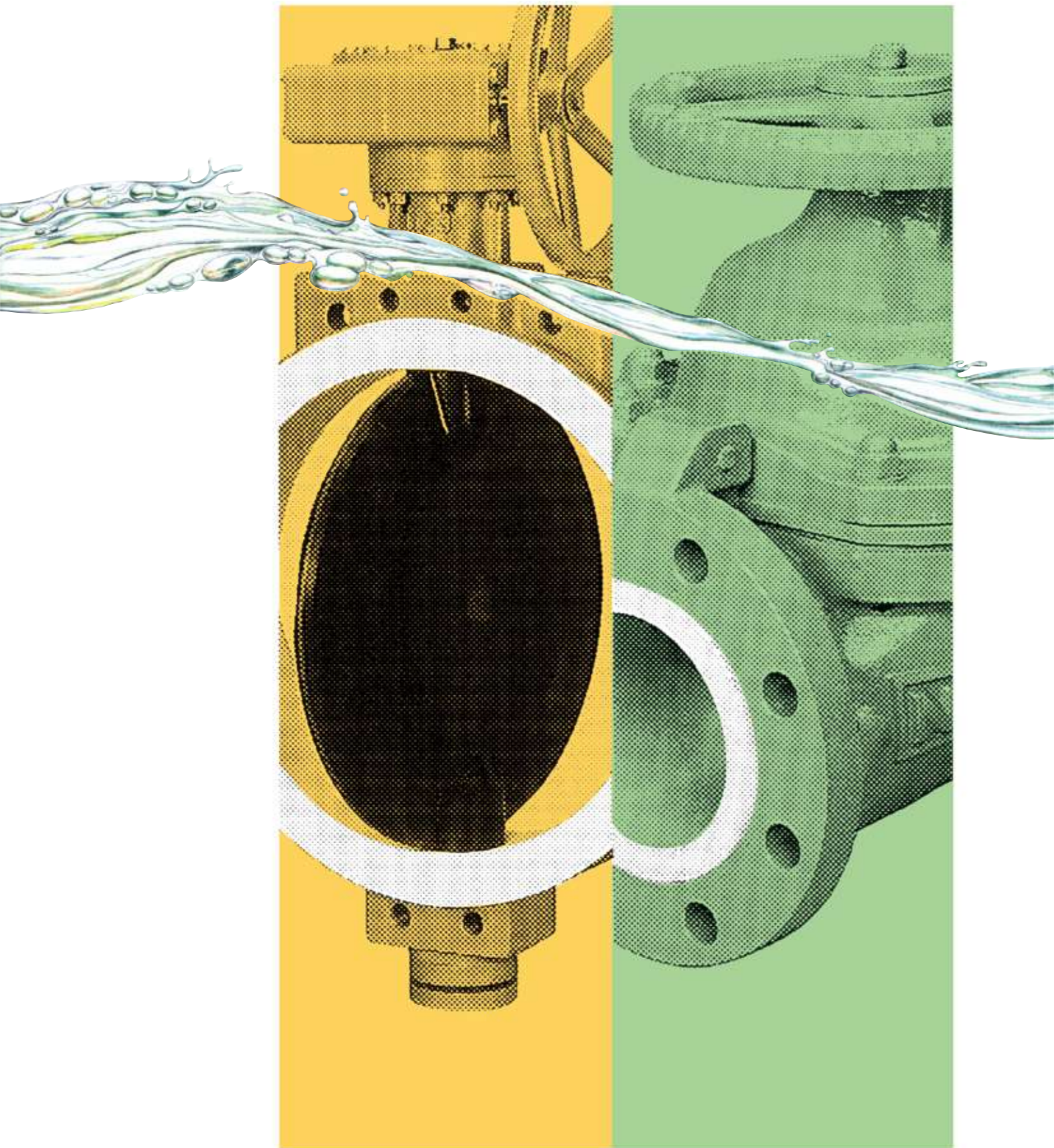




CORROSION RESISTANT VALVES

CERAMIC VALVES / CHEMFLOW VALVES



A New Future

Based on many years of experience and success, NGK produces corrosion resistant valves that are widely used in increasingly advanced and diverse industries.

NGK corrosion resistant valves have an extensive record of success going back to the 1930s in fields such as petrochemicals, general chemicals, fine chemicals, pharmaceuticals, and steel. These are products that combine superior functions and characteristics utilizing the technical strengths of NGK Insulators, Ltd., and we are confident in recommending them.

To meet the diversifying needs of the 21st century, we endeavor to deliver outstanding corrosion resistant products that utilizes our unique ceramics and high-quality fluoroplastics.

Our long experience and ideas are devoted to providing products with the highest quality.





