

VF6000 Series Butterfly Valve and VA300/VA200 Actuator

Product Bulletin

LIT-12013276
November 2019

The VF6000 Series Butterfly Valve and VA300/VA200 Actuator shut off or regulate the flow of hot or chilled water in a HVAC system.

This series covers models from DN50 to DN1000 with either on/off or modulating output via various actuators. VF Series Standard-Pressure, Standard-Temperature Butterfly Valves operate with a wide range of HVAC applications, including two-position and modulating control of hot, chilled, or condenser water, and 50/50 glycol solutions.

All valves are factory tested for shutoff at 100% of the fully rated pressure. These valves are also bidirectional allowing positive flow shutoff in either direction.

Actuators and valves are calibrated in the factory and are packed separately for ease of delivery and installation.



Figure 1: VF6000 Series Butterfly Valve and VA300/VA200 Actuator

Features and benefits	
Groove-type seat	Reliable sealing and less torque results in a longer service life
Sealed flange surface	Broadside and arc design is suitable for various types of flanges
Mid-plummer-block spliced pole	Prevents the lower shaft disengaging from the body due to frequent vibration
Manual clutch	Automatic switching is more convenient and reliable
Worm gear drive	High transmission torque and self-locking (VA300/VA200)
Valve position display	Position is quickly viewable

Ordering charts

Table 1: VF6000 Series Valve

V	F	6	4	6	1	G	A	-	C	Butterfly Valve		
1	2	6	Product family							6 = Separation valve PN16 rated pressure		
		3										
		4	Body type							4 = Two-way		
		4										
		6	End connections							3 = Lugged (up to DN600)		
		5								6 = Wafer		
		1	Flow characteristics							1 = Equal % up to 60% opening		
		6										
		G	Valve size							A = 2 in. (DN50) B = 2-1/2 in. (DN65)		
		7								C = 3 in. (DN80) D = 4 in. (DN100)		
										E = 5 in. (DN125) F = 6 in. (DN150)		
										G = 8 in. (DN200) H = 10 in. (DN250)		
										J = 12 in. (DN300) K = 14 in. (DN350)		
										L = 16 in. (DN400) M = 18 in. (DN450)		
										N = 20 in. (DN500) P = 24 in. (DN600)		
										Q = 28 in. (DN700) R = 32 in. (DN800)		
										T = 36 in. (DN900) U = 40 in. (DN1000)		
		A	Disc materials							A = Ductile iron, GGG40, nylon 11 coated		
		8								S = Stainless steel 304		
		-	C	Place of origin						- C = Made in China		
		9	10									

Example: VF6461GA-C = PN16 Separated Butterfly Valve, Two-Way, Wafer Connection, Equal %, DN200, GGG40 Disc with Nylon 11 coating, Made in China

*VF6461PxN-C is available in the DN600 series. For details, refer to Tables 4, 5, and 6.

** For stainless steel 316 or aluminum-bronze disc materials options, contact local JCI representatives.

Table 2: VA300/VA200 Series Actuator

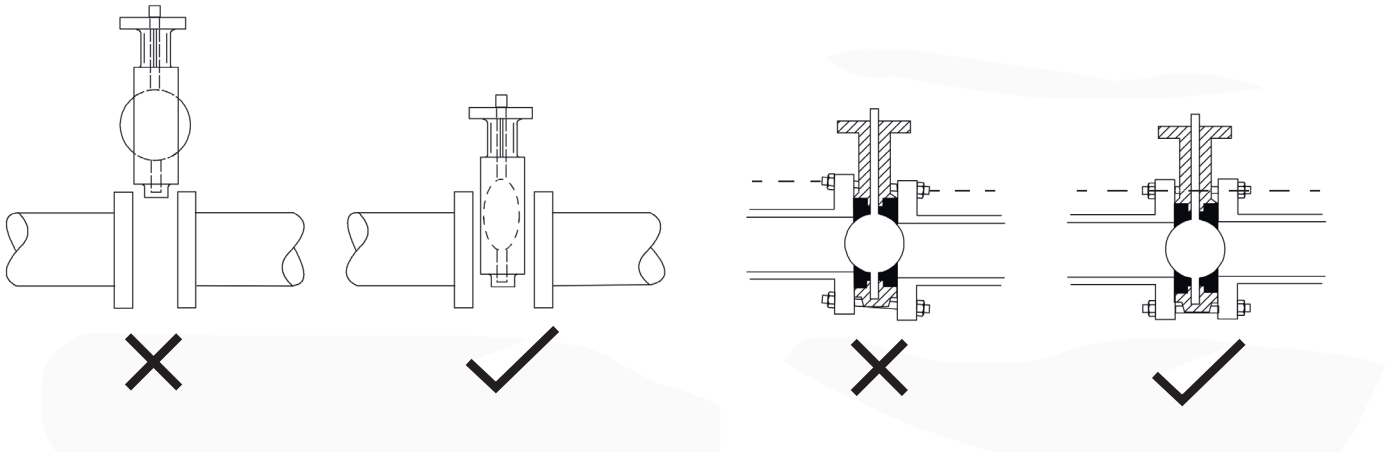
V	A	3	0	3	B	D	C	-	C	Actuator		
1	2	3	Close-off pressure							2 = 1000 kPa (10 bar)		
		3								3 = 1600 kPa (16 bar)		
		0	3	Torque							01 = 35 Nm 02 = 80 Nm	
		4	5								03 = 200 Nm 04 = 400 Nm	
											05 = 600 Nm 06 = 800 Nm	
											07 = 1000 Nm 08 = 1700 Nm	
											09 = 2300 Nm 10 = 3500 Nm	
											11 = 5000 Nm 12 = 8000 Nm	
				B	Control signal						B = On/off	
				6							C = Modulating	
				D	Power						D = 220V 1ph 50Hz AC ±10%	
				7								
				C	Auxiliary switch						C = Two switches	
				8								
				-	C	Place of origin					- C = Made in China	
				9	10							

