

# VFB Series

## PN16 (6/10) DN25...DN500 2-way Wafer Butterfly Valves

### Product Bulletin

*VFB Series Valves are specifically designed for a wide range of Heating, Ventilating, and Air Conditioning (HVAC) applications, including two-position and modulating control of hot, chilled, or condenser water, and 50/50 glycol solutions for closed and opened hydronic circuits.*

*All valves are factory tested for bubble-tight shutoff at 100% of the fully-seated pressure.*

*All valves are PN16 rated and available in two-way configuration. They are bidirectional, allowing positive shutoff of 1000 kPa or 1200 kPa for DN25 to DN500 sizes or 350 kPa for DN100 to DN500 sizes with the flow in either direction.*



- **Low Seating/Unseating Torques**

Reduce actuator torque and size requirements, particularly with lower-pressure rated valves

- **Bubble-Tight Shutoff**

Ensures positive closure when needed.

- **Compatible with PN6 (DN25 to DN400), PN10 and PN16 pipe flanges**

Enables field configuration with readily available standard fittings.

- **Nylon 11™ coated valve disc**

Reduces friction and ensures reliability in harsh fluid conditions.

- **Broad Range of Pre-Assembled Actuators**

Offers a wide selection for new and replacement electric and pneumatic actuators.

- **High-Integrity Components**

Provide quality valve assemblies, combining long cycle life with optimal engineered functional designs.

# VALVES

## Application Overview

**All VFB Butterfly Valves** are available with a factory-assembled and calibrated actuator, to provide years of trouble-free operation. The wide variety of actuator choices includes (both spring return and non-spring return) and high-torque rotary electric actuators.

The valve and actuator can be provided in Normally Open (N.O.) or Normally Closed (N.C.) combinations.

These butterfly valves have an inherent modified equal percentage relationship between disc rotation and flow at a constant pressure drop (as illustrated in Figure 1).

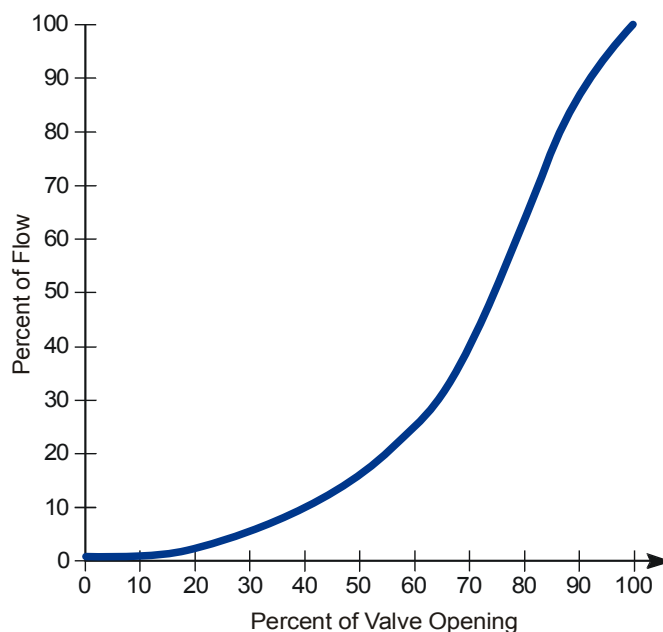
The valve body is cast iron and meets the temperature and pressure requirements for ISO PN6/PN10/PN16 DIN pipe flanges. The valve neck is extended to allow for 50 mm of insulation as well as easy access to the actuator.

The resilient seat of VFB Butterfly Series is molded from Ethylene Propylene Diene Monomer (EPDM), and is secured to the valve body by means of a tongue and groove design. The tongue and groove fit permits easy seat replacement after years of service.

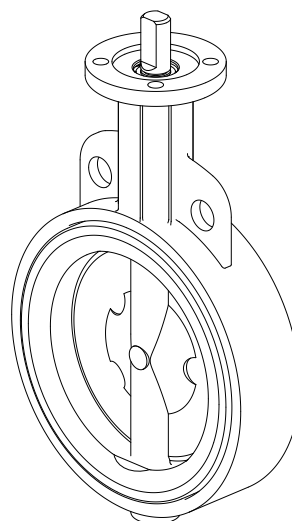
The disc is constructed of ductile iron, and is spherically machined, hand polished, and coated with nylon 11 to provide bubble-tight shutoff, minimum torque requirements, and longer seat life. In addition, the nylon 11 coating also resists corrosion and abrasion. The discs for 3.5 bar closeoff pressure valves are undercut to minimize torque requirements.