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List of NGK Corrosion Resistant Valve Products	P3 - 4
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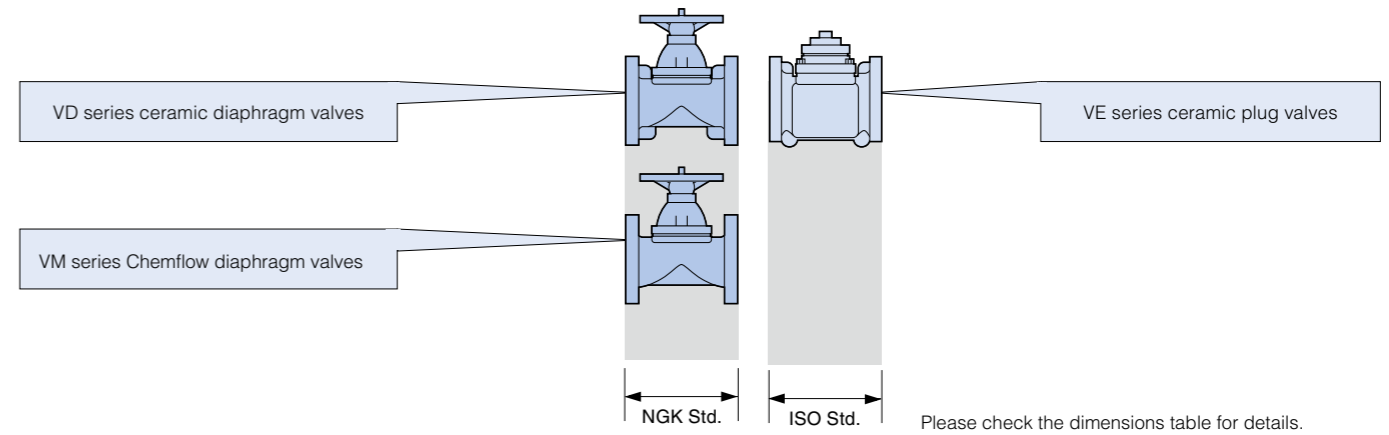
Explanation of Materials Used	P5 - 6
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Type	Lining material	Series	Manual valves	Automatic valves
Ceramic diaphragm valves	Ceramic	VD	P7 - 8	P17
Ceramic plug valves (coaxial plug type)	Ceramic	VE	P9 - 10	P21
Chemflow diaphragm valves	PFA	VM	P11 - 12	P18
Chemflow butterfly valves	PFA	VS	P13 - 14	P19
Chemflow butterfly valves	PFA	VF	P15 - 16	P20

List of NGK Corrosion Resistant Valve Products

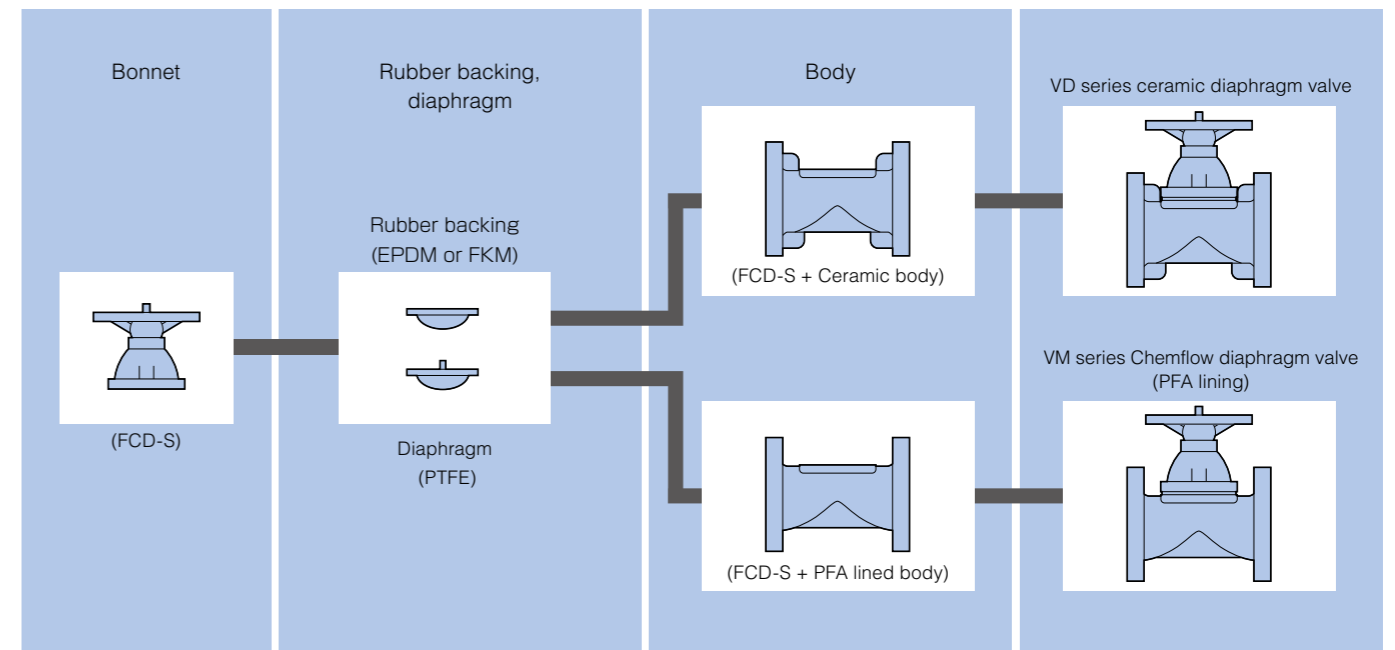
Type	Diaphragm Valve		Plug Valve	Butterfly Valve	
Series	VD	VM	VE	VS	VF
					