Example: VA303BDC-C = 1600 kPa (16 bar) Close-off Pressure Actuator, 200 Nm, On/Off Control, 220V 1ph 50Hz AC ±10% Power Supply, Two Auxiliary Switches, Made in China

*VAxxxxxN-C is the new generation.

Installation

1. Make sure that you spread and align the pipework.
2. Make sure that you open the disc beyond the valve body face.
3. Check for proper disc clearance and pipe alignment.

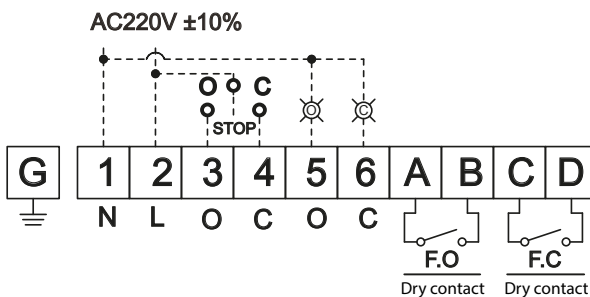


Wiring

Warning Shock Hazard: Disconnect the power supply before you wire the connections to avoid possible electrical shock or damage to the equipment.

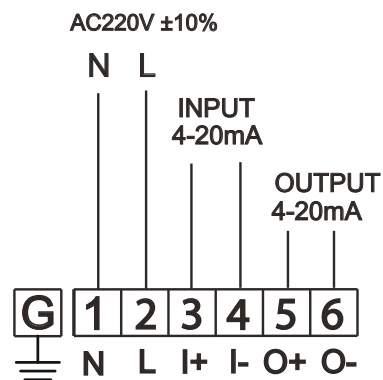
For IP67 actuator wiring: 6 mm ~ 12 mm cable for type VA301/201 and 10 ~ 14mm cable for type VA302/202~VA306/212.

Figure 2: On/off actuator 220 V



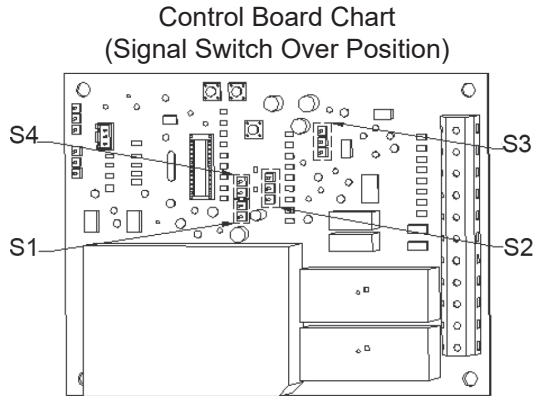
Note: Dry contact is only for indication, not for control signal.

Figure 3: Proportional actuator 220 V



Note: Input and output impedance = 250 ohms

Figure 4: Modulating actuator



I/O Signal Switch Over

SIGNAL	INPUT		OUTPUT	
	S1	S2	S3	S4
4-20 mA	•	•	•	•
0-10V	•	•	•	•
2-10V	•	•	•	•

Note: Factory setting of signal is 4-20mA.

