YAMATAKE Specification

Medium- or Heavy-Duty Type Butterfly Control Valves

Model VBM, VBH

Butterfly control valves are normally used for the control of fluids flowing in large volume at low differential pressure. The unit offers added advantage in that it is low priced especially for large sizes, space required for mounting is small, and it is particularly efficient for controlling liquids containing slurries.

Standard specifications

Body

Type : Wafer-type butterfly valve
Material : Cast iron (FC20), Carbon steel (SCPH2), Stainless steel (SCS13, 14)
Nominal size : 100~550mm
Pressure rating : JIS 10K
End connection : Wafer type
Packing : Asbestos yarn and Teflon-lined asbestos yarn

Trim

Material :

Vane·····	Cast iron(FC 200) Carbon steel (SCPH2), Stainless steel (SCS13, 14)
Valve stem·····	Stainless steel (SUS304, 316)
Plain metal·····	Bronze(BC), Teflon, Stainless steel (SUS304 or SUS 316 with chrome plating)

Note) For fluid temperature limit, refer to Table 3, page 2.

Actuator

Type : Spring-type (Direct action) or springless-type piston actuator (Direct or reverse action)
Spring range : 0.2~1.0kgf/㎠(20~98kPa)(Spring type)
Supply pressure : 1.4kgf/㎠(140kPa)(Spring type)
2.0kgf/㎠(200kPa)(Springless type)
Air connection : Rc¼ female tap
Ambient temperature : 0~+70℃

Valve action Valve action (direct or reverse) of spring type is determined by position of the key groove provided in the connecting port between the actuator and the stem. With springless type, actuator rotation (direct or reverse) determines valve action.

Rotating angle of vane 0~60°

Standard accessories

Positioner or G・O・ Pilot, Top-mounted handwheel

Optional accessories (provided upon request)

Pressure regulator with filter, Limit switch, Motion transmitter, Volume booster, Air lock relay, and others
Note) For the optional items, refer to specification sheets and installation drawings of respective valves.

Additional specifications (by special order)

- Special inspection
  Material inspection (MILL sheet), Nondestructive inspection
- Oil-/water prohibitive treatment
- Stainless steel (SUS304), atmosphere-exposed nuts and bolts
- Approval by High-pressure Gas Control Law
- Special air piping and joints
- Saline damage countermeasures
- Tropical-area use specifications

Performance

Rated Cv value : Refer to Table 1, page2.
Flow characteristics : Refer to Fig. 1, page 2.
Inherent rangeability : 20 : 1
Permissible differential pressure :
Refer to Table 4, page 3.
Seat leakage : Refer to Table 1, page 2.
Hysteresis error : Within 1% FS(Spring type)
Within 2% FS(Springless type)
Linearity : Within±1% FS (Spring type)
Within±2% FS (Springless type)
Face-to-face and external dimensions :
Refer to Fig .2 and Table 5, page 4.
Weight : Refer to Table 5, page 4.
Finish : Grayish green(Munsell 5B4/1)or silver, or other specified colors

Table 1. Cv value and seat leakage (percentage to rated Cv value)

Valve size (mm)	Rated Cv value	Seat leakage (%)	Valve size (mm)	Rated Cv value	Seat leakage (%)
80	160	8.2	300	2,480	2.7
100	280	5.8	350	3,300	3.4
125	450	4.5	400	4,350	3.0
150	610	4.0	450	5,500	2.7
200	1,040	3.0	500	6,800	2.4
250	1,700	3.2	550	8,200	2.2