The stem is made in 416 stainless steel. The stem-to-disc coupling design features the exclusive Double D connection. Without the use of stem retention screws, stem strength is maximized, servicing is simplified, and disc leakage is eliminated.

The flow characteristics of VFB Series Standard-Pressure, Standard-Temperature Butterfly Valves are illustrated in Figure 1. Inherent flow characteristics are modified equal percentage.



**Figure 1: Modified Equal Percentage Valve Flow Characteristics**



**Figure 2: VFB Series Standard-Pressure, Standard-Temperature Butterfly Valve**

## Ordering Codes for Valves without Actuator

V	F	B	x	x	x	x
<b>Closeoff:</b> H = High Closeoff Pressure (see table 1) L = Low Closeoff Pressure (see table 2)						
<b>Valve size:</b> 025 = DN25, 1 inch 032 = DN32, 1-1/4 inch 040 = DN40, 1-1/2 inch 050 = DN50, 2 inch 065 = DN65, 2-1/2 inch 080 = DN80, 3 inch 100 = DN100, 4 inch 125 = DN125, 5 inch 150 = DN150, 6 inch 200 = DN200, 8 inch 250 = DN250, 10 inch 300 = DN300, 12 inch 350 = DN350, 14 inch 400 = DN400, 16 inch 450 = DN450, 18 inch 500 = DN500, 20 inch						
<b>Wafer Butterfly Valve Series</b>						

**Table 1: Flow coefficients and closeoff pressures for VFBxxxH valves**

Code	Kvs Value	Max $\Delta p$ (kPa) Close-off Pressure
VFB025H	52	1000
VFB032H	72	1000
VFB040H	126	1000
VFB050H	124	1200
VFB065H	243	1200
VFB080H	397	1200
VFB100H	723	1200
VFB125H	1083	1200
VFB150H	1591	1200
VFB200H	2852	1200
VFB250H	4670	1200
VFB300H	6946	1200
VFB350H	9063	1000
VFB400H	12044	1000
VFB450H	14804	1000
VFB500H	19212	1000

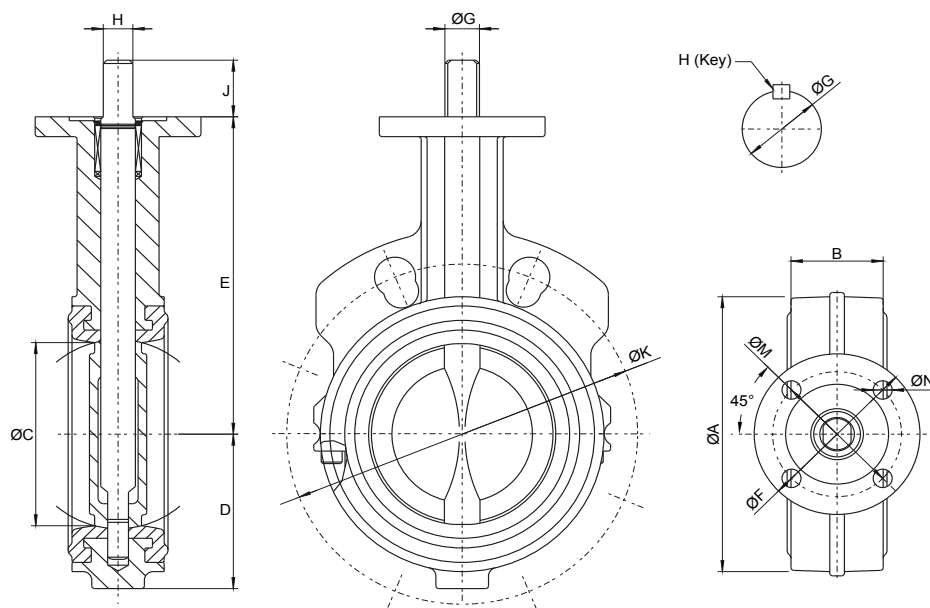
**Table 2: Flow coefficients and closeoff pressures for VFBxxxL valves**