Valve performance

Table 3: Kv values

Size DN		Kv Value at different opening degree								Kv value at 90° opening
mm	inch	10°	20°	30°	40°	50°	60°	70°	80°	
50	2	1.1	3.8	10.2	22	38	60	100	132	193
65	2.5	2.0	7.5	18.2	35	61	95	187	240	315
80	3	2.5	9.8	26	48	83	126	214	338	425
100	4	3.8	14.6	39	72	119	221	361	606	723
125	5	6.5	24	62	118	217	394	599	1038	1243
150	6	10	41	95	175	326	542	873	1260	1859
200	8	19	64	165	306	573	995	1567	2310	3124
250	10	28	101	245	451	836	1462	2253	3256	4757
300	12	34	129	312	615	1137	2125	3248	4991	7058
350	14	47	163	390	795	1498	2573	3980	5749	8319
400	16	62	231	508	1077	1973	3381	5385	8099	11458
450	18	75	256	621	1208	2315	3925	6331	9474	13612
500	20	103	346	859	1692	3086	5348	8513	13109	18748
600	24	139	494	1153	2389	4466	7561	11945	18088	25217
700	28	191	659	1674	3224	5990	10659	17442	25194	36821
800	32	257	973	2302	4533	8235	14123	23021	31613	45995
900	36	329	1253	2950	5862	10810	18184	29756	42893	61044
1000	40	510	1919	4456	7956	13494	21939	36000	54649	68874

Table 4: Effective flow coefficients for 60° opening

Valve size		Pipe size																	
inch	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
2	50	60	57	55	53														
2.5	65		95	93	88	85													
3	80			126	123	119	116												
4	100				221	215	207	197											
5	125					394	383	357	341										
6	150						542	516	490	474									
8	200							995	960	916	885								
10	250								1,462	1,428	1,380	1,340							
12	300									2,125	2,087	2,026	1,972						
14	350										2,573	2,544	2,494	2,445					
16	400											3,381	3,350	3,293	3,182				
18	450												3,925	3,900	3,799	3,707			
20	500													5,348	5,244	5,092	4,967		
24	600														7,561	7,453	7,278	7,120	
28	700															10,659	10,531	10,308	10,093
32	800																14,123	13,983	13,723
36	900																		18,184
40	1000																		18,031
																			21,939

Table 5: Effective flow coefficients for 90° opening

Valve size		Pipe size																	
inch	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
2	50	193	139	121	105														
2.5	65		315	249	190	162													
3	80			425	343	272	241												
4	100				723	565	456	373											
5	125					1,243	997	695	597										
6	150						1,859	1,246	977	867									
8	200							3,124	2,368	1,879	1,648								
10	250								4,757	3,875	3,135	2,739							
12	300									7,058	5,953	4,866	4,233						
14	350										8,319	7,478	6,428	5,707					
16	400											11,458	10,409	8,994	7,270				
18	450												13,612	12,677	10,115	8,682			
20	500													18,748	15,347	12,458	10,901		
24	600														25,217	21,917	18,389	16,211	
28	700															36,821	32,409	27,247	23,883
32	800																45,995	41,757	36,053
36	900																	61,044	55,907
40	1000																		68,874