Main Contact Material	CERAMIC	PFA	CERAMIC	PTFE/PFA	
Size					
15A	1/2"	○	○	○	
20A	3/4"	○	○	○	
25A	1"	○	○	○	
40A	1 1/2"	○	○	○	
50A	2"	○	○	○	○
65A	2 1/2"	○	○	○	○
80A	3"	○	○	○	○
100A	4"	○	○	○	○
125A	5"	○		○	
150A	6"	○	○	○	
200A	8"	○		○	
250A	10"	○			○
300A	12"	○			○
350A	14"				○
400A	16"				○

Interchangeability of NGK Corrosion Resistant Valves



Interchangeability of Parts

Because the rubber backing, diaphragms, and bonnets of NGK diaphragm valves are interchangeable, it is possible to minimize the stock of consumable parts.



CERAMIC VALVES

Ceramic valves are highly corrosion resistant valves made of chemical industrial ceramic.

Ceramic valves utilize chemical industrial ceramic with excellent corrosion resistance and strength for the parts that contact the liquid, making them ideal for chemical processes.

In ceramic valves, the ceramic parts that contact the liquid are covered with metal armor to produce a sturdy structure.

Properties of chemical industrial ceramic

	Unit	Chemical industrial ceramic	Conventional ceramic
Color	—	Blue	White
Apparent specific gravity	—	2.5	2.3
Bending strength	(Unglazed)	122	93
	(Glazed)	137	103
Compression strength	MPa	588	490
Coefficient of thermal expansion	10 ⁻⁶ /°C	6.0	5.8
Toughness*	MPa.m ^{1/2}	0.94	0.8

(Note: The values given here are representative values from test pieces.)

* Toughness is a value indicating the fracture strength and resistance to cracking under impact load. In simple terms, it is a guideline to the "difficulty of breaking."

CHEMFLOW VALVES

Chemflow valves are highly corrosion resistant valves made of fluoroplastic.
(Chemflow is the product name of NGK fluoroplastic equipment.)

All parts of a Chemflow valve that contact the liquid are composed of fluoroplastic. Fluoroplastics are plastic materials with excellent corrosion and heat resistance, and NGK fluoroplastic pumps and valves have an extensive record of successful service.

A series of diaphragm, ball, and butterfly Chemflow valves is available, and can be used in a wide range of fields.

Characteristics of Chemflow Valves

Integral molding

All parts that contact the liquid are lined with fluoroplastic by integral molding.

As a result, because there are no welds, the linings are highly reliable.

Thick lining

Because the lining material is thick and is mechanically bonded to the metal armor, it offers excellent permeation resistance and vacuum resistance.

High sealing performance

The original NGK valve seat and gland seal structure provide superior sealing performance.

• Typical Properties of Fluoroplastics

(NGK corrosion resistant valves are manufactured using PTFE and PFA.)