Code	Kvs Value	Max $\Delta p$ (kPa) Close-off Pressure
VFB100L	723	350
VFB125L	1083	350
VFB150L	1591	350
VFB200L	2852	350
VFB250L	4670	350
VFB300L	6946	350
VFB350L	9063	350
VFB400L	12044	350
VFB450L	14804	350
VFB500L	19212	350

**Table 3: Valve Flow Coefficients, Kv per Disc Position**

Valve Size mm	Valve Size inch	Disc Position, Degrees Open*								
		90° Maximum Stroke for Valves with ON/OFF or Floating Control and for Manual Valves	80°	70°	60° Maximum Recommended Stroke for Proportional Control	50°	40°	30°	20°	10°
<b>25</b>	1	52	48	31	15	9.5	4.8	2.3	0.84	0.006
<b>32</b>	1-¼	72	63.5	42.5	24.4	12.5	6.24	2.89	0.85	0.12
<b>40</b>	1-½	126	112	75	43	22	11	5.1	1.5	0.22
<b>50</b>	2	124	98	72	53	37	23	14	6	0.9
<b>65</b>	2-½	243	192	140	92	58	37	21	10	1.3
<b>80</b>	3	397	313	230	123	83	53	30	13	1.7
<b>100</b>	4	721	603	427	236	147	94	53	23	2.6
<b>125</b>	5	1.083	986	667	368	231	146	84	37	4.3
<b>150</b>	6	1.591	1.326	882	488	304	194	111	48	5.2
<b>200</b>	8	2.852	2.444	1.601	876	585	362	207	87	10.3
<b>250</b>	10	4.670	3.892	2.535	1.471	925	574	329	139	16.3
<b>300</b>	12	6.946	5.789	3.778	2.204	1.371	864	477	202	23.3
<b>350</b>	14	9.063	7.632	5.108	2.910	1.848	1.135	650	257	29.2
<b>400</b>	16	12.044	10.115	6.766	3.855	2.448	1.504	861	341	38.7
<b>450</b>	18	14.804	12.467	8.656	4.933	3.133	1.924	1.102	436	49.9
<b>500</b>	20	19.212	16.178	10.780	6.144	3.901	2.326	1.372	544	61.9

\* Recommended disc rotation for control valve sizing is up to 60° open



**Figure 3: Two-Way VFB Series Standard-Pressure, Standard-Temperature Butterfly Valve Dimensions**  
(See table 4)

**Table 4**

Valve Size mm	Valve Size inch	A	B	C	D	E	F	M	N	G	H	J	Valve Net Weight** in kg	Top Flange ISO 5211	K*	Number of holes on Flange	K*	Number of holes on Flange	K*	Number of holes on Flange
															PN6		PN10		PN 16	
25	1	60	30	32	43	25	65	50	7	10	8	25	1	F05	75	4 x M10	85	4 x M12	85	4 x M12
32	1-¼	70	32	41	53	25	65	50	7	10	8	25	1,15	F05	90	4 x M12	100	4 x M16	100	4 x M16
40	1-½	80	32	47	55	25	65	50	7	10	8	25	2.75	F05	100	4 x M12	110	4 x M16	110	4 x M16
50	2	94	42	51	56	140	90	70	10	14	10	32	3.05	F07	110	4 x M12	125	4 x M16	125	4 x M16
65	2-½	106	45	64	63	152	90	70	10	14	10	32	4.05	F07	130	4 x M12	145	4 x M16	145	4 x M16
80	3	124	45	76	71	159	90	70	10	14	10	32	4.3	F07	150	4 x M16	160	8 x M16	160	8 x M16
100	4	154	51	102	87	178	90	70	10	16	11	32	4.85	F07	170	4 x M16	180	8 x M16	180	8 x M16
125	5	179	55	127	102	190	90	70	10	19	13	32	7.2	F07	200	8 x M16	210	8 x M16	210	8 x M16
150	6	206	55	146	115	203	90	70	10	19	13	32	9.5	F07	225	8 x M16	240	8 x M20	240	8 x M20
200	8	267	59	197	146	241	150	125	14	22	16	32	12	F07	280	8 x M16	295	8 x M20	295	12 x M20
250	10	324	67	248	181	273	150	125	14	30	22	51	17	F12	335	12 x M16	350	12 x M20	355	12 x M24
300	12	378	77	298	206	311	150	125	14	30	22	51	20	F12	395	12 x M20	400	12 x M20	410	12 x M24
350	14	433	78	337	238	346	150	125	14	35	10x10***	51	23	F12	445	12 x M20	460	16 x M20	470	16 x M24
400	16	488	102	387	273	375	150	125	14	35	10x10***	51	27	F12	495	16 x M20	515	16 x M24	525	16 x M27
450	18	536	114	438	305	406	210	165	21	50	10x12***	64	30	F16	---	---	565	20 x M24	585	20 x M27
500	20	591	127	489	356	436	210	165	21	50	10x12***	64	33	F16	---	---	650	20 x M24	650	20 x M30

\* Disc chordal dimension at valve face.