Valve dimensions

Figure 5: Lugged and wafer dimensions

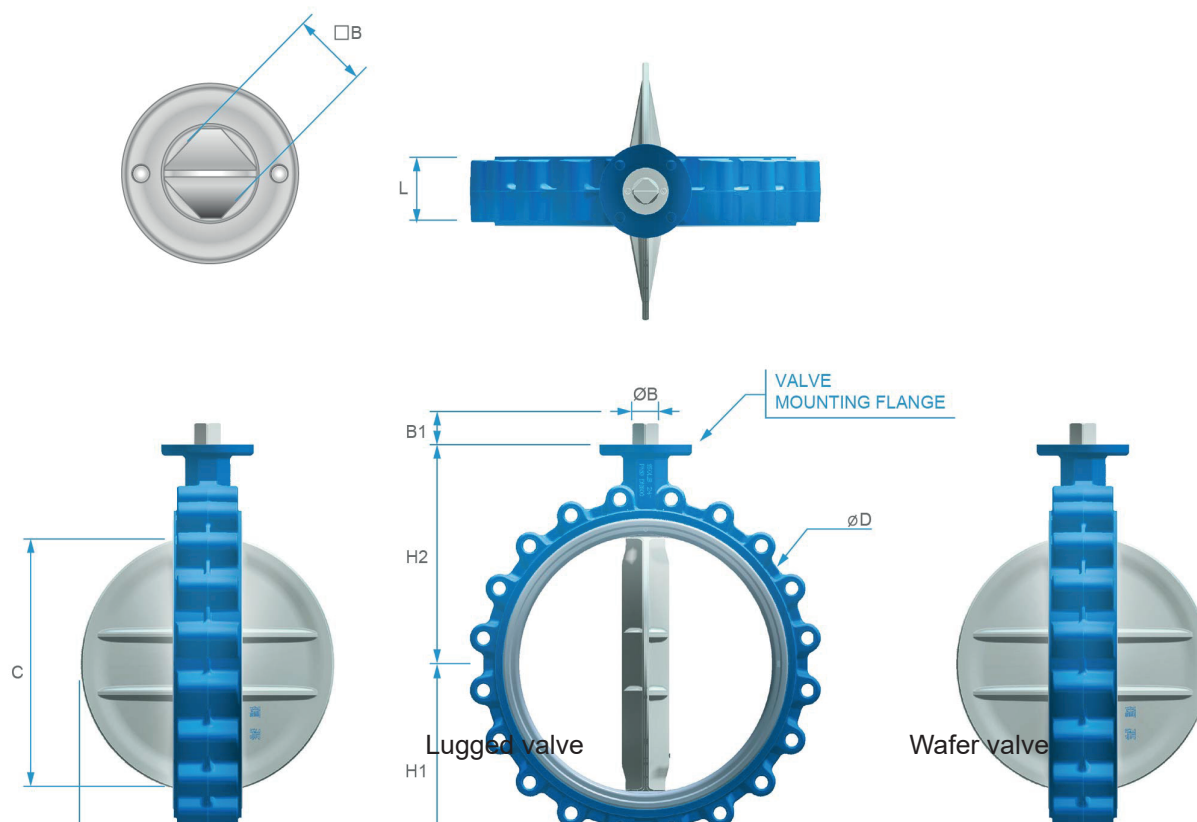


Table 6: Valve dimensions (mm) and weight (kg)

Size		Face to Face	Dimensions					Mounting Flange		Shaft End					No. of holes for lugged connection	Weight kg
mm	inch		L	H1	H2	φD	C	C1	Valve		φB	B1	B2	Key (H*W)		
		Type	PCD													
50	2	43	65	143	96	39	8	F07	70	14	19	-	-	11	4	3
65	2.5	46	71	155	110	55	13	F07	70	14	19	-	-	11	4	3.8
80	3	46	77	162	124	69	19	F07	70	14	19	-	-	11	8	4
100	4	52	107	181	148	91	27	F07	70	14	19	-	-	11	8	5.3
125	5	56	122	197	180	115	36	F07	70	18	19	-	-	14	8	7.3
150	6	56	150	210	206	140	47	F07	70	18	19	-	-	14	8	8.2
200	8	60	165	240	259	186	68	F10	102	22	24	-	-	17	12	13.5
250	10	68	201	286	320	239	90	F10	102	25	24	-	-	19	12	21.2
300	12	78	234	309	370	289	111	F10	102	28	24	-	-	22	12	32.5
350	14	78	303	329	412	325	128	F12	125	35	29	-	-	27	16	48
400	16	102	335	361	475	375	143	F12	125	35	29	-	-	27	16	60
450	18	114	363	393	530	423	162	F14	140	48	38	-	-	36	20	80
500	20	127	397	427	585	473	182	F14	140	48	38	-	-	36	20	125
600	24	154	459	492	687	560	214	F16	165	60	48	-	-	36	20	200
700	28	165	511	563	790	655	255	F16	165	75	90	74.7	20*12	-	-	249
800	32	190	592	630	870	736	285	F25	254	80	110	-	-	46	-	365
900	36	203	632	660	972	841	331	F25	254	85	110	-	-	55	-	424
1000	40	216	698	749	1090	941	375	F30	298	100	155	-	-	55	-	648