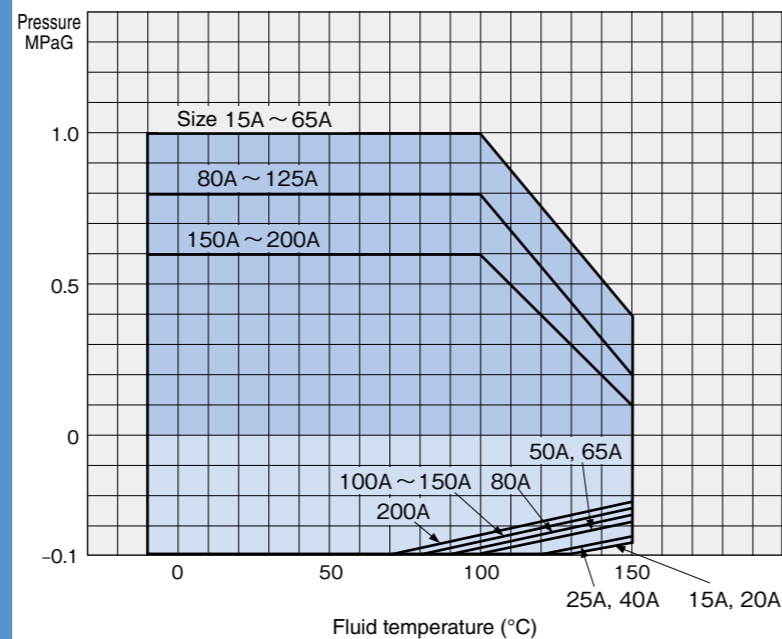
Property	Material	PTFE	PFA	FEP	ETFE	PVdF
Specific gravity		2.14 ~ 2.20	2.12 ~ 2.17	2.12 ~ 2.17	1.70	1.75 ~ 1.78
Melting point	°C	327	302 ~ 310	253 ~ 282	270	170
Tensile strength	MPa	27 ~ 34	31	20 ~ 31	45	39 ~ 51
Elongation	%	200 ~ 400	280 ~ 300	250 ~ 330	200	100 ~ 300
Compressive strength	MPa	12	—	15	49	59
Hardness	Rockwell	R25	—	R25	R50	R110 ~ R115
Thermal conductivity	W/m.K	0.25	—	0.25	0.24	0.13
Specific heat	J/kg.K×10 ³	1.0	—	1.2	1.9 ~ 2.0	1.4
Coefficient of linear expansion	1/°C × 10 ⁻⁵	9.9	12 ~ 20	8.3 ~ 10.5	9 ~ 14	8.5

<The above are typical properties of various fluoroplastics.>

Caution

This product is among the restricted product types listed in Appended Table 1 of the Export Trade Control Order. Export requires export permission based on the Foreign Exchange and Foreign Trade Act and other relevant laws.

Pressure & Temperature Range

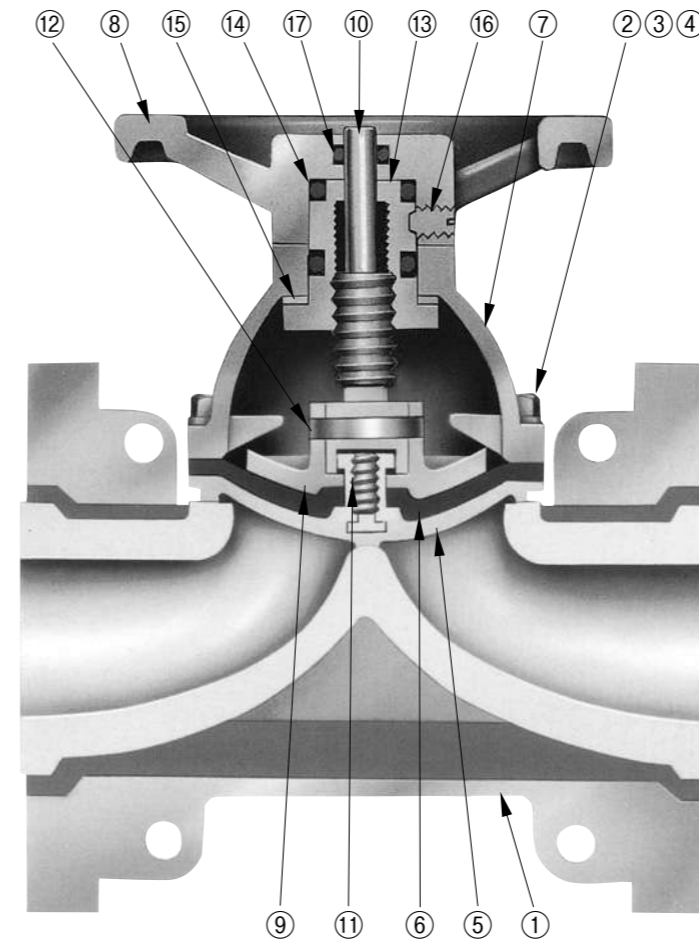


Note: Approximate diaphragm durability when used in vacuum: 4,000 open/close operations (Fluid = Air)
 Note: Service temperatures vary depending on the fluid specifications (composition, pressure) and valve open/close frequency.
 Note: If the valve will be used at temperatures of -10°C or below or 120°C or higher, be sure to consult with us. Depending on the service conditions, we may recommend FKM rubber backing.