\*\* Net weight is for valve only (no actuator).

\*\*\* Key: the key is needed to link the actuator. It is inside the package of the valve. Dimensions in mm (high x width).

## Product Guidelines

Please be sure to read the following information carefully before installing a VFB Series Butterfly Valve Assembly:

- Make sure that the pipeline and flange faces are clean. Pipe scale, metal chips, weld slag, and weld rods can obstruct disc movement and damage the disc and seat.
- The resilient seat of the valve is equipped with molded O-rings on the face of the seat; do not use gaskets.
- The valves should be handled by the extended valve neck only. Heavier valves may require a nylon sling to be used as a hoist around the valve neck and and/or cast-iron tee (on three-way assemblies). Never pick up a valve by the actuator, mounting bracket, or interconnecting linkage.
- Most VFB Series Butterfly Valve Assemblies are shipped with the disc in the near-closed position (approximately 10° open).

## VALVE ACTUATION

All VFB Series Wafer Butterfly Valves are available with a wide range of factory-installed electric actuators. The Ordering Codes tables present the actuator choices available for each valve (*for more informations on the actuators see the related Product Bulletin*). These valve and actuator combinations have been sized with torque safety factors to provide adequate actuator torque for years of trouble-free operation.

The **M9000 electric actuators** series are available, both in spring return and non spring configuration, for assemblies with DN 25 up to DN 100 valves.

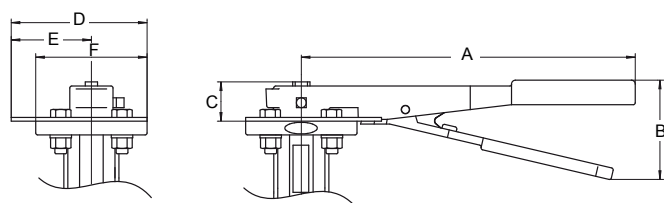
The **VA-9070 Series Electric Actuators** are available in both two-position and modulating styles. These non-spring return, rotary motion actuators are housed in a low profile, compact die-cast aluminum IP65 (NEMA4) enclosure and are factory calibrated for 90° disc rotation.

For manually operated actuator and valve assemblies, **ten-position manual handles** or **gear-operated manual hand wheels** are available; see Table 5 and Table 6 for more details.

For Valve + Accessory assembly add:

-000M for Ten-Position Manual Handle

-000G for Gear-Operated Manual Handle

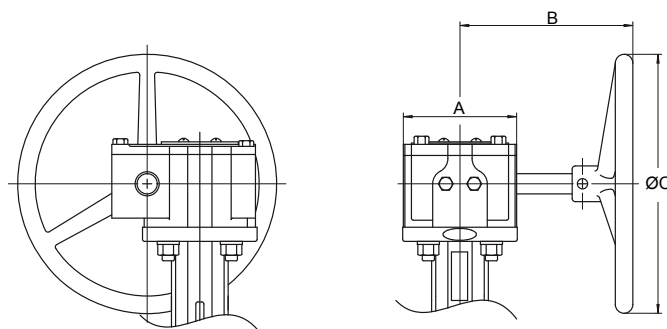


**Figure 4: Dimensions for Ten-Position Manual Handle**  
(See table 5)

**Table 5**

Valve Size mm	Valve Size inch	Code Number*	A	B	C
25 to 40	1/2" to 1-1/2"	VF-998-100	196	60	25
50 to 80	2" to 3"	VF-998-101	270	80	32
100	4"	VF-998-102	270	80	32
125 to 150	5" to 6"	VF-998-103	270	80	32
200	8"	VF-998-104	298	80	32
250 to 300	10" to 12"	VF-998-105	298	80	51

\* Kit includes manual lever and mounting hardware



**Figure 5: Dimensions for Gear-Operated Manual Hand Wheel**  
(See table 6)

**Table 6**

Valve Size mm	Valve Size inch	Code Number*	A	B	C
50 to 150	2" to 6"	VF-998-303	90	136	203
200	8"	VF-998-304	150	190	203
250 to 300	10" to 12"	VF-998-305	150	190	203
350 to 400	14" to 16"	VF-998-307	150	303	305
450 to 500	18" to 20"	VF-998-308	210	379	305

\* Kit includes a manual gear operator and mounting hardware.

