

## VBF Series

## Electric Motor-Driven Butterfly Valves

**Features and Benefits**

- Compact wafer-type body (fits between pipe flanges)  
Light weight and easy to install: reduces structural support needs and allows a single person to handle and install the valve easily.
- Short face-to-face length  
Space and cost savings: requires less pipe space and weighs significantly less than gate or ball valves, lowering overall system cost.
- Quarter-turn operation (0° to 90°)  
Fast and simple actuation: allows for rapid opening and closing. Can be operated manually with a handwheel operator or easily automated with an electric actuator.
- Concentric disc design  
Versatile sealing: concentric design is cost-effective.
- Replaceable resilient seat  
Low maintenance and leak-free: the soft seat creates a bubble-tight seal. If worn, only the seat needs replacement, saving time and money.
- Stainless steel disc and EPDM liner  
Suits water applications
- Actuator mounting flange and stem connection  
Simple installation: designed for direct mounting of actuator via a bracket and a coupling
- Blow-out proof stem  
Enhanced safety: the stem is mechanically locked in place, preventing it from being forcibly ejected under high pressure and avoiding hazardous leak.

**General**

The Mega Controls VBF Series electric motor-driven resilient seated butterfly valves deliver bidirectional bubble-tight shutoff and long-term reliability for hydronic systems. Designed with a one-piece wafer body and flange locating holes, these valves feature a high-strength through stem design and an internal disc-to-stem connection that eliminates leak paths and ensures dependable sealing performance.

The VBF Series butterfly valves are designed specifically for the HVAC market and are ideal for all automatic temperature control applications using chilled or hot water. They are typically used for isolating or throttling water flow in large pipes,



offering a compact and lightweight solution criteria specific to HVAC applications. Their wafer design relies on the connected pipe flanges to compress and hold the valves in place. They are not designed for dead-end service, meaning they cannot hold back pressure at the end of a pipeline without the downstream flange in place.

The VBF Series butterfly valves are equipped with electric rotary-motion actuators of 3-wire on-off/floating or 2-wire modulating control actions. The actuators are available with 24 or 230 V 50/60 Hz power supply. All actuators include a clutch-type handwheel operator for manually positioning the valve when the actuator is not powered.

**Auxiliary Switches (On-Off/Floating Models Only)**

The on-off/floating valves are available with two built-in auxiliary switches that allow setting at 0° (fully-closed) and 90° (fully-open) positions.

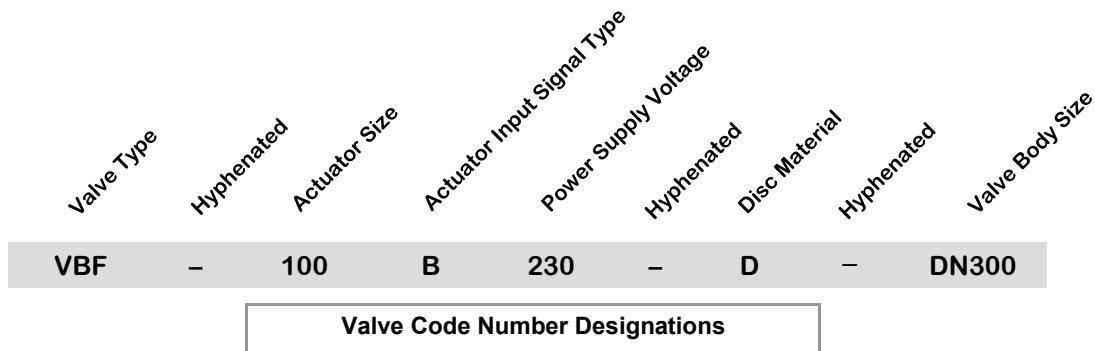
**Feedback Signal (Modulating Models Only)**

The modulating valves are provided with a 0-10 Vdc (default) or 4-20 mA (optional) position feedback signal.

**Ordering**

To order, specify complete model numbers. If 4-20 mA input signal and/or position feedback signal are required for the butterfly valve, specify this requirement on ordering, as factory needs to carry out some changes on the actuator control board to accomplish this.

**Fig. 1: Valve Code Number Selection Guide**



**Valve Type**

VBF = VBF Series butterfly valves

**Actuator Size**

- 05 = for valve bodies DN50, DN65 and DN80
- 10 = for valve bodies DN100 and DN125
- 25 = for valve bodies DN150 and DN200
- 50 = for valve body DN250
- 100 = for valve bodies DN300 and DN350
- 200 = for valve bodies DN400, DN450 and DN500

**Actuator Input Signal Type**

- B = 3-wire on-off/floating input
- E = 2-wire modulating input of 0-10 Vdc (default) or 4-20 mA (optional)

When ordering the body and actuator unassembled, enter the code numbers as two separate items, example: VBF-100B230 (actuator) and VBF-D-DN300 (valve body).