Performance

Size (A)	Max. temp. (°C)	Allowable thermal differential (°C)	Max. pressure (MPaG)		Test pressure (MPaG)		Max. Cv value
			Gas	Liquid	Body pressure (Water)	Leak-tightness (Air)	
15	150	80	0.5	1.0	1.5	0.6	6
20							9
25							14
40							40
50							57
65							110
80			0.4	0.8	1.2	0.5	150
100							260
125							400
150							580
200	0.3	0.6	0.9	0.35	900		

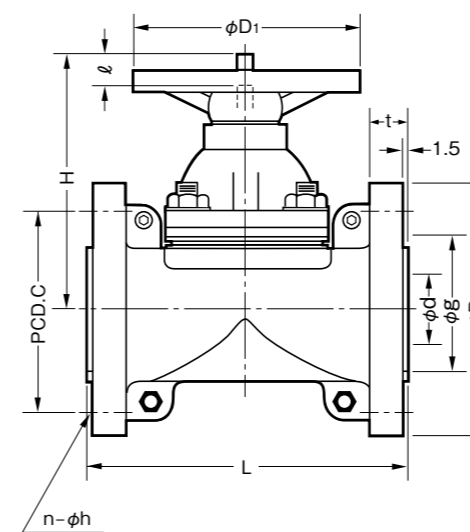
Structure & Materials



No.	Name	Material
1	Body	FCD-S + Ceramic (cement bonding)
2	Stud bolt	SS400 (Unichrome plating)
3	Hex nut	SS400 (Unichrome plating)
4	Disc spring washer	SK85-CSP
5	Diaphragm	PTFE
6	Rubber backing	EPDM (standard) + Non-asbestos joint seat FKM (option)
7	Bonnet	FCD-S
8	Handwheel	FCD-S
9	Compressor	FCD-S
10	Spindle	S45C (Unichrome plating)
11	Loose nut	C3604 BE
12	Pin	S40C
13	Sleeve	CAC202
14	O-ring	NBR
15	Washer	C3602 BE
16	Set screw	SCM435
17	O-ring	NBR

Note: In order to improve sealing performance, silicon grease is applied to the diaphragm surface that contacts the liquid. Oil-free specifications are also available upon request. (Up to 200A)
 Note: The valve may contain residual water that was used for inspection. Water-free specifications are also available upon request. (Up to 200A)
 Note: *Fitting dimensions compatible to ANSI 150lb. Flange pressure rating is 125lb.

Part Numbers & Dimensions



Unit: mm

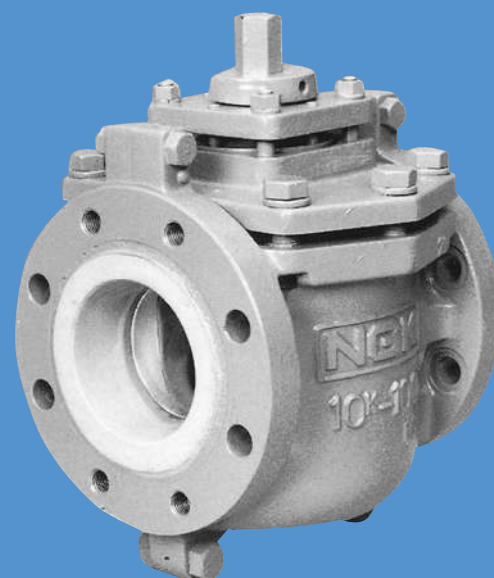
Size (A)	Part No.	d	L	H	D ₁	Flange *3						ℓ lift	Weight (kg)
						D ₂	t	g	C	n	h		
15	VD-03-S	15	135	101	90	95 (89)	13.5 (16)	35 (33)	70 (60.5)	4	15 (16)	9	4
20	VD-04-S	20	135	104	90	100 (98)	15.5 (18)	40 (40)	75 (69.9)	4	15 (16)	9	4
25	VD-05-S	25	145	118	90	125 (108)	15.5 (18)	55 (53)	90 (79.2)	4	19 (16)	12	6
40	VD-08-S	40	180	154	125	140 (127)	17.5 (20)	71 (70)	105 (98.6)	4	19 (16)	19	9
50	VD-10-S	50	210	173	155	155 (152)	17.5 (21)	83	120 (120.7)	4	19	23	13
65	VD-13-S	65	250	210	180	175 (178)	19.5 (22)	100	140 (139.7)	4	19	32	20
80	VD-16-S	80	300	255	210	185 (191)	19.5 (22)	113	150 (152.4)	8	19	36	29
100	VD-20-S	100	350	313	230	210 (229)	19.5 (24.5)	138	175 (190.5)	8	19	45	39
125	VD-25-S	125	400	348	280	250 (254)	21.5 (24.5)	162 (162)	210 (215.9)	8	23 (22)	54	56
150	VD-30-S	150	460	423	320	280 (279)	23.5 (26.5)	192 (192)	240 (241.3)	8	23 (22)	72	81
200	VD-40-S	200	520	551	400	330 (343)	23.5 (29)	243	290 (298.5)	12	19 (22)	100	140

*3: JIS 10K flange dimensions. 200A is the JIS 10K thin flange dimension. Dimensions in () are for ANSI flange

