperature (intermittent 250°F) or high temperature applications (continuous 250°F). Standard temperature assemblies can be field upgraded to high temperature at any time by updating the actuator. There is no need to remove the valve from the piping.

These valves can be used for isolation purposes or as modulating valves. Siemens butterfly valves are optimized for use in Chilled Water, Hot Water and Open Loop Cooling Tower applications.

Caution and Warning Notations

WARNING:	⚠	Personal injury or loss of life may occur if you do not perform a procedure as specified.
CAUTION:	⚠	Equipment damage may occur if you do not perform a procedure as specified.

Product Numbers

See Table 5.

Specifications

Material	Body	ASTM A126 Class B Cast Iron
	Disc for sizes 2”-12”	316 Stainless Steel
	Disc for sizes 14” and above	Electroless Nickel Plated Ductile Iron
	Seat	High purity, peroxide-cured, high temperature EPDM
	Stem	416 Stainless Steel
	Stem Bearing	Heavy Duty Acetal
	Packing	Nitrile Butadiene Rubber (NBR)
	Tee	Ductile Iron (3-Way valves only)
Operating	Body cold working pressure rating	250 psi (17.2 bar)
	Media temperature	-20 to 250°F [continuous] (-28 to 121°C)
	Controlled medium	Hot water, chilled water, condenser water up to 50% Glycol
	Flow characteristic	Modified equal percentage
	Flow Coefficients	Table 1.
	Close-off (for electric actuator assemblies only)	2” to 12”, 175 PSI. full cut 14” to 24”, 150 PSI, full cut 50 PSI dead end service, full cut 50 PSI, all under cut discs
	Angle of rotation	0° to 90°
	Leakage	Bubble tight at 175 PSI close-off (better than ANSI class VI)
	Maximum fluid velocity	30 feet/second (9 m/second)
	Max recommended differential pressure with flow	29 psi (2 bar)
Size range	2-inch through 24-inch (DN 50 to 600)	
Body style	Lug (2” through 20”) or double flange (24”), 2-way and 3-way, ANSI 125 rated	
Miscellaneous	Dimensions, service envelope, weight	See Tables 5 and 6 and Figures 2 - 5
	Agency Certification (for actuators)	UL Meets UL 873 cUL Certified to Canadian Standard C22.2 No. 24.93 CE European standard
	Agency Certification (for valves)	SIL CRN 0C0288.5ADD16 (Siemens 2-way Butterfly Valves B2))
	NOTE: Siemens 3-way butterfly valves (B3) consist of two 2-way butterfly valves (B2) on a tee section.	

NOTE:
These performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult your local Siemens office. Siemens, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

Accessories/Kits

599-10083	Bracket for GCA/GIB 2-way, 2” to 4” valves
599-10084	Bracket for GCA/GIB 2-way valves, dual actuators
599-10085	Bracket for GCA/GIB 2-way, 5" under cut valves
599-10086	Bracket for GCA/GIB 3-way valves
599-10087	Bracket for GCA/GIB 3-way valves dual 2” and 3” actuators
599-10089	Bracket for GCA/GIB 3-way, 4" under cut valves
599-10090	Bracket for GCA/GIB 3-way 5", 6" under cut valves, dual actuators
599-10097LT	120V Servo NXT Kit A-Series 600 to 6.5K lb-in actuators
599-10097HT	120V Servo NXT Kit for A-Series 13K and 18K lb-in actuators
599-10098	24V Servo NXT Kit A-Series 600 to 5K lb-in actuators

Flow Direction

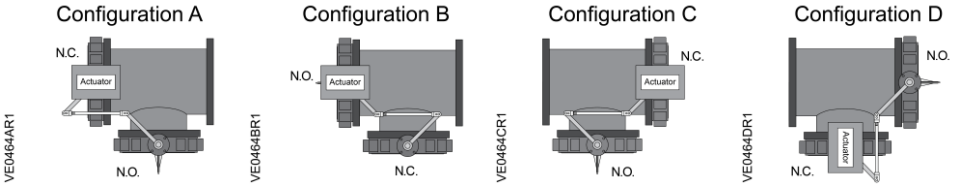


Figure 1. Typical Three-Way Valve Configurations.

Table 1. Cv at Opening Angles, Two-Way Valves.

Valve Size (Inches)	Disc Opening Angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	1	7	16	27	43	61	84	114	144
2.5	1.5	11	24	43	67	107	163	223	282
3	2	15	35	61	96	154	267	364	461
4	3	27	62	109	171	274	496	701	841
5	5	43	98	170	268	428	775	1,146	1,376
6	6	56	129	225	354	567	1,025	1,542	1,850
8	12	102	241	421	680	1,081	1,862	2,842	3,316
10	19	162	382	667	1,076	1,710	2,948	4,525	5,430
12	27	353	555	1,005	1,594	2,563	4,393	6,731	8,077
14	34	299	756	1,320	2,149	3,384	5,939	9,974	10,538
16	45	397	1,001	1,749	2,847	4,483	7,867	11,761	13,966
18	58	507	1,281	2,237	3,643	5,736	10,062	14,496	17,214
20	72	632	1,595	2,786	4,536	7,144	12,535	1,812	22,339
24	259	1,028	2,387	4,244	6,962	11,040	18,235	27,186	33,154

Ordering

Order butterfly assemblies, standalone actuators, and mounting kits separately.

Time-Out Function

To prolong Commercial actuator life when using Floating Control (3 Point), a controller with a “time-out” function must be used. This function removes the actuator drive signal after the signal has been on for a pre-defined time.

Actuator Product Numbers

Table 2. A-Series Industrial Electric Actuators, 24V.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A126.530	On/Off	24 Vac	530	60	31 sec. AC 40 sec. DC	1.00	1.7
A126.600			600	68	60 sec. AC 40 sec. DC	1.80	--
A126.2K			2,000	226	60 sec.	2.00	--
A126.5K			5,000	565	60 sec.	4.00	--
A166.530	Modulating	24 Vac	530	60	31 sec.	1.00	1.7
A166.600			600	68	60 sec.	1.80	--
A166.2K			2,000	226	60 sec.	2.00	--
A166.5K			5,000	565	60 sec.	4.00	--

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.