VA300/VA200 Actuator dimensions

Figure 6: Model 01

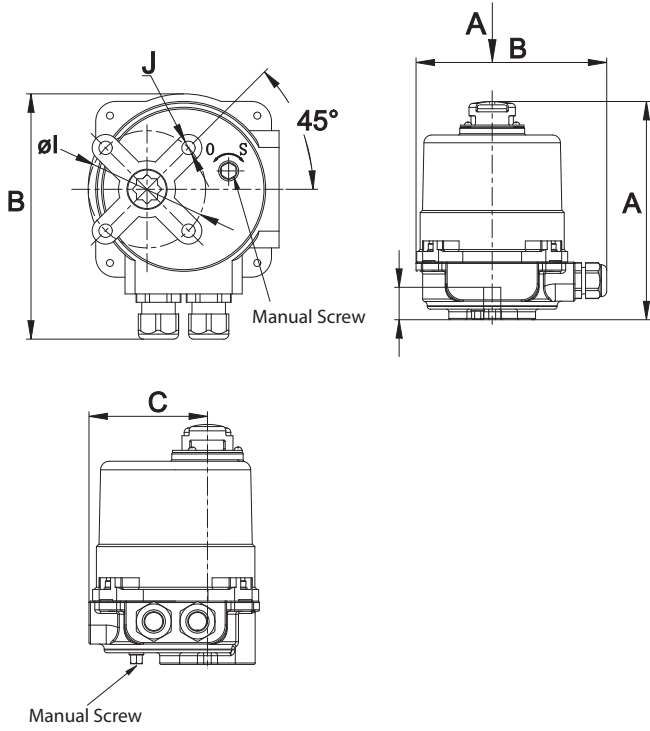


Figure 7: Model 01xxxN-C and 02xxxN-C

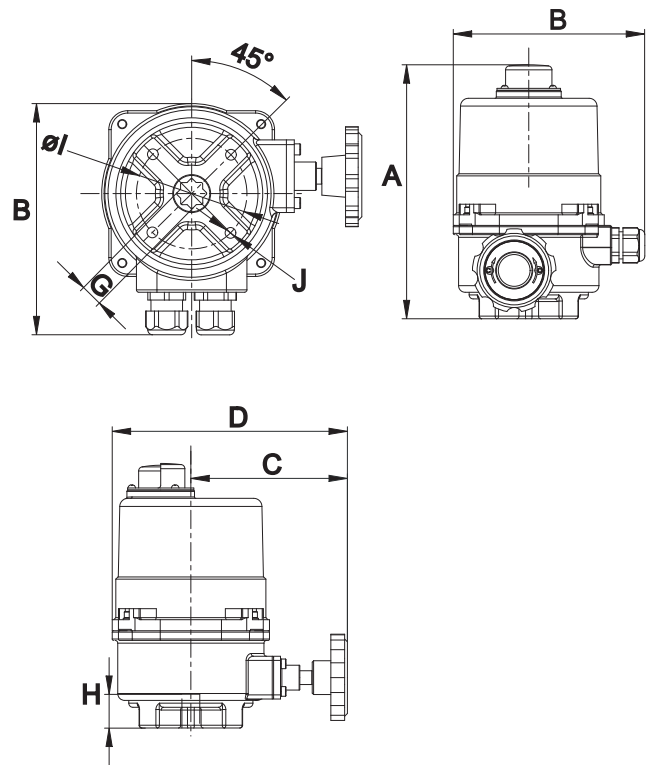


Figure 8: Model 03-07

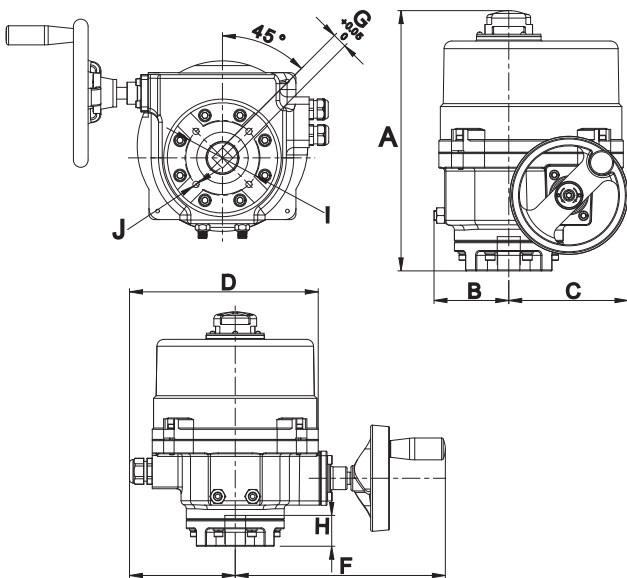


Figure 9: Model 08 and 09

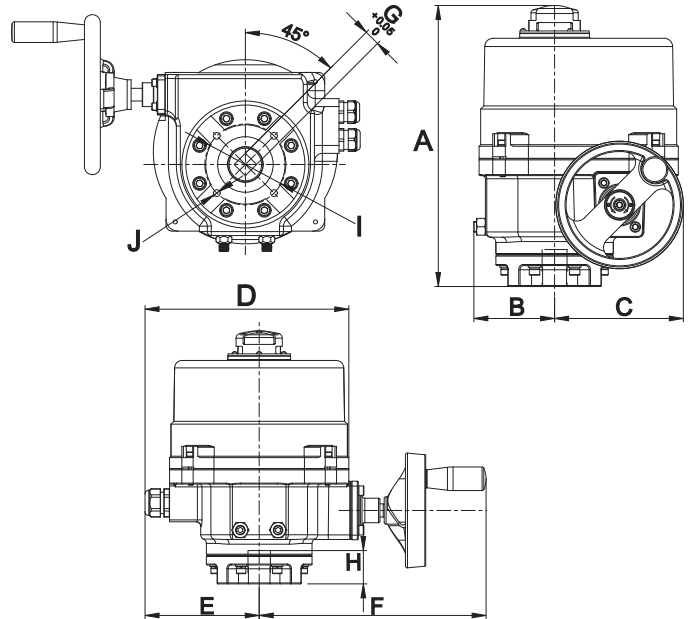


Figure 10: Model 10 and 11xxxN-C

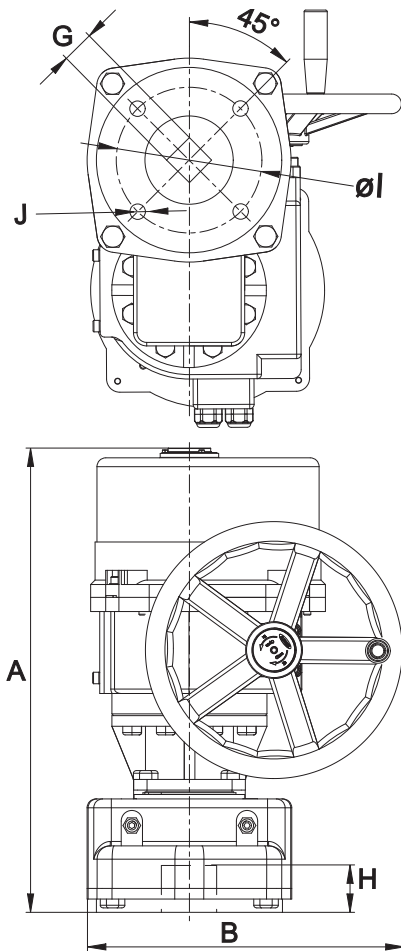


Figure 11: Model 12

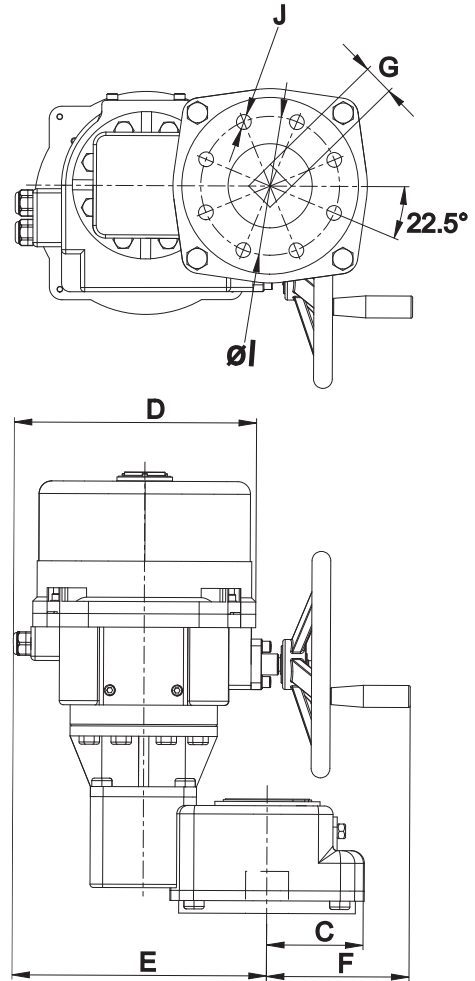





Table 7: Actuator dimensions

Model	A	B	C	D	E	F	G		H	Øl	J	Type	Weight
							VA300	VA200					
1	165	145	78.5	-	-	-	11	11	20	70	4-M8	F07	3
01xxxN-C	185	150	82	-	-	-	-	11	20	70	4-M8	F07	3
02xxxN-C	192	145	108	165	-	-	11	14	20	70	4-M8	F07	3.6
03xxxN-C	268	79	122.5	216	120	240	-	14	35	70	4-M8	F07	11
03	268	79	122.5	216	120	240	14	17	35	70	4-M8	F10	11
04	327	103	187	262	150	297	17	19	55	102	4-M10	F10	22
05	327	103	187	262	150	297	19	22	55	102	4-M10	F10	22
06	327	103	187	262	150	297	22	27	55	125	4-M10	F12	22
07	327	103	187	262	150	297	-	27	55	125	4-M12	F12	22
08	380	119	241	293	161	346	-	36	65	140	4-M16	F14	36
09	380	119	241	293	161	346	-	36	65	165	4-M20	F16	36
10	532	359	119	293	308	186	-	74.7	85	165	4-M20	F16	76
11xxxN-C	532	359	119	293	308	186	-	46	85	254	4-M20	F25	76
12	543	375	215	293	343	168	-	55	130	254	8-M16	F25	107