## Ordering Codes for factory assemblies with M9000 Series Actuators

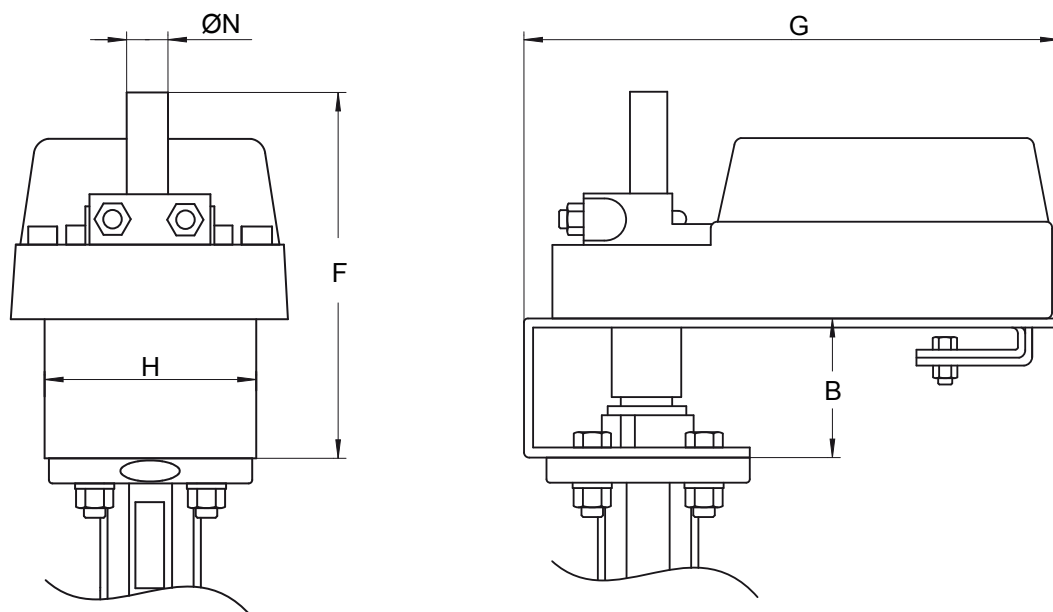
V	F	B	X	X	X	X	+	5	X	X	X	X	X

## Admitted combination of VBF Valves with M9000 Series Actuators

VFB Wafer Butterfly Valves				M9000 Series Actuators			LINKAGE*
				Non Spring Return		Spring Return	
				16 Nm	24 Nm	20 Nm	
				M9116	M9124	M9220	
Order Number Valves	DN	Inches	MAX Closeoff Pressure (Pa)				
VFB025H	25	1"	1000	M9100-100A	---	M9200-100A	
VFB032H	32	1-1/4"	1000	M9100-100A	---	M9200-100A	
VFB040H	40	1-1/2"	1000	M9100-100A	---	M9200-100A	
VFB050H	50	2"	1200	M9100-100B	---	M9200-100B	
VFB065H	65	2-1/2"	1200	M9100-100B	---	M9200-100B	
VFB080H	80	3"	1200		M9100-100B	M9200-100B	
VFB100L	100	4"	350		M9100-100C	M9200-100C	