Table 3. A-Series Industrial Electric Actuators, 120V.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time*	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
A226.530	On/Off	120 Vac	530	60	31 sec.	0.20	0.34
A226.600			600	68	30 sec.	0.80	1.00
A226.1K			1,200	135	30 sec.	0.78	2.10
A226.2K			2,000	226	30 sec.	1.00	2.10
A226.3K			3,000	339	30 sec.	1.20	3.00
A226.5K			5,000	565	30 sec.	1.60	3.00
A226.6K			6,500	734	30 sec.	2.30	3.10
A226.13K			13,000	1,470	110 sec.	2.30	3.10
A226.18K			18,000	2,034	110 sec.	2.50	3.10
A226.21K			21,300	2,406	60 sec.	6.50	14.00
A226.41K			40,680	4,596	60 sec.	6.50	14.00
A266.530	Modulating	120 Vac	530	60	31 sec.	0.20	0.34
A266.600			600	68	30 sec.	0.80	1.00
A266.1K			1,200	135	30 sec.	0.78	2.10
A266.2K			2,000	226	30 sec.	1.00	2.10
A266.3K			3,000	339	30 sec.	1.20	3.00
A266.5K			5,000	565	30 sec.	1.60	3.00
A266.6K			6,500	734	30 sec.	2.30	3.10
A266.13K			13,000	1,470	110 sec.	2.30	3.10
A266.18K			18,000	2,034	110 sec.	2.50	3.10
A266.21K			21,300	2,406	60 sec.	6.50	14.00
A266.41K			40,680	4,496	60 sec.	6.50	14.00

* Operating times shown are with 60 Hz power supply. Actuators with 50 Hz power supply will be 20% slower.

Table 4. Commercial Actuators.

Product Number	Operating Mode	Voltage 50/60 Hz	Torque		90° Stroke Time (Seconds)	Current Draw (Amps)	
			(lb-in)	(Nm)		Full Load	Locked Rotor
GCA121.3U	On/Off	24 Vac/dc	160	18	90 (15 with Spring Return)	7 Va	5 Va
GCA126.3U						7 Va	5 Va
GCA161.3U	Modulating					7 Va	5 Va
GCA221.3U	On/Off	120 Vac				8 Va	6 Va
GIB131.3U	Floating	24 Vac	310	35	125	7 Va	7 Va*
GIB161.3U	Modulating					7 Va	7 Va*

***CAUTION:**

It is recommended to switch off the power during two-position control when the actuator has reached the open or closed position to enhance life span and reduce power consumption.

Ordering a Valve/Actuator Assembly

Use the product numbers in the following table to order a valve or a valve and actuator assembly. The valve product number consists of the type, action, valve size, disc type, and valve configuration.

To order an assembly, add a (-) after the valve product number and then choose the application, actuator, voltage, control signal, end switches followed by a separator (.) and the actuator torque.

Table 5. Product Numbers.

Sample:	B	2	02	F	C	-	S	A	1	2	6	.	530

Valve Type:
Butterfly

Action:
2 = 2-Way
3 = 3-Way

Valve Size:
02=2", 25=2.5", 03=3", 04=4",
05=5", 06=6", 08=8" 10=10",
12=12", 14=14", 16=16",
18=18", 20=20", 24=24"

Disc Type:
F = Full Cut
U = Under Cut

Valve Configuration:
3-Way - A, B, C, D
2-Way
O = Normally Open
C = Normally Closed
M = Valve assembly with manual operator

Denotes Assembly

Application:
S = Standard Temp – Intermittent 250°F Operation
H = High Temperature – Continuous 250°F Operation
Blank = Siemens Commercial Actuator

Actuator:
A = Industrial Actuator
GCA = Siemens SR Commercial Actuator
GIB = Siemens NSR Commercial Actuator

Voltage:
1 = 24V
2 = 120V

Control Signal:
2 = 2-Position
3 = Floating (Commercial Actuators only)
6 = Modulating (0-10V)

End Switches:
1 = No switches
6 = Switches

Separator

Actuator Torque (lb-in):
530=530, 600=600, 1K=1200, 2K=2000, 3K=3000, 5K=5000, 6K=6500,
13K=13000, 18K=18000, 21K=21300, 41K=40680, 3U = Shaft adapter with 3-foot cable
(Commercial Actuators only)

Table 6. Two-Way, Full Cut, 24V with Industrial Actuators Assemblies.

Valve Size (inch)	0 to 10V/4 to 20 mA			Two-Position		
2-Way, Full Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
2	A166.530	B202Fx-HA166.530	B202Fx-SA166. 530	A126.530	B202Fx-HA126.530	B202Fx-SA126.530
2.5		B225Fx-HA166.530	B225Fx-SA166. 530		B225Fx-HA126.530	B225Fx-SA126.530
3		B203Fx-HA166.530	B203Fx-SA166. 530		B203Fx-HA126.530	B203Fx-SA126.530
4		B204Fx-HA166.530	B204Fx-SA166. 530		B204Fx-HA126.530	B204Fx-SA126.530
5	A166.530	--	B205Fx-SA166. 530	A126.530	--	B205Fx-SA126.530
	A166.2K	B205Fx-HA166.2K	--	A126.2K	B205Fx-HA126.2K	--
6	A166.2K	B206Fx-HA166.2K	--	A126.2K	B206Fx-HA126.2K	--
	A166.600	--	B206Fx-SA166.600	A126.600	--	B206Fx-SA126.600
8	A166.2K	B208Fx-HA166.2K	B208Fx-SA166.2K	A126.2K	B208Fx-HA126.2K	B208Fx-SA126.2K
10	A166.5K	B210Fx-HA166.5K	B210Fx-SA166.5K	A126.5K	B210Fx-HA126.5K	B210Fx-SA126.5K

x = O (Normally Open) or C (Normally Closed)

Table 7. Two-Way, Under Cut, 24V with Industrial Actuators Assemblies.

Valve Size (inch)	0 to 10V/4 to 20 mA			2-Position		
2-Way, Under Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
4	A166.530	B204Ux-HA166.530	B204Ux-SA166.530	A126.530	B204Ux-HA126.530	B204Ux-SA126.530
5		B205Ux-HA166.530	B205Ux-SA166.530		B205Ux-HA126.530	B205Ux-SA126.530
6		--	B206Ux-SA166.530		--	B206Ux-SA126.530
	A166.600	B206Ux-HA166.600	--	A126.600	B206Ux-HA126.600	--
8	A166.2K	B208Ux-HA166.2K	B208Ux-SA166.2K	A126.2K	B208Ux-HA126.2K	B208Ux-SA126.2K
10		B210Ux-HA166.2K	B210Ux-SA166.2K		B210Ux-HA126.2K	B210Ux-SA126.2K
12	A166.5K	B212Ux-HA166.5K	B212Ux-SA166.5K	A126.5K	B212Ux-HA126.5K	B212Ux-SA126.5K
14		B214Ux-HA166.5K	B214Ux-SA166.5K		B214Ux-HA126.5K	B214Ux-SA126.5K

x = O (Normally Open) or C (Normally Closed)

Table 8. Three-Way, Full Cut Valves with 24V Industrial Actuators Assemblies.