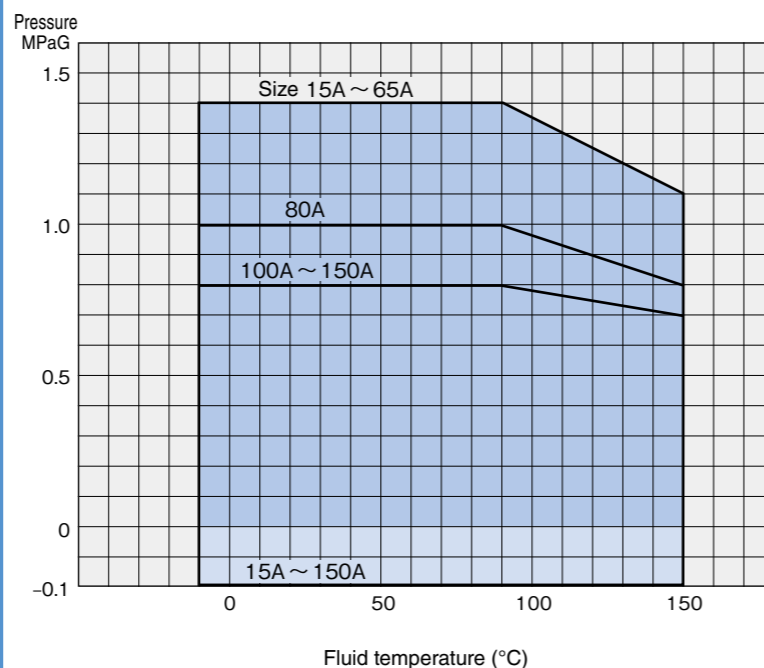
VD Series Ceramic Diaphragm Valves

- These are the most widely used corrosion resistant valves, with a body composed of high-strength ceramic and a metal cover.
- Because the flow rate is approximately proportional to the valve opening, it is ideal for automated control of flow rates.
- The bonnet part can be independently replaced while the valve itself remains installed on the pipe.

Example of application
 Flow control for corrosive liquids



Pressure & Temperature Range



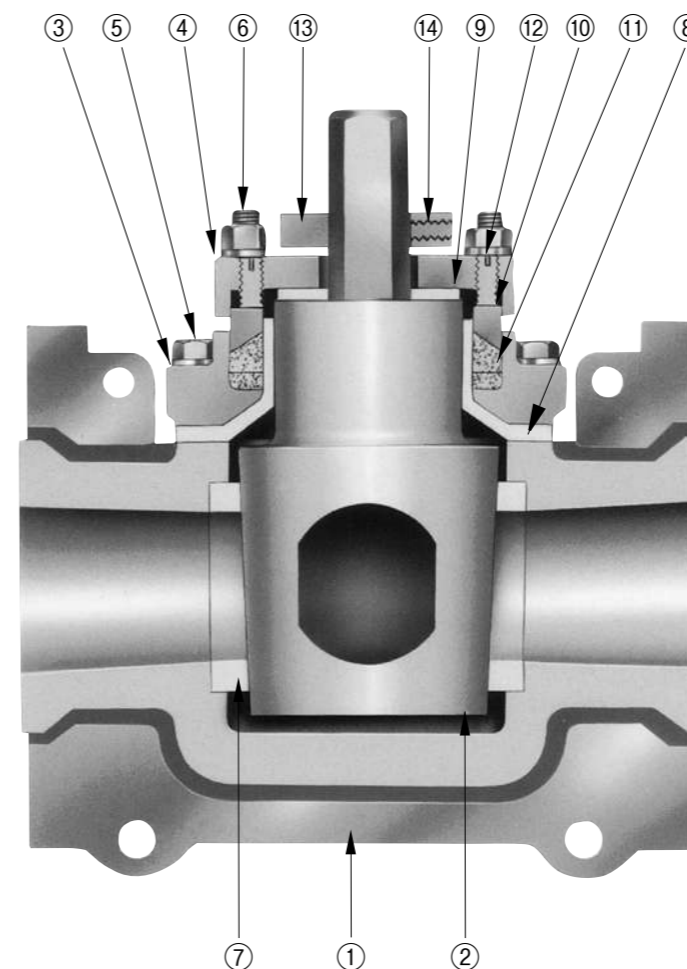
Note: Service temperatures vary depending on the fluid specifications (composition, pressure) and valve open/close frequency.

Note: If the valve will be used at temperatures of -10°C or below, be sure to consult with us.