**Power Supply Voltage**

- 024 = 24 V 50/60 Hz ±10%
- 230 = 230 V 50/60 Hz ±10%

**Disc Material**

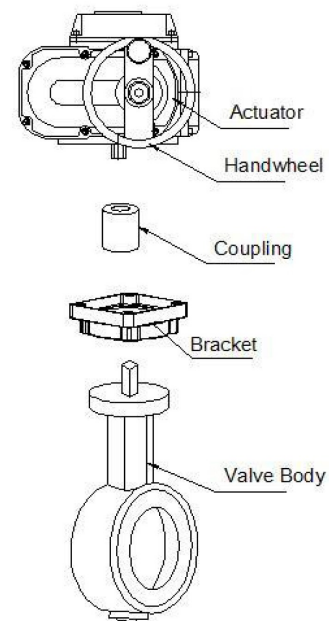
D = 304 stainless steel

**Valve Body Size**

- DN050 = DN50 (2")
- DN065 = DN65 (2-1/2")
- DN080 = DN80 (3")
- DN100 = DN100 (4")
- DN125 = DN125 (5")
- DN150 = DN150 (6")
- DN200 = DN200 (8")
- DN250 = DN250 (10")
- DN300 = DN300 (12")
- DN350 = DN350 (14")
- DN400 = DN400 (16")
- DN450 = DN450 (18")
- DN500 = DN500 (20")

**Valve Installation**

1. Position the disc in the partially open position, maintaining the disc with the body face to face.
2. Place the body between flanges and install flange bolts. *Do not use flange gaskets.*
3. Before tightening flange bolts, carefully open the disc to the full open position to ensure proper alignment and clearance of the disc O.D. with the adjacent pipe I.D.
4. Leave the disc in the full open position and tighten flange bolts per required specification. Once bolts are tightened, carefully rotate the disc to closed position to ensure disc O.D. clearance.
5. Install the coupling and bracket onto the valve body, if not already done in the factory.
6. Insert the output shaft into the square hole of the coupling and tighten the screws between the motorized actuator and the bracket.
7. Move the actuator with the handwheel operator and ensure that the movement is parallel and no skewing, and avoid over traveling.



## Specifications

Product model numbers	See Fig. 1: Valve Model Number Selection Guide	
Valve body pressure rating	16 bar (230 PSI)	
Body sizes	50 to 500 mm (2" to 20" )	
End connections	Wafer type, to be held by pipe flanges	
Pressure testing standard	GB 13927-2022 (China), equivalent to ISO 5208-2015	
	Shell strength test: 2.4 bar (348 PSI); Sealing test (liquid): 17.6 bar (255 PSI)	
Valve standards	PN designation: EN 12266; class designation: API 598;	
Water temperature limits	≤ 120°C (248°F)	
Service	Chilled and Hot Water, up to 50% glycol solutions	
Flow coefficient values	See Fig. 3: Flow Coefficient (Kv Values)	
Flow characteristic	Non-linear, equal percentage	
Seat leakage	Bubble-tight shutoff	
Stroke	90°±5°	
Maximum close-off pressure	16 bar	
Protection class	IP67	
Agency approval	CE Mark Compliant pending	
Ambient temperatures	Operating: -10 to 50°C (14 to 122°F); 0-95% RH, non-condensing; Storage: -25 to 60°C (-13 to 140°F);	
Dimensions and shipping weights	See Fig. 4: Dimensions and Weights	
Valve construction materials	Bushing	Copper-based powder metallurgy
	Disc	304 stainless steel
	Seat	EPDM
	Body	QT450 nodular cast iron
	Bolt	304 stainless steel
	Stem	12Cr13 stainless steel
	Retaining ring	304 stainless steel
	O-ring	Viton
	Actuator housing	Polyester powder coated die-casting aluminum alloy
Rotary actuator	Power supply	24 or 230 V 50/60 Hz for all models
	Input signals	3-wire 24 or 230 Vac for on-off/floating models; 2-wire 0-10 Vdc (default) or 4-20 mA (optional) for modulating models;
	Input impedances	Modulating models: 45,000 Ω for 0-10 Vdc input
	Feedback signal	Modulating models only: 0-10 Vdc (default) or 4-20 mA (optional) for 90° span, maximum 5 mA
	Auxiliary switches	3-wire on-off/floating models only: 2 x SPST switches for end-of-travel position indication, 12(3) A 250 Vac
	Motor insulation	Class F
	Other technical data	See Fig. 2: Rotary Actuators - Technical Data