Valve Size (inch)	0 to 10V/4 to 20 mA			2-Position		
3-Way, Full Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
2	A166.530	B302Fx-HA166.530	B302Fx-SA166.530	A166.530	B302Fx-HA126.530	B302Fx-SA126.530
2.5		B325Fx-HA166.530	B325Fx-SA166.530		B325Fx-HA126.530	B325Fx-SA126.530
3		B303Fx-HA166.530	B303Fx-SA166.530		B303Fx-HA126.530	B303Fx-SA126.530
4		--	B304Fx-SA166.530		--	B304Fx-SA126.530
	A166.600	B304Fx-HA166.600	--	A126.600	B304Fx-HA126.600	--
5		B305Fx-HA166.600	B305Fx-SA166.600		B305Fx-HA126.600	B305Fx-SA126.600
6		B306Fx-HA166.600	B306Fx-SA166.2K		B306Fx-HA126.600	B306Fx-SA126.2K
8	A166.2K	B308Fx-HA166.2K	B308Fx-SA166.2K	A126.2K	B308Fx-HA126.2K	B308Fx-SA126.2K
10	A166.5K	B310Fx-HA166.5K	B310Fx-SA166.5K	A126.5K	B310Fx-HA126.5K	B310Fx-SA126.5K

x= A, B, C or D (See Figure 1.)

Table 9. Three-Way Under Cut Valves with 24V Industrial Actuators Assemblies.

Valve Size (inch)	0 to 10V/4 to 20 mA			2-Position		
3-Way, Under Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
4	A166.530	B304Ux-HA166.530	B304Ux-SA166.530	A126.530	B304Ux-HA126.530	B304Ux-SA126.530
5		--	B305Ux-SA166.530		--	B305Ux-SA126.530
	A166.600	B305Ux-HA166.600	--	A126.600	B305Ux-HA126.600	--
6	A166.2K	B306Ux-HA166.2K	B306Ux-SA166.2K	A126.2K	B306Ux-HA126.2K	B306Ux-SA126.2K
8		B308Ux-HA166.2K	B308Ux-SA166.2K		B308Ux-HA126.2K	B308Ux-SA126.2K
10		B310Ux-HA166.2K	B310Ux-SA166.2K		B310Ux-HA126.2K	B310Ux-SA126.2K
12	A166.5K	B312Ux-HA166.5K	B312Ux-SA166.5K	A126.5K	B312Ux-HA126.5K	B312Ux-SA126.5K
14		B314Ux-HA166.5K	B314Ux-SA166.5K		B314Ux-HA126.5K	B314Ux-SA126.5K

x= A, B, C or D (See Figure 1.)

Table 10. Two-Way Full Cut Valves with 24V Commercial Damper Actuators Assemblies.

Valve Size (inch)	Actuator Part Number[1)]	Assembly Part Number	
2-Way, Full Cut		Normally Open	Normally Closed
2-Position, SR with Switches			
2	GCA126.3U	B202FO-GCA126.3U	B202FC-GCA126.3U
2.5		B225FO-GCA126.3U	B225FC-GCA126.3U
3	GCA126.3U(-D)	B203FO-GCA126.3U	B203FC-GCA126.3U
0 to 10Vdc, NSR Without Switches			
2	GIB161.3U	B202FO-GIB161.3U	B202FC-GIB161.3U
2.5		B225FO-GIB161.3U	B225FC-GIB161.3U
3		B203FO-GIB161.3U	B203FC-GIB161.3U
4	GIB161.3U(-D)	B204FO-GIB161.3U	B204FC-GIB161.3U
5		B205FO-GIB161.3U	B205FC-GIB161.3U
6		B206FO-GIB161.3U	B206FC-GIB161.3U
Floating, NSR Without Switches			
2	GIB131.3U	B202FO-GIB131.3U	B202FC-GIB131.3U
2.5		B225FO-GIB131.3U	B225FC-GIB131.3U
3		B203FO-GIB131.3U	B203FC-GIB131.3U
4	GIB131.3U(-D)	B204FO-GIB131.3U	B204FC-GIB131.3U
5		B205FO-GIB131.3U	B205FC-GIB131.3U
6		B206FO-GIB131.3U	B206FC-GIB131.3U
0 to 10 Vdc SR Without Switches			
2	GCA161.3U	B202FO-GCA161.3U	B202FC-GCA161.3U
2.5		B225FO-GCA161.3U	B225FC-GCA161.3U
3	GCA126.3U(-D)	B203FO-GCA161.3U	B203FC-GCA161.3U
2-Position, SR Without Switches			
2	GCA121.3U(-D)	B202FO-GCA121.3U	B202FC-GCA121.3U
2.5		B225FO-GCA121.3U	B225FC-GCA121.3U
3		B203FO-GCA121.3U	B203FC-GCA121.3U

[1)] The -D designation indicates a dual actuator configuration.

Table 11. Two-Way Under Cut Valves, with 24V Commercial Damper Actuators Assemblies.

Valve Size (inch)	Actuator Part Number	Assembly Part Number	
2-Way, Under Cut		Normally Open	Normally Closed
2-Position, SR with Switches			
4	GCA126.3U(-D)	B204UO-GCA126.3U	B204UC-GCA126.3U
0 to 10Vdc, NSR Without Switches			
4	GIB161.3U	B204UO-GIB161.3U	B204UC-GIB161.3U
5	GIB161.3U(-D)	B205UO-GIB161.3U	B205UC-GIB161.3U
6		B206UO-GIB161.3U	B206UC-GIB161.3U
Floating, NSR Without Switches			
4	GIB131.3U	B204UO-GIB131.3U	B204UC-GIB131.3U
5	GIB131.3U(-D)	B205UO-GIB131.3U	B205UC-GIB131.3U
6		B206UO-GIB131.3U	B206UC-GIB131.3U
0 to 10 Vdc SR Without Switches			
4	GCA161.3U(-D)	B204UO-GCA161.3U	B204UCSGCA161.3U
2-Position, SR Without Switches			
4	GCA121.3U(-D)	B203UO-GCA121.3U	B203UC-GCA121.3U

Table 12. Three-Way Full Cut Valves with 24V Commercial Damper Actuators Assemblies.

Valve Size (inch)	Actuator Part Number[1)]	Assembly Part Number
3-Way, Full Cut		
2-Position, SR with Switches		
2	GCA126.3U	B302Fx-GCA126.3U
2.5	GCA126.3U(-D)	B325Fx-GCA126.3U
3		B303Fx-GCA126.3U
0 to 10Vdc, NSR Without Switches		
2	GIB161.3U	B302Fx-GIB161.3U
2.5		B325Fx-GIB161.3U
3		B303Fx-GIB161.3U
4	GIB161.3U(-D)	B304Fx-GIB161.3U
5		B305Fx-GIB161.3U
Floating, NSR Without Switches		
2	GIB131.3U	B302Fx-GIB131.3U
2.5		B325Fx-GIB131.3U
3		B303Fx-GIB131.3U
4	GIB131.3U(-D)	B304Fx-GIB131.3U
5		B305Fx-GIB131.3U
0 to 10 Vdc SR Without Switches		
2	GCA161.3U	B302Fx-GCA161.3U
2.5	GCA161.3U(-D)	B325Fx-GCA161.3U
3		B303Fx-GCA161.3U

x = A, B, C or D (See Figure 1.)