Performance

Size (A)	Max. temp. (°C)	Allowable thermal differential (°C)	Max. pressure (MPaG)		Test pressure (MPaG)		Max. Cv value
			Gas	Liquid	Body pressure (Water)	Leak-tightness (Air)	
15	150	100	0.7	1.4	2.1	0.6	9
20							40
25							48
40							105
50							180
65							190
80	80	0.5	1.0	1.5	0.5	350	
100						530	
125						700	
150						930	

Structure & Materials



No.	Name	Material
1	Body	FCD-S + Ceramic (cement bonding)
2	Plug	S45C + Ceramic (hard lead bonding)
3	Cap	FCD-S
4	Gland holder	FCD-S
5	Hex bolt, spring washer	SUS304 (Spring washer: SUP 6)
6	Stud bolt, nut, spring washer	SUS304 (Nut: SUSXM7, spring washer: SUP 6)
7	Valve seat	PTFE with filler
8	Flare packing	PTFE
9	Thrust seat	PTFE with filler
10	Packing gland	FCD-S (SS400)
11	Gland packing	PTFE with carbon fiber
12	Hex socket head set screw	SUS304
13	Stop collar	FCD-S + SUS304 (set screw)
14	Hex socket head set screw	SUS304
15	Handle (15 - 100A)	FCD-S
*1	Actuator (150A)	FCD-S, SS400

*1: Not shown in the figure at left.

Note: In order to improve sealing performance, silicone grease is applied to sealing parts and sliding parts.

Oil-free specifications are also available upon request.

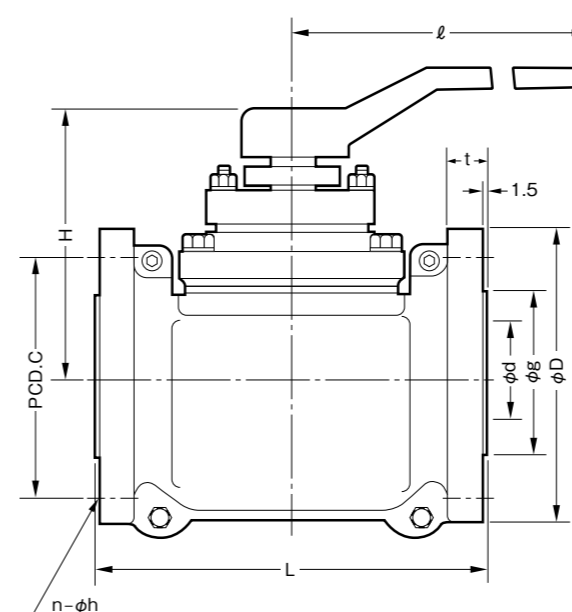
Note: The valve may contain residual water that was used for inspection.

Water-free specifications are also available upon request.

Note: Flange Type: JIS or ANSI*

*Fitting dimensions compatible to ANSI 150lb. Flange pressure rating is 125lb.

Part Numbers & Dimensions



Unit: mm

Size (A)	Part No.	d	L	H	l	Flange						Weight (kg)
						D ^{*2}	t	g	C ^{*2}	n ^{*2}	h ^{*2}	
15	VE-03	17	117	100	229	95 (89)	12 (11.5)	35	70 (60.5)	4	15 (U1/2)	4
20	VE-04	23	117	100	229	100 (98)	12 (11.5)	43	75 (69.9)	4	15 (16)	4
25	VE-05	25	127	100	229	125 (108)	15.5 (13.5)	50	90 (79.2)	4	19 (16)	5
40	VE-08	40	165	114	378	140 (127)	17.5 (16)	70	105 (98.6)	4	19 (16)	8
50	VE-10	50	178	134	378	155 (152)	17.5	80	120 (120.7)	4	19	11
80	VE-16	80	203	171	610	185 (191)	19.5 (20.5)	110	150 (152.4)	8 (4)	19 (M16)	21
100	VE-20	100	229	195	610	210 (229)	25.5	134	175 (190.5)	8 (4)	19 (M16) (19 US/8)	34
150	VE-30-G	150	267	Gear drive		280 (279)	27	192	240 (241.3)	8 (4)	23 (M20) (22 US3/4)	65

*2: JIS 10K flange dimensions. For 80A and larger, there are tap holes indicated by [] at 2 locations each on the top and bottom of the flange.

Dimensions in () are for ANSI flange

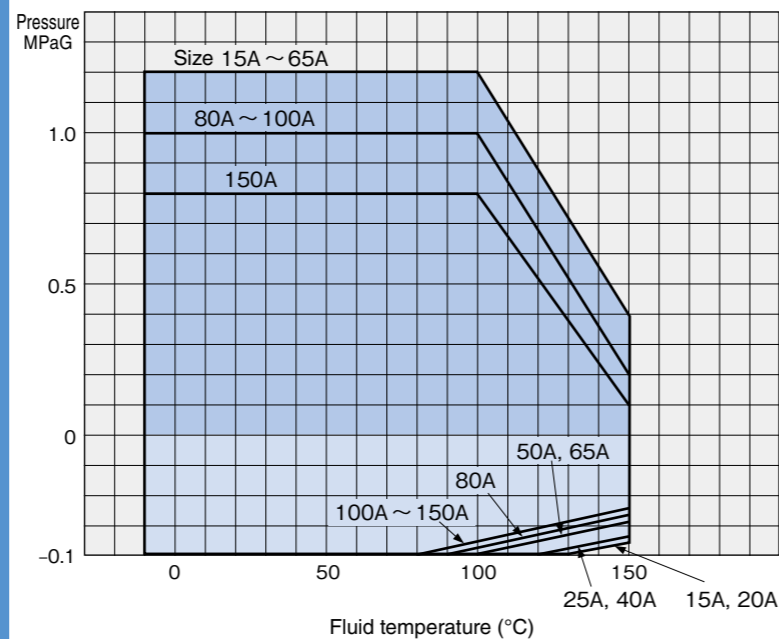
VE Series Ceramic Plug Valves (concentric plug type)