\* Linkage Ordering Code for field mounting

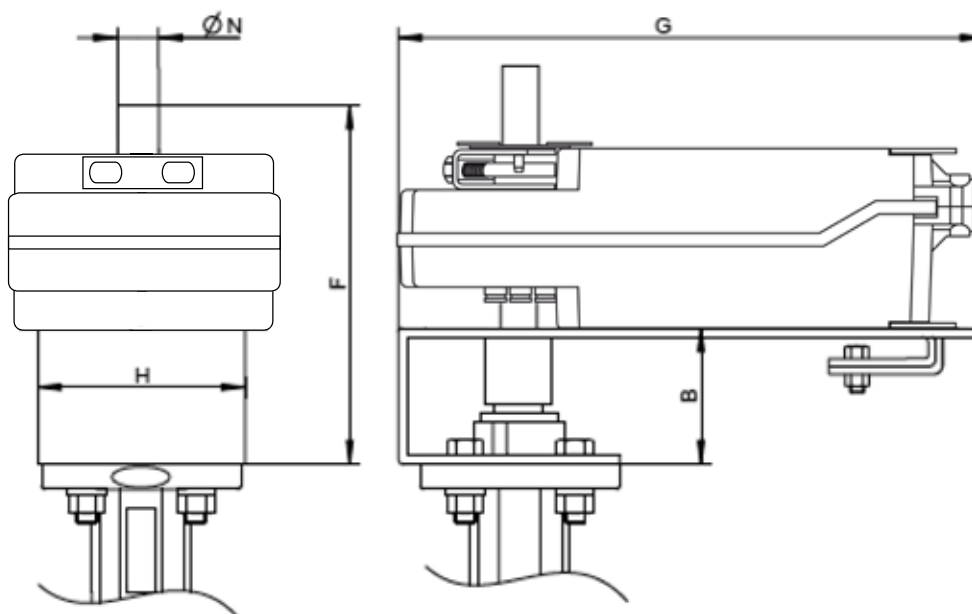




**Figure 6: VFB Series Valve actuated with M9000 series electric actuators - Dimensions in mm (See table 7)**

**Table 7**

Valve Size DN	ØN mm	H mm	F mm	B mm	G mm
25, 32, 40	19	97	135	50	195
50, 65, 80	19	97	135	50	195
100	19	97	135	50	195



**Figure 7: Two-Way VFB Series M9220 Electrically Actuated Wafer Butterfly Valve - Dimensions in mm (See table 8)**

**Table 8**

Valve Size DN	ØN mm	H mm	F mm	B mm	G mm
25, 32, 40	19	97	135	50	277
50, 65, 80	19	97	135	50	277
100	19	97	135	50	277

## Ordering Codes for factory assemblies with VA-9070 Series Actuators

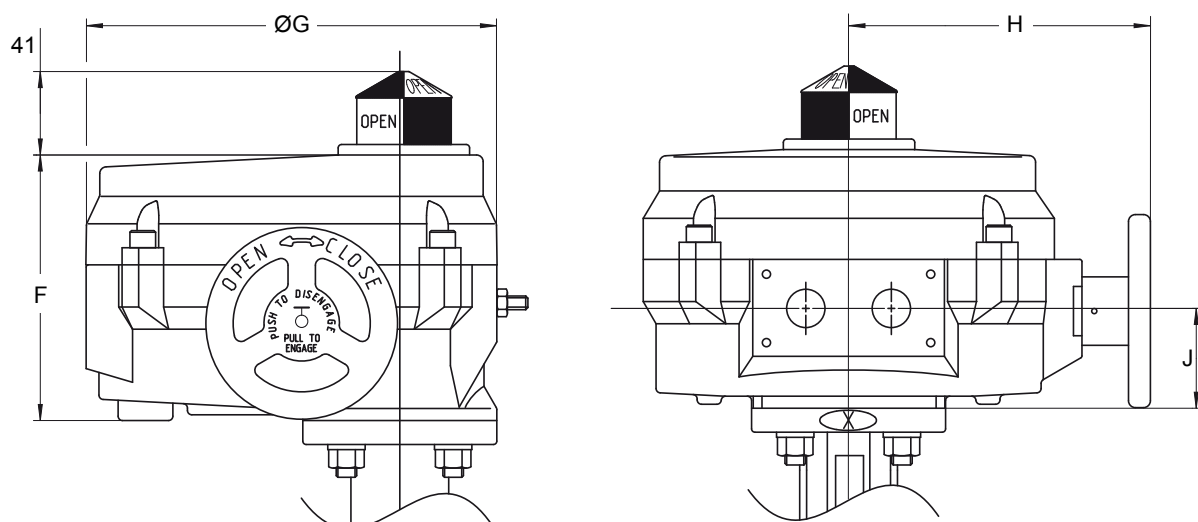
V	F	B	X	X	X	X	+	7	X	X	X
<b>Power Supply:</b> 1 = 24 VAC 2 = 230 VAC											
<b>Factory Mounted Electric Actuators:*</b> 2 = VA-9072 Series      57 Nm Actuators 5 = VA-9075 Series      226 Nm Actuators 7 = VA-9077 Series      565 Nm Actuators 8 = VA-9078 Series      735 Nm Actuators A = VA-907A Series      1470 Nm Actuators B = VA-907B Series      2034 Nm Actuators											
<b>Control:</b> 0 = Proportional 2 = ON/OFF & Floating											
Factory assembly with actuator											
<b>Closeoff:</b> H = High Closeoff Pressure L = Low Closeoff Pressure											
<b>Valve size:</b> 025 = DN25, 1 inch 032 = DN32, 1-1/4 inch 040 = DN40, 1-1/2 inch 050 = DN50, 2 inch 065 = DN65, 2-1/2 inch 080 = DN80, 3 inch 100 = DN100, 4 inch 125 = DN125, 5 inch 150 = DN150, 6 inch 200 = DN200, 8 inch 250 = DN250, 10 inch 300 = DN300, 12 inch 350 = DN350, 14 inch 400 = DN400, 16 inch 450 = DN450, 18 inch 500 = DN500, 20 inch											
Wafer Butterfly Valve Series											