Ordering charts

Table 8: 1600 kPa Close-off Pressure

VF6000 DN50-DN300 Butterfly Valves PN16 1600 kPa Close-off					Non spring return																	
					M9300						VA300											
																						
					On/off, floating 230 V	On/off, floating	0 (2) to 10 VDC	0 (4) to 20 mA (with resistor)	On/off, floating 230 V	On/off, floating	0 (2) to 10 VDC	0 (4) to 20 mA (with resistor)	On/off, floating	0 (2) to 10 VDC - 0 (4) to 20	On/off, floating	0 (2) to 10 VDC - 0 (4) to 20	On/off, floating	0 (2) to 10 VDC - 0 (4) to 20	On/off, floating	0 (2) to 10 VDC - 0 (4) to 20	On/off, floating	0 (2) to 10 VDC - 0 (4) to 20
					Auxiliary switch					M9300-2 option												
2 SPDT, 3.0 (1.5) A at 24 VAC																						
2 SPST, 16 A at 250 VAC																						
2 SPST, 10 A at 250 VAC																						
Position feedback																						
0(2) to 10 VDC																						
0(2) to 10 VDC and 4 to 20 mA																						
Power requirement																						
220 VA +/- 10% 50/60 Hz																						
24 VAC +20%/-15% 24VDC +/- 10%																						
Electrical connections																						
Screw terminal																						
24 VAC +20%/-15% 24VDC +/- 10%																						
Accessories																						
Heater																						
DN	Kvs On/Off	Kvs Prop. 60°	Wafer connection	Lugged connection	Close-off pressure (kPa)																	
DN50	193	60	VF6461Ax-C	VF6431Ax-C	1600		1600															
DN65	315	95	VF6461Bx-C	VF6431Bx-C	1600		1600															
DN80	425	126	VF6461Cx-C	VF6431Cx-C			1600		1600													
DN100	723	221	VF6461Dx-C	VF6431Dx-C					1600													
DN125	1243	394	VF6461Ex-C	VF6431Ex-C									1600									
DN150	1859	542	VF6461Fx-C	VF6431Fx-C									1600									
DN200	3124	995	VF6461Gx-C	VF6431Gx-C										1600								
DN250	4757	1462	VF6461Hx-C	VF6431Hx-C											1600							
DN300	7058	2125	VF6461Jx-C	VF6431Jx-C																	1600	
Actuator					VA9320-AUA-3	VA9320-HGA-3	VA9335-AUA-3	VA9335-HGA-3	VA301BDC-C	VA301CDC-C	VA302BDCN-C	VA302CDC-C	VA303BDC-C	VA303CDC-C	VA304BDC-C	VA304CDC-C	VA305BDC-C	VA305CDC-C	VA306BDC-C	VA306CDC-C		

Technical specifications

Table 10: Valve specifications

Product	VF6000 Series Butterfly Valve		
Application	Regulation of hot / chilled water with glycol up to max. 50% vol. in HVAC system.		
Media and temperature	Water -10 ~ 100 °C for incontinuous flow, temperature could reach 120°C		
Pipe connection	Wafer type:		
	Flange PN16	DN50 ~ DN1000	
	Lugged type:		
	Flange PN16	DN50 ~ DN600	
Nominal pressure	PN16		
Close-off pressure	1000 kPa - 1600 kPa. See Table 8 and Table 9		
Materials	Body	Ductile Iron, GG25 (DN50 ~ DN 150), GGG40 (DN200 ~ DN1000)	
	Seat	Ethylene propylene diene monomer (EPDM)	
	Stem	Stainless steel 410	
	Disc	Ductile iron, GGG40, nylon 11 coated or stainless steel 304	

Table 11: Actuator specifications (1 of 2)

Product		VA-2xx Series Electric Valve Actuators						
Model		VA201	VA201...N	VA202...N	VA203	VA204	VA205	VA206
Torque output (max.) Nm		35	50	80	200	400	600	800
Power requirements	On/off (floating) control models (VA)	40	40	40	110	180	180	180
	Proportional control models (VA)	45	45	45	115	185	185	185
Input signal	On/off (floating) control models	220 Vac, ±10%, 50/60Hz						
	Proportional control models	4 to 20mA DC						
Input impedance	Proportional control models only	250 ohms						
Feedback signal	On/off (floating) models	Fully open and close dry contacts						
	Proportional models	4 to 20mA DC, output impedance is 250 ohms						
Switch contact rating		10A at 250 Vac, 10A at 30 VDC			16A at 250 Vac, 16A at 30 VDC			
Maximum stroke		90 ±1°						
Nominal timing for whole stroke(s)		11	15	22	39	29	39	47
Ambient operating temperature limits		-4 to 149°F (-20 to 65°C)						
Agency compliance		EMC: 2014/30/EU. LVD: 2014/35/EU						
Enclosure rating		IP67						
Shipping weight (kg)		3.1	3.1	3.7	11	22	22	22