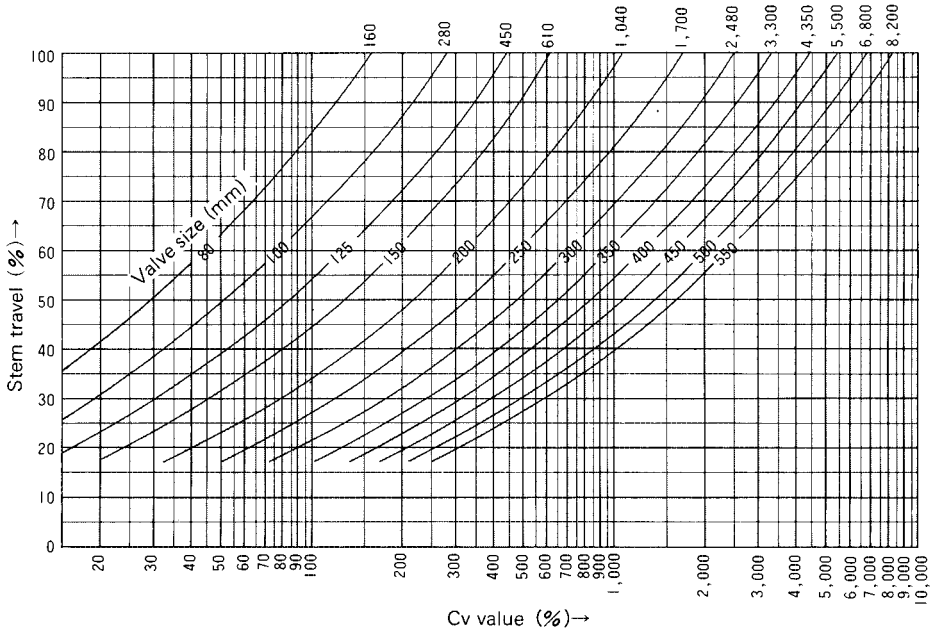
Table 2. Type of combined actuator

Model No.	Valve size (mm)	Type of actuator	Remarks
VBM	100～550	Spring-type or Springless-type G・O・Motor	With Positioner or G・O・Pilot
VBH	100～550	Springless-type G・O・Motor	With G・O・Pilot

Table 3. Material and fluid temperature limit

Model No.	Material				Operating fluid temperature (℃)
	Body	Vane	Valve stem	Plain metal	
VBM	Cast iron (FC200) Carbon steel (SCPH2) Stainless steel (SCS13,14)	FC200 (80～200mm), Carbon steel (SCPH2), Stainless steel (SCS13,14)	Stainless steel (SUS304,316)	Bronze (BC), Teflon, Stainless steel* (SUS304,316)	0～200 (With Teflon-inserted plain metal: 0～70)
VBH				Bronze (BC), Stainless steel* (SUS304,316)	0～200

Note) * : Stainless steel with chrome plating, Kanizen plating, or stellite coating



(Ideal flow characteristics are indicated in this graph.)

Figure 1. Flow characteristics

Table 4. Permissible differential pressure

Table 4-1. Model VBM

Actuator model No.			Spring type		Springless type	
			GOM103S	GOM124S	GOM64LM	GOM84LM
Valve size (mm)	Angle of vane opening		Maximum differential pressure kgf/㎠ (kPa)			
100	0° (Fully closed)		10.0 (981)			
	60° (Fully opened)	Direct action	3.2 (310)			
		Reverse action	3.5 (340)			
125	0° (Fully closed)		10.0 (981)			
	60° (Fully opened)	Direct action	1.5 (150)			
		Reverse action	2.9 (280)			
150	0° (Fully closed)		10.0 (981) 〔8.3 (810)〕			
	60° (Fully opened)	Direct action	1.0 (98)			
		Reverse action	2.0 (200)			
200	0° (Fully closed)			10.0 (981) 〔4.7 (460)〕	10.0 (981) 〔4.7 (460)〕	
	60° (Fully opened)	Direct action		0.6 (60)	0.8 (80)	
		Reverse action		0.8 (80)		
250	0° (Fully closed)			5.5 (540) 〔3.4 (330)〕	6.3 (620) 〔3.4 (330)〕	
	60° (Fully opened)	Direct action		0.3 (30)	0.5 (50)	
		Reverse action		0.5 (50)		
300	0° (Fully closed)			3.0 (290) 〔2.4 (240)〕	3.6 (350) 〔2.4 (240)〕	
	60° (Fully opened)	Direct action		0.2 (20)	0.3 (30)	
		Reverse action		0.3 (30)		
350	0° (Fully closed)			2.0 (200)		3.3 (320) 〔2.8 (270)〕
	60° (Fully opened)	Direct action		0.1 (10)		0.5 (50)
		Reverse action		0.3 (30)		
400	0° (Fully closed)			1.4 (140)		2.5 (240) 〔2.1 (200)〕
	60° (Fully opened)	Direct action		0.07 (7)		0.3 (30)
		Reverse action		0.2 (20)		
450	0° (Fully closed)			1.0 (98)		1.8 (180)
	60° (Fully opened)	Direct action		0.05 (5)		0.2 (20)
		Reverse action		0.15 (15)		
500	0° (Fully closed)			0.7 (70)		1.3 (130)
	60° (Fully opened)	Direct action		0.04 (4)		0.15 (15)
		Reverse action		0.1 (10)		
550	0° (Ffully closed)			0.5 (50)		1.0 (98)
	60° (Fully opened)	Direct action		0.03 (3)		0.11 (11)
		Reverse action		0.09 (9)		

Note) The data in〔 〕are values for Teflon-inserted plain metals.