1) The -D designation indicates a dual actuator configuration.

Table 13. Three-Way Under Cut Valves with 24V Commercial Damper Actuators Assemblies.

Valve Size (inch) 3-Way, Under Cut	Actuator Part Number[1)]	Assembly Part Number
2-Position, SR with Switches		
4	GCA126.3U(-D)	B304Ux-GCA126.3U
0 to 10 Vdc, NSR Without Switches		
4	GIB161.3U	B304Ux-GIB161.3U
5	GIB161.3U(-D)	B305Ux-GIB161.3U
6		B306Ux-GIB161.3U
Floating, NSR Without Switches		
4	GIB131.3U	B304Ux-GIB131.3U
5	GIB131.3U(-D)	B305Ux-GIB131.3U
6		B306Ux-GIB131.3U
0 to 10 Vdc SR Without Switches		
4	GCA161.3U(-D)	B304Ux-GCA161.3U
2-Position, SR Without Switches		
4	GCA121.3U(-D)	B304Ux-GCA121.3U

1) The -D designation indicates a dual actuator configuration.

Table 14. Two-Way Full Cut Valves with 120V Industrial Actuators Assemblies.

Valve Size (inch)	0 to10V/4 to 20 mA			2-Position		
2-Way, Full Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
2	A266.530	B202Fx-HA266.530	B202Fx-SA266.530	A226.530	B202Fx-HA226.530	B202Fx-SA226.530
2.5		B225Fx-HA266.530	B225Fx-SA266.530		B225Fx-HA226.530	B225Fx-SA226.530
3		B203Fx-HA266.530	B203Fx-SA266.530		B203Fx-HA226.530	B203Fx-SA226.530
4		B204Fx-HA266.530	B204Fx-SA266.530		B204Fx-HA226.530	B204Fx-SA226.530
5		---	B205Fx-SA266.530		--	B205Fx-SA226.530
	A266.1K	B205Fx-HA266.1K	--	A226.1K	B205Fx-HA226.1K	--
6	A266.1K	B206Fx-HA266.1K	--	A226.600	--	B206Fx-SA226.600
	A266.600	--	B206Fx-SA266.600	A226.1K	B206Fx-HA226.1K	--
8	A266.2K	B208Fx-HA--266.2K	B208Fx-SA266.2K	A226.2K	B208Fx-HA226.2K	B208Fx-SA226.2K
10	A266.3K	--	B210Fx-SA266.3K	A226.3K	--	B210Fx-SA226.3K
	A266.5K	B210Fx-HA266.5K	--	A226.5K	B210Fx-HA226.5K	--
12	A266.5K	--	B212Fx-SA266.5K	A226.5K	--	B212Fx-SA226.5K
	A266.6K	B212Fx-HA266.6K	--	A226.6K	B212Fx-HA226.6K	--
14	A266.6K	--	B214Fx-SA266.6K	A226.6K	--	B214Fx-SA226.6K
	A266.13K	B214Fx-HA266.13K	--	A226.13K	B214Fx-HA226.13K	--
16	A266.13K	B216Fx-HA266.13K	B216Fx-SA266.13K	A226.13K	B216Fx-HA226.13K	B216Fx-SA226.13K
18	A266.13K	--	B218Fx-SA266.13K	A226.13K	--	B218Fx-SA226.13K
	A266.18K	B218Fx-HA266.18K	--	A226.18K	B218Fx-HA226.18K	--
20	A266.18K	--	B220Fx-SA266.18K	A226.18K	--	B220Fx-SA226.18K
	A266.21K	B220Fx-HA266.21K	--	A226.21K	B220Fx-HA226.21K	--
24	A266.21K	--	B224Fx-SA266.21K	A226.21K	--	B224Fx-SA226.21K
	A266.41K	B224Fx-HA266.41K	--	A226.41K	B224Fx-HA226.41K	--

x = O (Normally Open) or C (Normally Closed)

Table 15. Two-Way Under Cut Valves with 120V Industrial Actuators Assemblies.

Valve Size (inch)	0 to10V/4 to 20 mA			2-Position		
2-Way, Under Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
4	A266.530	B204Ux-HA266.530	B204Ux-SA266.530	A226.530	B204Ux-HA226.530	B204Ux-SA226.530
5		--	B205Ux-SA266.530		--	B205Ux-SA226.530
	A266.600	B205Ux-HA266.600	--	A226.600	B205Ux-HA226.600	--
6		B206Ux-HA266.600	--		B206Ux-HA226.600	--
	A266.530	--	B206Ux-SA266.530	A226.530	--	B206Ux-SA226.530
8	A266.1K	B208Ux-HA266.1K	B208Ux-SA266.1K	A226.1K	B208Ux-HA226.1K	B208Ux-SA226.1K
10	A266.2K	B210Ux-HA266.2K	B210Ux-SA266.2K	A226.2K	B210Ux-HA226.2K	B210Ux-SA226.2K
12	A266.3K	B212Ux-HA266.3K	B212Ux-SA266.3K	A226.3K	B212Ux-HA226.3K	B212Ux-SA226.3K
14	A266.5K	B214Ux-HA266.5K	B214Ux-SA266.5K	A226.5K	B214Ux-HA226.5K	B214Ux-SA226.5K
16	A266.6K	--	B216Ux-SA266.6K	A226.6K	--	B216Ux-SA226.6K
	A266.13K	B216Ux-HA266.13K	--	A226.13K	B216Ux-HA226.13K	--
18	A266.6K	--	B218Ux-SA266.6K	A226.6K	--	B218Ux-SA226.6K
	A266.13K	B218Ux-HA266.13K	--	--	B218Ux-HA226.13K	--
20	A266.13K	B220Ux-HA266.13K	B220Ux-SA266.13K	A226.13K	B220Ux-HA226.13K	B220Ux-SA226.13K
24	A266.18K	B224Ux-HA266.18K	B224Ux-SA266.18K	A226.18K	B224Ux-HA226.18K	B224Ux-SA226.18K

X = C (Normally Closed) or O (Normally Open

Table 16. Three-Way Full Cut Valves with 120V Industrial Actuators Assemblies.