Table 11: Actuator specifications (2 of 2)

Product		VA-2xx Series Electric Valve Actuators (cont.)					
Model		VA207	VA208	VA209	VA210	VA211...N	VA212
Torque output (max.) Nm		1000	1700	2300	3500	5000	8000
Power requirements	On/off (floating) control models (VA)	230	440	440	440	440	440
	Proportional Control Models (VA)	235	445	445	445	445	445
Input signal	On/off (floating) control models	220Vac, ±10%, 50/60Hz					
	Proportional control models	4 to 20mA DC					
Input impedance	Proportional control models only	250 ohms					
Feedback signal	On/off (floating) models	Fully open and close dry contacts					
	Proportional models	4 to 20mA DC, output impedance is 250 ohms					
Switch contact rating		16A at 250 Vac, 16A at 30 VDC					
Maximum stroke		90 ±1°					
Nominal timing for whole stroke(s)		47	34	47	76	105	143
Ambient operating temperature limits		-4 to 149°F (-20 to 65°C)					
Agency compliance		EMC: 2014/30/EU. LVD: 2014/35/EU					
Enclosure rating		IP67					
Shipping weight (kg)		22	36	36	76	76	107

Table 12: Actuator specifications

Product		VA-3xx Series Electric Valve Actuators					
Model		VA301	VA302	VA303	VA304	VA305	VA306
Torque output (max.) Nm		35	100	200	400	600	800
Power requirements	On/off (floating) control models (VA)	40	110	110	180	180	180
	Proportional control models (VA)	45	115	115	185	185	185
Input signal	On/off (floating) control models	220 Vac, ±10%					
	Proportional control models	4 to 20 mA DC					
Input impedance	Proportional control models only	250 ohms					
Feedback signal	On/off (floating) models	Fully open and close dry contacts					
	Proportional models	4 to 20 mA DC					
Output impedance	Proportional control models only	250 ohms					
Switch contract rating		10A at 250 Vac 10A at 30 VDC	16A at 250 Vac, 16A at 30 VDC				
Maximum stroke		90 deg					
Nominal timing for whole stroke(s)		11	19	39	29	39	47
Ambient operating temperature limits		-4°F to 149°F (-20°C to 65°C)					
Agency compliance		EMC: 2014/30/EU. LVD: 2014/35/EU					
Enclosure rating		IP67					
Shipping weight (kg)		3.1	11.0	11.0	22.0	22.0	22.0

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

Contact information

Contact information

Region	Group	Contact information
Global	Johnson Controls	www.johnsoncontrols.com/contact-us www.johnsoncontrols.com/locations
North America	PENN Controls	www.penncontrols.com/contact 1-888-220-6668
	Verasys Controls	www.verasyscontrols.com/contact 1-844-820-4830
	Triatek	www.triatek.com/contact 1-888-424-1922 1-770-242-1922

Sales support

Region	Group	Contact information
North America	Product Sales Support	jciorder@jci.com 1-800-275-5676; Option 1: Order Support
	Applied DX Sales Support	applieddxsalessupport@jci.com
	Triatek Sales Support	sales@triatek.com 1-888-424-1922 1-770-242-1922

Technical support

Region	Group	Contact information
North America	Product Technical Support	1-800-275-5676 Option 2: Product Technical Support, then: <ul style="list-style-type: none"> • Option 1: HVAC (psotechsupport@jci.com) • Option 2: FX and Metasys • Option 3: PENN Controls/Refrigeration (refrig.techsupport@jci.com)
	Field Support Center	CGFieldSupportCenter@jci.com 1-800-524-1330
	Applied DX Technical Support	applieddxtechsupport@jci.com
	Triatek Technical Support	www.triatek.com/contact 1-888-424-1922 1-770-242-1922
Latin America	Technical Support	BE-LA-Support@jci.com
Europe	Technical Support	Refer to your respective country for support: www.johnsoncontrols.com/locations
Asia (except Japan)	Technical Support	Asia.TechnicalSupport@jci.com
Japan	Technical Support	Yoshiyuki.Maeda@jci.com
Middle-East, Turkey, and Africa	Technical Support	BE-MEA-Systems-Tech-Support@jci.com

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty

APAC JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJIANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 - CHINA	Europe JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	NA/SA JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA
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For more contact information, refer to www.johnsoncontrols.com/locations