*The performance specifications above are nominal and subject to tolerances and application variables of generally acceptable industry standards. The manufacturer shall not be liable for damages resulting from misapplication or misuse of its products.*

**Fig. 2: Rotary Actuators - Technical Data**

Description	Actuator Model Numbers for 24 Vac Power Supply					
	VBFD05_024	VBFD10_024	VBFD25_024	VBFD50_024	VBFD100_024	VBFD200_024
Voltage (Vac)	24	24	24	24	24	24
Motor Power (W)	10	23	50	90	110	110
Running current (A)	2.2	3.0	5.0	8.0	9.0	9.0
Starting current (A)	11	15	25	40	45	45
Torque (Nm)	50	100	250	500	1000	2000
Operating time at 50 Hz	24 s	30 s	30 s	30 s	60 s	110 s
Angle of rotation	0~90°±5°	0~90°±5°	0~90°±5°	0~90°±5°	0~90°±5°	0~90°±5°
Fuse rating for disconnect switch (A)	24	47	52	60	60	60
Recommended 230/24 Vac isolating step-down transformer rating (VA)	220	300	500	800	1000	1000

Description	Actuator Model Numbers for 230 VAC Power Supply					
	VBFD05_230	VBFD10_230	VBFD25_230	VBFD50_230	VBFD100_230	VBFD200_230
Voltage (Vac)	230	230	230	230	230	230
Motor Power (W)	10	23	50	90	110	110
Running current (A)	0.24	0.32	0.48	0.92	1.20	1.20
Starting current (A)	0.25	0.48	0.86	1.38	2.30	2.30
Torque (Nm)	50	100	250	500	1000	2000
Operating time at 50 Hz	24 s	30 s	30 s	30 s	60 s	110 s
Angle of rotation	0~90°±5°	0~90°±5°	0~90°±5°	0~90°±5°	0~90°±5°	0~90°±5°
Fuse rating for disconnect switch (A)	3	5	7	7	10 A	10 A

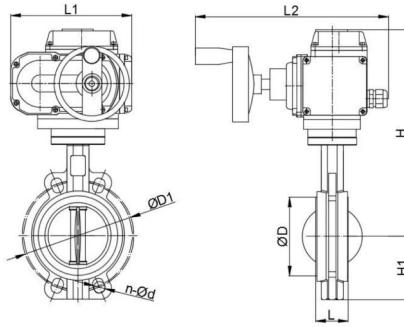
**Fig. 3: Flow Coefficient (Kv Values)**

Valve size	Disc position (fully open when at 90°)								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
DN40	0.05	2.6	6	13	23	38	60	90	99
DN50	0.05	2.6	6	13	23	38	60	90	99
DN65	0.09	5	10	21	39	64	102	153	168
DN80	0.17	8	15	33	60	99	157	236	259
DN100	0.26	15	31	67	119	197	312	468	514
DN125	0.43	25	52	114	203	336	531	797	876
DN150	0.69	39	81	176	314	518	821	1231	1353
DN200	1.7	76	161	350	623	1030	1631	2446	2687
DN250	2.6	129	274	595	1060	1754	2776	4164	4576
DN300	3	201	424	919	1638	2710	4289	6433	7069
DN350	5	290	613	1327	2366	3914	6195	9292	10212
DN400	7	398	842	1825	3254	5383	8519	12779	14043
DN450	9	527	1116	2418	4308	7129	11284	16925	18599
DN500	12	678	1411	3109	5540	9167	14508	21762	23914

**Notes:**

1. The Kv (Cv) value is defined as the water flow rate in m³/h (USGPM) that will flow through a valve opening with a pressure drop of 100 kPa (1 PSI) at a test water temperature of 20°C.
2. When the valve is used for opening and closing, the rated flow coefficient is selected based on a Kv value at 90° opening. When the valve is used for regulation, the rated flow coefficient is selected based on a Kv value at 70° opening. The recommended control angles are between 25° and 70° opening. The preferred angle for control valve sizing is 60° to 65°.