Valve Size (inch)	0 to10V/4 to 20 mA			2-Position		
3-Way, Full Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
2	A266.530	B302Fx-HA266.530	B302Fx-SA266.530	A226.530	B302Fx-HA226.530	B302Fx-SA226.530
2.5		B325Fx-HA266.530	B325Fx-SA266.530		B325Fx-HA226.530	B325Fx-SA226.530
3		B303Fx-HA266.530	B303Fx-SA266.530		B303Fx-HA226.530	B303Fx-SA226.530
4		--	B304Fx-SA266.530		--	B304Fx-SA226.530
	A266.600	B304Fx-HA266.600	--	A226.600	B304Fx-HA226.600	
5		--	B305Fx-SA266.600	A226.600	--	B305Fx-SA226.600
	A266.1K	B305Hx-HA266.1K	--	A226.1K	B305Fx-HA226.1K	--
6	A266.2K	B306Fx-HA266.2K	B306Fx-SA266.2K	A226.1K	--	B306Fx-SA226.1K
				A226.2K	B306Fx-HA226.2K	--
8	A266.2K	B308Fx-HA266.2K	B308Fx-SA266.2K	A226.2K	B308Fx-HA226.2K	B308Fx-SA226.2K
10	A266.5K	B310Fx-HA266.5K	B310Fx-SA266.5K	A226.5K	B310Fx-HA226.5K	B310Fx-SA226.5K
12	A266.6K	--	B312Fx-SA266.6K	A226.6K	--	B312Fx-SA226.6K
	A266.13K	B312Fx-HA266.13K	--	A226.13K	B312Fx-HA226.13K	--
14	A266.13K	B314Fx-HA266.13K	B314Fx-SA266.13K	A226.13K	B314Fx-HA226.13K	B314Fx-SA226.13K
16	A266.13K	B316Fx-HA266.13K	B316Fx-SA266.13K	A226.13K	B316Fx-HA226.13K	B316Fx-SA226.13K
18	A266.18K	B318Fx-HA266.18K	B318Fx-SA266.18K	A226.18K	B318Fx-HA226.18K	B318Fx-SA226.18K
20	A266.41K	B320Fx-HA266.41K	B320Fx-SA266.41K	A226.21K	--	B320Fx-SA226.21K
				A226.41K	B320Fx-HA226.41K	--
24	A266.41K	B324Fx-HA266.41K	B324Fx-SA266.41K	A226.41K	B324Fx-HA226.41K	B324Fx-SA226.41K

x= A, B, C or D (See **Figure 1**.)

Table 17. Three-Way Under Cut Valves with 120V Industrial Actuators Assemblies.

Valve Size (inch)	0 to10V/4 to 20 mA			2-Position		
3-Way, Under Cut	Actuator Part Number	Assembly Part Number		Actuator Part Number	Assembly Part Number	
		High Temp	Standard Temp		High Temp	Standard Temp
4	A266.530	B304Ux-HA266.530	B304Ux-SA266.530	A226.530	B304Ux-HA226.530	B304Ux-SA226.530
5		--	B305Ux-SA266.530		--	B305Ux-SA226.530
	A266.600	B305Ux-HA266.600	--	A226.600	B305Ux-HA226.600	--
6	A266.1K	B306Ux-HA266.1K	B306Ux-SA266.1K	A226.1K	B306Ux-HA226.1K	B306Ux-SA226.1K
8	A266.1K	B308Ux-HA266.1K	B308Ux-SA266.1K		B308Ux-HA226.1K	B308Ux-SA226.1K
10	A266.2K	B310Ux-HA266.2K	B310Ux-SA266.2K	A226.2K	B310Ux-HA226.2K	B310Ux-SA226.2K
12	A266.5K	B312Ux-HA266.5K	B312Ux-SA266.5K	A226.3K	--	B312Ux-SA226.3K
				A226.5K	B312Ux-HA226.5K	--
14	A266.5K	B314Ux-HA266.5K	B314Ux-SA266.5K	A226.5K	B314Ux-HA226.5K	B314Ux-SA226.5K
16	A266.13K	B316Ux-HA266.13K	B316Ux-SA266.13K	A226.13K	B316Ux-HA226.13K	B316Ux-SA226.13K
18		B318Ux-HA266.13K	B318Ux-SA266.13K		B318Ux-HA226.13K	B318Ux-SA226.13K
20		B320Ux-HA266.13K	B320Ux-SA266.13K		B320Ux-HA226.13K	B320Ux-SA226.13K
24	A266.18K	B324Ux-HA266.18K	B324Ux-SA266.18K	A226.18K	B324Ux-HA226.18K	B324Ux-SA226.18K

x= A, B, C or D (See **Figure 1**.)

Table 18. Standard Temperature Valves with 120V Commercial Damper Actuators Assemblies.

Valve Size (inch)	Actuator Part Number	Assembly Part Number	
		Normally Open	Normally Closed
2-Position, SR without Switches			
2-Way, Full Cut			
2	GCA221.3U	B202FO-GCA221.3U	B202FC-GCA221.3U
2.5	GCA221.3U	B225FO-GCA221.3U	B225FC-GCA221.3U
3	GCA221.3U(-D)	B203FO-GCA221.3U	B203FC-GCA221.3U
Under	GCA221.3U(-D)	B203UO-GCA221.3U	B203UC-GCA221.3U
3-Way Full Cut			
2	GCA221.3U	B302Fx-GCA221.3U	--
2.5	GCA221.3U(-D)	B325Fx-GCA221.3U	--
3		B303Fx-GCA221.3U	--
3-Way Under Cut			
4	GCA221.3U(-D)	B304Ux-GCA221.3U	--

Mounting and Installation

All A-Series industrial actuators are suitable for direct mounting on Siemens resilient seat butterfly valves. Commercial actuators require a mounting bracket (See *Accessories/Kits*).



Table 19. Bolt Tightening Sequence and Torque Chart.

Valve Size in Inches	Bolt Size (Threads UNC-2B)	Maximum Bolt Torque Requirement in ft-lbs (Nm)
2,3,4	5/8”-11	35 (4)
5,6,8	3/4”-10	60 (7)
10,12	7/8”-9	75 to 110 (8 to 12)
14,16	1”-8	120 (14)
18	1-1/8”-7	130 (15)
20	1-1/8”-7	130 (15)
24	1-1/4”-7	150 to 155 (17 to 18)

Installation Instructions

1. Lower the valve into the open pipe work with the disc in the 10° open position. Valves with non-spring actuators are shipped in this position.

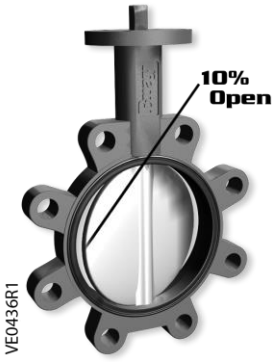


Figure 2. Disc in 10° Open Position.

2. Once the valve is placed in the pipework, turn the disc to the full-open position. Gradually remove the flange spreaders.

3. Center the valve body to the flanges and tighten the bolts hand-tight. Slowly close the valve clockwise to check for adequate disc clearance.

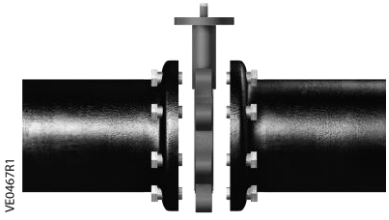


Figure 3. Centered Valve Body.

4. Return the disc to the full-open position and cross tighten all bolts to the proper torque specifications (See Table 19).