\*See VA-9070 Product Bulletin for more details

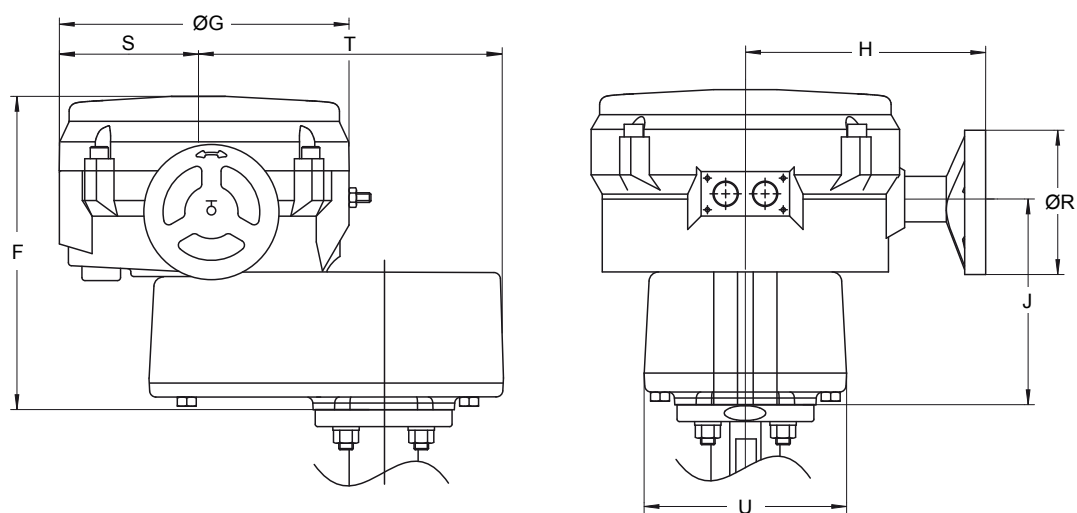
## Admitted combinations of: VBF Valves with VA-9070 Series Actuators

VFB Wafer Butterfly Valves				VA-9070 Series Actuators								
				Power supply 230 VAC					Power supply 24 VAC			
				57 Nm	226 Nm	735 Nm	1470 Nm	2034 Nm	57 Nm	226 Nm	565 Nm	
Order Number Valves	DN	Inches	MAX Closeoff Pressure (bar)	VA-9072	VA-9075	VA-9078	VA-907A	VA-907B	VA-9072	VA-9075	VA-9077	
VFB025H	25	1	12		---	---	---	---		---	---	
VFB032H	32	1-1/4	12		---	---	---	---		---	---	
VFB040H	40	1-1/2	12		---	---	---	---		---	---	
VFB050H	50	2	12		---	---	---	---		---	---	
VFB065H	65	2-1/2	12		---	---	---	---		---	---	
VFB080H	80	3	12		---	---	---	---		---	---	
VFB100H	100	4	12		---	---	---	---		---	---	
VFB125H	125	5	12		---	---	---	---		---	---	
VFB150H	150	6	12	---		---	---	---	---		---	
VFB200H	200	8	12	---		---	---	---	---		---	
VFB250H	250	10	12	---	---		---	---	---	---		
VFB300H	300	12	10	---	---		---	---	---	---		
VFB350H	350	14	10	---	---		---	---	---	---	---	
VFB400H	400	16	10	---	---	---		---	---	---	---	
VFB450H	450	18	10	---	---	---		---	---	---	---	
VFB500H	500	20	10	---	---	---	---		---	---	---	
VFB100L	100	4	3.5		---	---	---	---		---	---	
VFB125L	125	5	3.5		---	---	---	---		---	---	
VFB150L	150	6	3.5		---	---	---	---		---	---	
VFB200L	200	8	3.5	---		---	---	---	---		---	
VFB250L	250	10	3.5	---		---	---	---	---		---	
VFB300L	300	12	3.5	---	---		---	---	---	---		
VFB350L	350	14	3.5	---	---		---	---	---	---		
VFB400L	400	16	3.5	---	---		---	---	---	---		
VFB450L	450	18	3.5	---	---		---	---	---	---		
VFB500L	500	20	3.5	---	---		---	---	---	---	---	