**Fig. 4: Dimensions and Weights**



Valve Size (mm)	Overall Dimensions (mm)					Mounting Dimensions (mm)			Valve Body + Actuator Weight (kg)	With Actuator Model Number	Actuator Weight (kg)
	L	L1	L2	H	H1	D	D1	n-Ød			
50	43	160.5	254	147.5	65	75	125	4-Ø19	4.7	VBFD05	3
65	46	160.5	254	147.5	70	88	145	4-Ø19	5.2	VBFD05	3
80	46	160.5	254	147.5	89	103	160	4-Ø19	5.5	VBFD05	3
100	52	210.5	271	167	106	134	180	4-Ø19	8.4	VBFD10	4.7
125	56	210.5	271	167	120	158	210	4-Ø19	10.0	VBFD10	4.7
150	56	210.5	271	167	132	188	240	4-Ø23	11.5	VBFD25	8.1
200	61	259	306.5	489	164	237	295	4-Ø23	22.1	VBFD25	8.1
250	68	259	306.5	514	200	291	355	4-Ø28	26.5	VBFD50	8.6
300	78	279	313	568	238	341	410	4-Ø28	50.0	VBFD100	14.4
350	78	279	313	629	280	375.5	470	4-Ø28	56.5	VBFD100	14.4
400	102	279	313	662	302	450	525	4-Ø31	82.5	VBFD200	17.4
450	114	279	313	693	335	500	585	4-Ø31	100.0	VBFD200	17.4
500	130	279	313	729	360	555	650	4-Ø34	117.0	VBFD200	17.4

**Piping, Valve Orientation and Placement**

**1. Valve Location**

Butterfly valves should be installed, if possible, a minimum of 6 pipe diameters from other line elements, i.e., elbows, pumps, valves, etc. Where the butterfly valve is connected to a check valve or pump, use an expansion joint between them to ensure that the disc does not interfere with adjacent equipment.

**2. Valve Orientation**

In general, it is recommended to install the valve with the stem in the vertical position and the actuator mounted vertically and directly above the valve. The valve should not be installed upside down.

**3. Non-Explosion Proof**

Butterfly valves are classified as non-explosion proof products and should not be installed in flammable and combustible environments.

**4. Avoidance of Splash**

Under the circumstances of splash, such as rain or foreign materials, and direct sunshine, cover should be installed to protect the entire valve.

**5. Working Space**

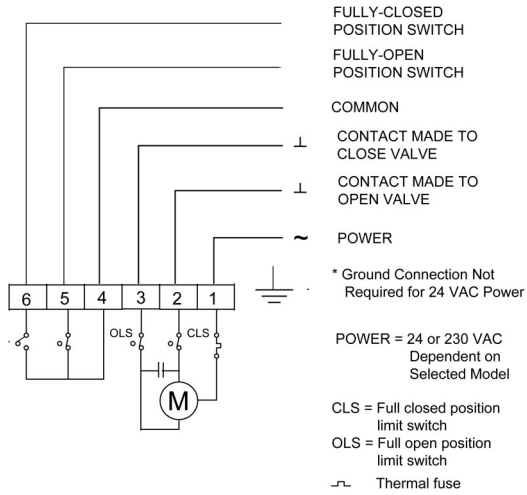
Always allow enough headroom and space for removing the valve actuator and body, for manual handwheel operation, and electrical wiring access.

**CAUTION:** Equipment Damage Hazard; do not install the actuator in atmospheres where explosive or corrosive vapors or escaping gases are present. This could result in damage to the unit.

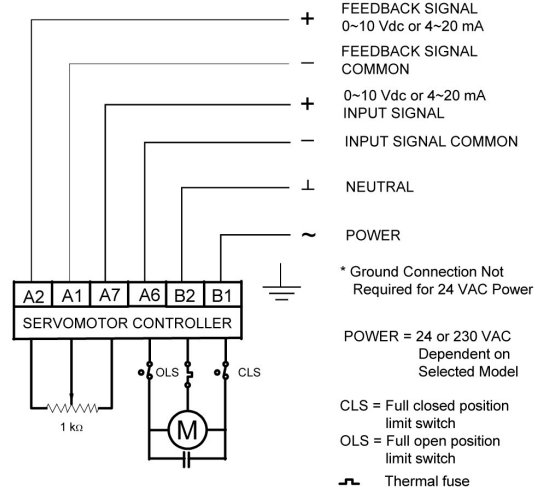
**WARNING:** All VBF Series butterfly valves are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

**Fig. 5: Wiring Diagrams**

**For 3-Wire On-Off/Floating Actuators**



**For 2-Wire Modulating Actuators**



**WARNING**

1. Since the 24 Vac valve actuator requires relatively high power, it is highly recommended that each butterfly valve should have its own isolating step-down transformer and not to be shared with other devices.
2. The power carrying wires must be properly sized to prevent significant voltage drops on actuator motor starting, which may result in improper motor operation.
3. Shielded twisted wires must be used for the analog input signal and position feedback output signal of the modulating valve actuators.
4. When installing the actuators, ensure that no water ingress into the actuator housing along the connecting cables and through their glands is possible.