   NOTE: Do not install with the disc in the fully closed position This will cause seat distortion. When flange bolts are tightened, the rubber will close around the disc edge creating excessive breakaway torque in the initial operation. The valve should always be installed with the disc open at 10°.

Installation is now complete.



CAUTION:
DO NOT lower the valve into the pipe with the pipe work spread insufficinently or with the disc in the fully open position. This can lead to disc edge damage and can impact the flange.



CAUTION:
DO NOT use flange gaskets. The butterfly valve seat has a molded-in O-ring that creates a positive seal against stadard ANSI flange faces.



CAUTION:
Incorrect pipe alignment will cause interference between the disc edge and the flange face creating leakage, excessive torque and damage to the disc and seat.

Operation

The seat in a resilient seat butterfly valve has molded O-rings on its flange face. No gaskets are required as these O-rings serve the function of a gasket. The flange face and molded O-rings of the seat extend beyond the body face-to-face to ensure sealing at the flange faces. The seat material, which extends past the face is compressed in installation and flows toward the center of the valve seat I.D.

The elastomer seat acts as a liquid, and the displaced elastomer moves toward the point of least resistance. The seat I.D. of all resilient seat butterfly valves is smaller than the disc O.D. This difference, the disc-seat interference, plus the increased interference due to the elastomer movement toward the seat center after installation, has been engineered to be the basis for pressure rating capability and the related seating/unseating torques.

3-Way Configuration Change

CAUTION:
Always wear the proper safety gear when working on mechanical or electrical equipment. Failure to do so can result in injury or death. 3-Way valve components are heavy and must be properly supported at all times. Disconnect all power and input signals from electric actuators before servicing

Typical 3-Way Assembly

To change the configuration of a 3-way valve in the field, the assembly must first be removed from service. The only configuration changes that can be made with the assembly in line is to move the actuator from the primary valve to the secondary valve. The primary valve is defined as the valve with the actuator mounted on it. The other valve is the secondary valve. See Figure 4 for a typical 3-way assembly.

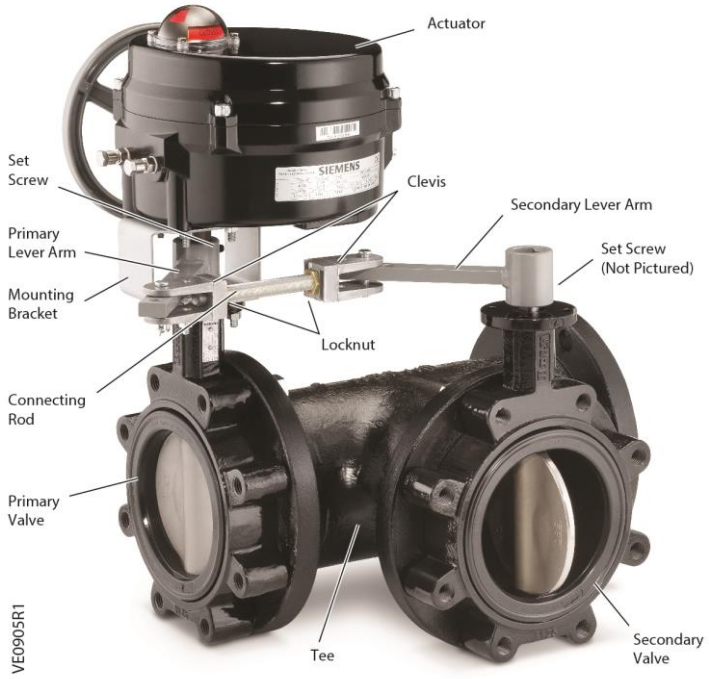


Figure 4. Typical 3-Way Assembly.

Actuator Removal

1. Remove the hex nuts and lockwashers from the mounting studs in the actuator base. See Figure 5.



Figure 5. Mounting Hardware.

2. Remove the actuator.

Linkage Kit Removal

1. Remove the clevis pin from the clevis on each end of the connecting rod and remove the assembly.
2. Loosen the set screws on the primary valve's lever arm.
3. Remove the hex nuts and lockwashers from the valve mounting bolts. See Figure 5.
4. Remove the lever arm and mounting bracket from the valve.
5. Loosen the set screw on the secondary valve and remove the lever arm.
6. If necessary, remove either valve that needs to be located on a different port and reinstall it there.

   NOTE:
   Use Figure 1 to choose possible valve/actuator locations. The valve shown with the mounting bracket is the primary valve.

Linkage Kit and Actuator Repositioning

1. Place the mounting bracket and lever arm on the valve that will be the primary valve. The lever arms must be oriented in such a way as to rotate the valve clockwise to close and counterclockwise to open and not interfere with hand wheel operation (if applicable). Figure 1 shows the preferred placement of the lever arms and connecting rod for all configurations.
2. Orient the bracket and arm with the beveled portion of the bracket in line with the quadrant of travel of the lever arm. See Figure 1.
3. Attach the mounting bolts to the mounting bracket and valve. Tighten the hex nuts and lockwashers to the mounting bolts.
4. Tighten the setscrews on both lever arms. Leave a little space between the lever arm collar and the face of the valve flange so that the lever arm and valve flange do not wear on each other. See Figure 6.

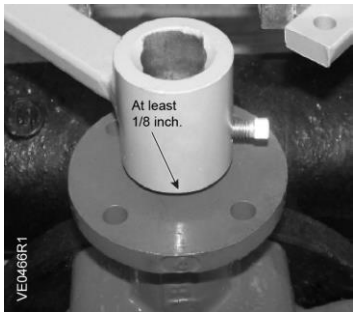


Figure 6. Valve Flange.

5. Attach the clevis and connecting rod assembly to the lever arms. Each clevis can be rotated on the connecting arm to lengthen or shorten the assembly. This may be necessary to ensure proper close-off of both valves.
6. Place the actuator on what will be the primary valve.

NOTES:

- Ensure that an actuator being located on a normally closed valve in the fully closed position and the primary valve is fully closed. Also ensure that an actuator being located on a normally open valve is in the fully open position and the primary valve is fully open.

- Ensure that the hand wheel is oriented away from the lever arm assembly. See Figure 7.

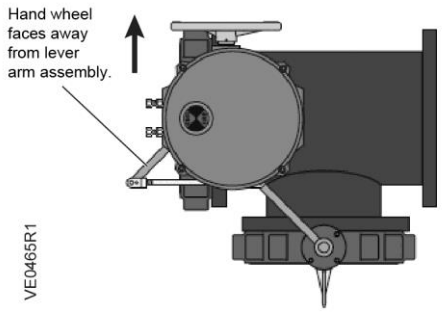


Figure 7. Proper Hand Wheel Alignment.

7. Attach the hex nuts and lockwashers to the mounting studs in the actuator and tighten.

8. Use the actuator to verify close-off of both valves.

9. Reinstall the tee/assembly, if removed from the line, using the recommended installation techniques.

The configuration change is now complete.