Table 4-2. Model VBH

Valve size (mm)	Maximum differential pressure kgf/㎠ (kPa)		Actuator model No.
	Angle of vane opening		
	0° (Fully closed)	60° (Fully opened)	
100	10.0 (981)	9.0 (880)	GOM64LM
125	10.0 (981)	6.4 (630)	
150	10.0 (981)	4.2 (410)	
200	10.0 (981)	2.5 (240)	GOM84LM
250	5.5 (540)	1.27 (124)	
	10.0 (981)	0.73 (72)	
300	3.0 (290)	0.75 (74)	
	6.0 (590)	0.42 (41)	
350	3.5 (340)	0.85 (83)	GOM124LM
	7.5 (740)	0.32 (31)	
400	3.5 (340)	0.88 (86)	
	6.0 (590)	0.71 (70)	
450	2.0 (200)	0.48 (47)	
	4.0 (390)	0.25 (24)	
500	2.0 (200)	0.53 (52)	
	4.5 (440)	0.24 (24)	
550	1.2 (120)	0.30 (29)	
	2.1 (200)	0.21 (20)	

Note) See respective row for differential pressures at open and closed positions when two rows are shown for one valve size.

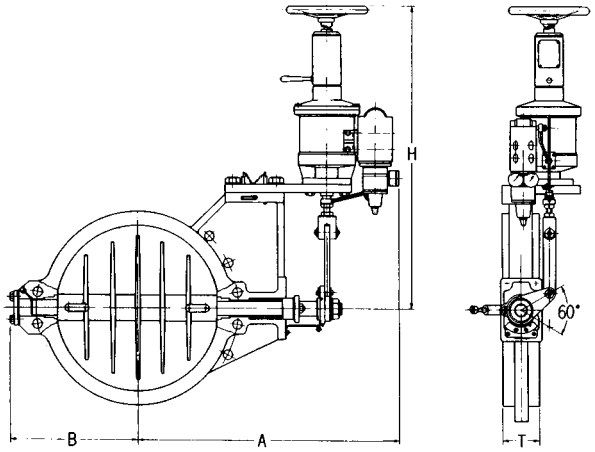


Figure 2-1. Model VBM

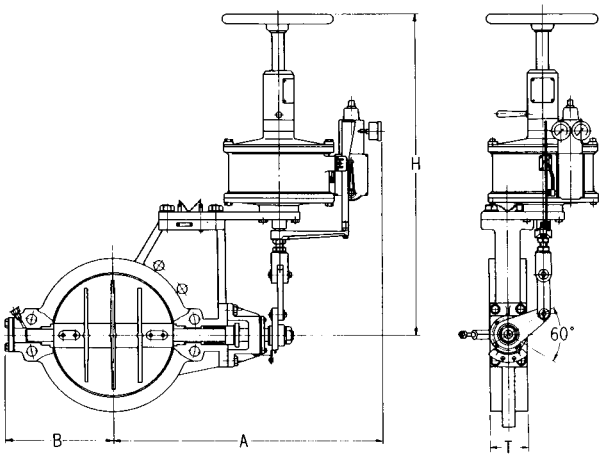


Figure 2-2. Model VBH

Figure 2. Face-to-face and external dimensions

Table 5. Face-to-face and external dimensions and weight

Table 5-1. Model VBM

Valve size (mm)	External dimensions (mm)				Weight (kg)	Actuator model No.	
	A*	B	H*	T			
100	470	140	895	80	73	GOM103S	
125	485	165	895	80	85		
150	480	180	895	80	87		
200	565	210	1,075	80	80 (120)	GOM64LM	GOM124S
250	570	250	1,075	90	100 (140)		
300	600	270	1,075	90	105 (142)		
350	670	315	1,140	100	145 (155)	GOM84LM	
400	765	330	1,170	100	190 (200)		
450	720	370	1,170	100	215 (225)		
500	820	385	1,140	110	245 (255)		
550	855	425	1,140	110	275 (285)		

Notes: 1)* : The dimensions of A and H may vary depending on actuator. The above figures show larger ones.
2) The figures in parentheses are those with GOM124S.

Table 5-2. Model VBH

Valve size (mm)	External dimensions (mm)				Weight (kg)	Actuator model No.
	A	B	H	T		
100	565	140	900	80	62	GOM64LM
125	580	165	900	80	75	
150	575	180	900	80	78	
200	605	210	940	80	115	GOM84LM
250	610	250	940	90	135	
300	640	270	940	90	140	
350	790	315	1,000	100	170	GOM124LM
400	880	330	1,030	100	220	
450	840	370	1,000	100	255	
500	835	385	1,000	110	280	
550	970	425	1,000	110	310	

Ordering Information

When ordering, please specify;

1) Basic model No. : VBM, VBH
2) Valve size
3) Material of body, vane, valve stem, and plain metal
4) Type of actuator, air to diaphragm
5) Valve action (direct or reverse)
6) Accessories (positioner, pressure regulator with filter, etc.)
7) Special requirement of oil-free treatment,copper-free treatment, etc.
8) Name of flow medium
9) Normal flow and maximum required flow
10) Pressure of flow medium, upstream and downstream pressures at maximum and minimum required flows
11) Temperature and specific gravity of flow medium
12) Viscosity of flow medium,inclusive or exclusive of slurry

Specifications are subject to change without notice.

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Yamatake (Thailand) Co., Ltd.	: Thailand	66-2-210-0900~7
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