See VA-9070 Product Bulletin for more details.



**Figure 8: Two-Way VFB Series actuated with VA-9072 / VA-9075 / VA-9077 / VA-9078 Actuators**  
**Dimensions in mm (See table 9)**



**Figure 9: Two-Way VFB Series actuated with VA-907A / VA-907B Actuators - Dimensions in mm (See table 9)**

**Table 9**

Actuator Model	F mm	G mm	H mm	J mm	S mm	T mm	R mm	U mm	Top flange
VA-9072	130	191	142	48	-	-	-	-	F07
VA-9075	165	257	198	64	-	-	-	-	F07/F12
VA-9077 / VA-9078	183	307	241	74	-	-	-	-	F12/F16
VA-907A / VA-907B	317	307	241	206	155	323	305	203	F12/F16

## Technical Specifications VFB Series Valves

<b>Product</b>	VFB Butterfly Valves	
<b>Service</b>	Cooled and heated water with 50% Glycol vol. max. Well water, saltwater	
<b>Pipe Connection</b>	<b>DN25 to DN400</b>	Flange PN6/PN10/PN16
	<b>DN450 to DN500</b>	Flange PN10/PN16
<b>Fluid Temperature Limits</b>	-29 °C to 121 °C	
<b>Ambient Temperature Limits</b>		
	<b>- Transport / Storage</b>	-20 °C to 80 °C, dry and dust free, not exposed to strong sunlight
<b>Pressure Rating</b>	16 Bar	
<b>Actuator Mounting Flange</b>	As per ISO 5211	
<b>Maximum Closeoff Pressure</b>		
	<b>DN25 to DN40</b>	1.000 kPa
<b>VFBxxxH</b>	<b>DN50 to DN300</b>	1.200 kPa
	<b>DN350 to DN500</b>	1.000 kPa
<b>VFBxxxL</b>	<b>DN100 to DN 500</b>	350 kPa
<b>Maximum Fluid Velocity</b>	4 m/s	
<b>Leakage</b>	Gas tight leak rate A (EN12266-1)	
<b>Flow Characteristics</b>	Modified Equal Percentage	
<b>Flow Coefficients (Kvs)</b>	See page 3	
<b>Materials</b>		
	<b>- Body</b>	ASTM A 126 Class B ≈ GG 25
	<b>- Stem</b>	ASTM A582 Type 416 ≈ 1.4405
	<b>- Primary and secondary seal</b>	EPDM
	<b>- Disc</b>	ASTM A 351 CF8M ≈ 1.4408 (DN25 to DN40) ASTM A-536 grade 65-42-12 ≈ GGG40 with Nylon 11 coating (DN50 to DN500)
	<b>- Steam seal</b>	Buna-N strengthened
	<b>- Stem bushing</b>	Polyacetal
	<b>- Locking ring (only for DN50 to DN500)</b>	Galvanized steel spring
	<b>- Shaft lock (only for DN50 to DN500)</b>	CrNiMo- steel
	<b>- Spacer (only for DN50 to DN500)</b>	CrNiMo- steel
<b>Ambient Temperature Limits</b>		
	<b>- Transport / Storage</b>	-20 °C to 80 °C, dry and dust free, not exposed to strong sunlight
<b>Compliance</b>		
	<b>CE - Europe</b>	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the PED (Pressure Equipment Directive) 97/23/EC, Category I