Service

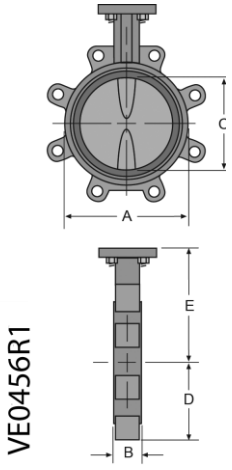
WARNING:
No valve maintenance, including removal of commercial or industrial actuators should be performed until the piping system is completely depressurized.

Dimensions – 2-Way, OpenAir Commercial Electric Actuators

Valve Body

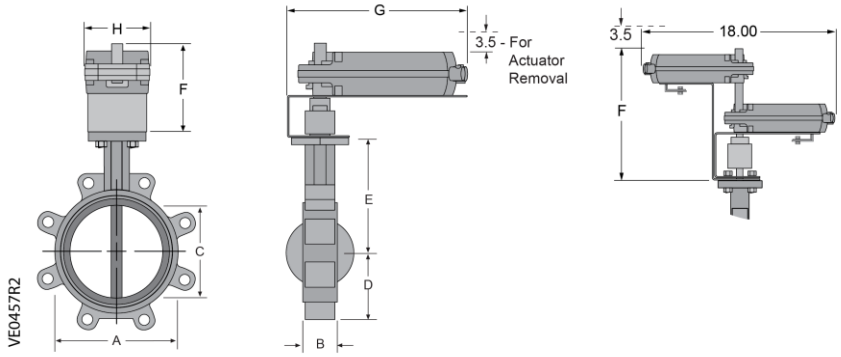
Table 20. 2-Way, 2" to 8", Resilient Seat Butterfly Valves.

Model Number	Size		CVS		A	B	C	D	E	Lug Bolting Data			Weight[1]	
	In.	mm	90°	60°						BC	Holes	Threads	lbs.	kg
B202	2	50	144	61	3.69	1.62	2.00	2.30	5.50	4.75	4	5/8-11	7.0	3.12
B225	2.5	65	282	107	4.19	1.75	2.50	2.57	6.00	5.50	4	5/8-11	8.0	3.63
B203	3	80	461	154	4.88	1.75	3.00	2.81	6.25	6.00	4	5/8-11	9.0	4.08
B204	4	100	841	274	6.06	2.00	4.00	4.09	7.00	7.50	8	5/8-11	15.0	6.80
B205	5	125	1376	428	7.06	2.12	5.00	4.61	7.50	8.50	8	3/4-10	20.0	9.07
B206	6	150	1850	567	8.12	2.12	5.75	5.06	8.00	9.50	8	3/4-10	23.0	10.43
B208	8	200	3316	1081	10.50	2.50	7.75	6.05	9.56	11.75	8	3/4-10	42.0	19.05
1- Weights are for valve bodies only.														



Commercial Actuators

Model Number	F	G	H	Weight[1]	
				lbs	kg
GIB	7.43	10.96	3.95	4.4	2.0
GCA	7.43	10.96	3.95	4.9	2.2
Dual Actuator	11.75	18.00	4.00	12.8	5.8
Largest actuator dimension shown					



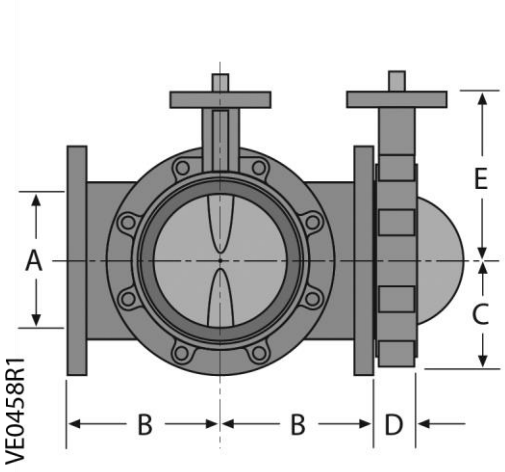
Dimensions (Continued) – 3-Way, OpenAir Commercial Electric Actuators

Valve Body

Table 21. 3-Way, 2” to 6”, Resilient Seat Butterfly Valves.

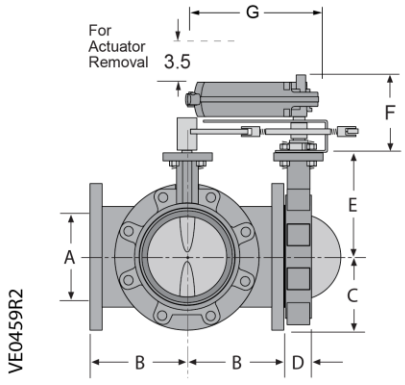
Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data		
	In.	mm	90°	60°						BC	Holes	Threads
B302	2	50	144	61	2.00	4.50	2.30	1.62	5.50	4.75	4	5/8-11
B325	2.5	65	282	107	2.50	5.00	2.57	1.80	6.00	5.50	4	5/8-11
B303	3	80	461	154	3.00	5.50	2.81	1.80	6.25	6.00	4	5/8-11
B304	4	100	841	274	4.00	6.50	4.09	2.00	7.00	7.50	8	5/8-11
B305	5	125	1376	428	5.00	7.50	4.61	2.12	7.50	8.50	8	3/4-10
B306	6	150	1850	567	6.00	8.00	5.06	2.12	8.00	9.50	8	3/4-10

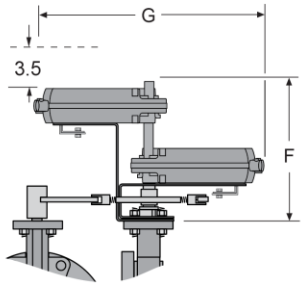
3-Way Tee Weights			
Size		Weight	
Inches	mm	lbs	kg
2	50	19	8.6
2.5	65	27	12.2
3	80	39	17.7
4	100	62	28.1
5	125	79	35.8
6	150	96	43.5
8	200	155	70.3
10	250	270	122.5
12	300	380	172.4
14	350	435	197.3
16	400	550	249.5
18	450	665	301.6
20	500	855	387.8
24	609	1330	603.3



Commercial Actuators

Model Number	F	G	Weight[1]	
			lbs	kg
GIB	7.43	10.96	4.4	2.0
GCA	7.43	10.96	4.9	2.2
Dual Actuator	11.75	18.00	12.8	5.8
Largest actuator dimension shown				





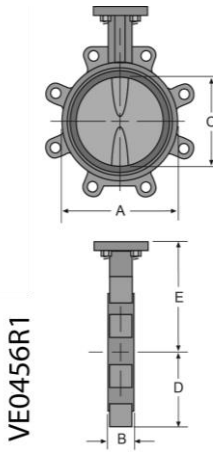
Dimensions (Continued) – 2-Way, Industrial Actuators

Valve Body

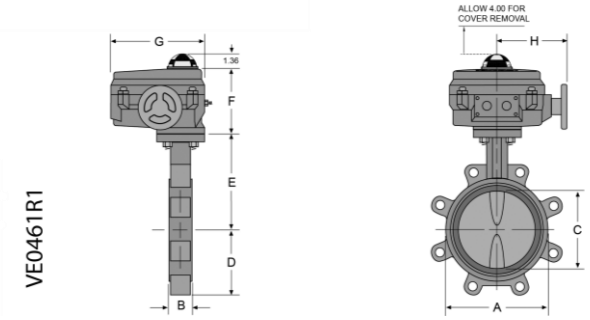
Table 22. 2-Way, 2" to 24", Resilient Seat Butterfly Valves.

Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data			Weight[1]	
	In.	mm	90°	60°						BC	Holes	Threads	lbs	kg
B202	2	50	144	61	3.69	1.62	2.00	2.30	5.50	4.75	4	5/8-11	7.0	3.12
B225	2.5	65	282	107	4.19	1.75	2.50	2.57	6.00	5.50	4	5/8-11	8.0	3.63
B203	3	80	461	154	4.88	1.75	3.00	2.81	6.25	6.00	4	5/8-11	9.0	4.08
B204	4	100	841	274	6.06	2.00	4.00	4.09	7.00	7.50	8	5/8-11	15.0	6.80
B205	5	125	1376	428	7.06	2.12	5.00	4.61	7.50	8.50	8	3/4-10	20.0	9.07
B206	6	150	1850	567	8.12	2.12	5.75	5.06	8.00	9.50	8	3/4-10	23.0	10.43
B208	8	200	3316	1081	10.50	2.50	7.75	6.05	9.56	11.75	8	¾-10	42.0	19.05
B210	10	250	5430	1710	12.75	2.50	9.75	7.69	10.75	14.25	12	7/8-9	66.0	29.94
B212	12	300	8077	2563	14.88	3.00	11.75	9.02	12.25	17.00	12	7/8-9	88.0	39.92
B214	14	350	10538	3384	17.05	3.00	13.25	9.93	13.62	18.75	12	1-8	114.0	51.71
B216	16	400	13966	4483	19.21	4.00	15.25	11.30	14.75	21.25	16	1-8	166.0	75.30
B218	18	450	17214	5736	21.12	4.25	17.25	12.16	16.00	22.75	16	1-1/8 – 7	226.0	102.51
B220	20	500	22339	7144	23.25	5.00	19.25	14.00	17.25	25.00	20	1-1/8 – 7	305.0	138.35
B224	24	600	33154	11040	33.00	5.94	23.28	17.56	19.50	29.50	4	1-1/4 – 7	500.0	226.80

1- Weights are for valve bodies only.



A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.530	6.4	4.8	6.5	10
Axxx.600	5.6	7.5	5.8	13
Axxx.1K/Axxx.2K	6.6	10.1	7.8	28
Axxx.3K/Axxx.5K/ Axxx.6K	7.2	12.1	9.5	48
Axxx.13K/Axxx.18K	12.1	18.8	9.5	118
Axxx.21K	12.3	32.1	28.9	195
Axxx.41K	12.3	32.1	28.9	195

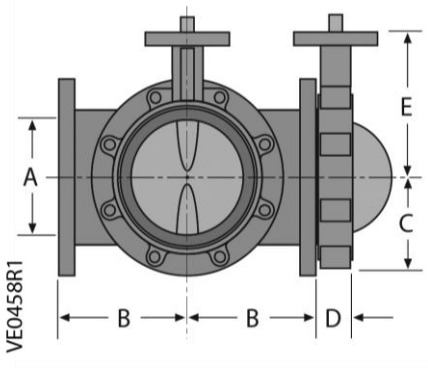


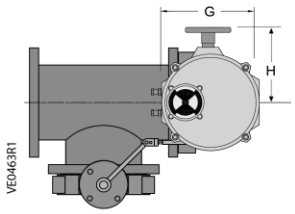
Dimensions (Continued) – 3-Way, Industrial Actuators

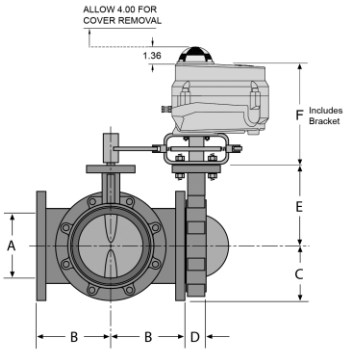
Valve Body

Table 23. 3-Way, 2" to 24", Resilient Seat Butterfly Valves.

Model Number	Size		Cv		A	B	C	D	E	Lug Bolting Data		
	In.	mm	90°	60°						BC	Holes	Threads
B302	2	50	144	61	2.00	4.50	2.30	1.62	5.50	4.75	4	5/8-11
B325	2.5	65	282	107	2.50	5.00	2.57	1.80	6.00	5.50	4	5/8-11
B303	3	80	461	154	3.00	5.50	2.81	1.80	6.25	6.00	4	5/8-11
B304	4	100	841	274	4.00	6.50	4.09	2.00	7.00	7.50	8	5/8-11
B305	5	125	1376	428	5.00	7.50	4.61	2.12	7.50	8.50	8	3/4-10
B306	6	150	1850	567	6.00	8.00	5.06	2.12	8.00	9.50	8	3/4-10
B308	8	200	3316	1081	8.00	9.00	6.05	2.50	9.50	11.75	8	3/4-10
B310	10	250	5430	1710	10.00	11.00	7.69	2.50	10.75	14.25	12	7/8-9
B312	12	300	8077	2563	12.00	12.00	9.02	3.00	12.25	17.00	12	7/8-9
B314	14	350	10538	3384	14.00	14.00	9.93	3.00	13.62	18.75	12	1-8
B316	16	400	13966	4483	16.00	15.00	11.30	4.00	14.75	21.25	15	1-8
B318	18	450	17214	5736	18.00	16.50	12.16	4.26	16.00	22.75	16	1-1/8 – 7
B320	20	500	22339	7144	20.00	18.00	14.00	5.00	17.25	25.00	20	1-1/8 – 7
B324	24	610	3315	11044	24.00	22.00	16.00	5.94	19.50	29.50	20	1-1/4 – 7







A-Series Actuators				
Model Number	F	G	H	Weight (lbs)
Axxx.530	9.4	8.0	6.5	10
Axxx.600	8.6	7.5	5.8	12
Axxx.1K/Axxx.2K	10.73	10.1	7.8	28
Axxx.3K	11.33	12.10	3.50	48
Axxx.5K	13.2	12.10	9.50	48
Axxx.6K	13.2	12.10	9.50	118
Axxx.13K/Axxx.18K	20.5	12.10	9.50	118
Axxx.21K	22.3	32.1	28.9	195
Axxx.41K	22.3	32.1	28.9	195

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