- These are straight flow valves with low valve resistance.
- The combination of ceramic and fluoroplastic at parts that contact the liquid provides high corrosion resistance.
- The valve seat uses a ceramic plug and fluoroplastic seat for smoothing opening and closing, and a secure seal of the fluid.
- Sizes are compact, with face to face distances that conform to ISO standards.

Examples of applications

Pharmaceutical and agrochemical synthesis plants
 Stack-gas desulfurization plants
 Permeable chemical and vacuum lines

Pressure & Temperature Range



Note: Approximate diaphragm durability when used in vacuum: 4,000 open/close operations (Fluid = Air)

Note: Service temperatures vary depending on the fluid specifications (composition, pressure) and valve open/close frequency.

Note: If the valve will be used at temperatures of -10°C or below or 120°C or higher, be sure to consult with us. Depending on the service conditions, we may recommend FKM rubber backing.

Performance

Size (A)	Max. temp. (°C)	Max. pressure (MPaG)		Test pressure (MPaG)		Max. Cv value				
		Gas	Liquid	Body pressure (Water)	Leak-tightness (Air)					
15	150	0.6	1.2	1.8	0.6	7				
20						7				
25						12				
40						28				
50						60				
65						130				
80		0.5	1.0	1.5	0.5	200				
100						350				
150						0.4	0.8	1.2	0.5	580

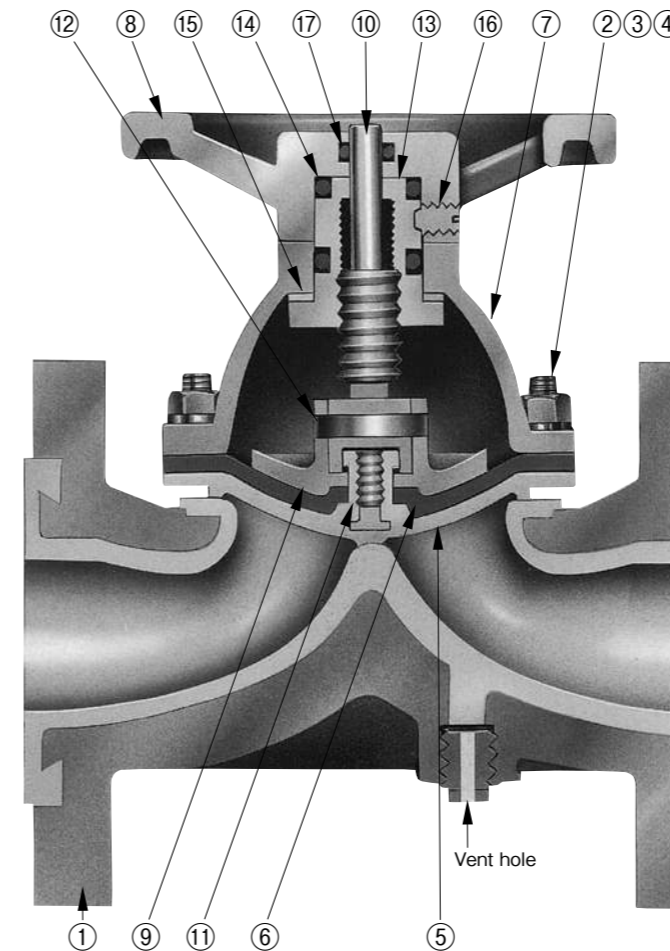
VM Series Chemflow Diaphragm Valves

- The VM series are valves with ductile cast iron armor lined with PFA, and provide particularly high corrosion and heat resistance.
- The bonnet and diaphragm are the same as the NGK VD series ceramic diaphragm valves, making it possible to minimize the stock of consumable parts.
- Even when the valve is installed flat, it is possible to angle the valve stem when installing the valve onto the pipe, allowing a pipe line with minimal residual liquid.

Examples of applications

Chemical transport lines in the electronics industry
Pharmaceutical and agrochemical manufacturing plants

Structure & Materials



No.	Name	Material
1	Body	FCD-S + PFA
2	Stud bolt	SS400 (Unichrome plating)
3	Hex nut	SS400 (Unichrome plating)
4	Disc spring washer	SK85-CSP
5	Diaphragm	PTFE
6	Rubber backing	EPDM (standard) + Non-asbestos joint seat FKM (option)
7	Bonnet	FCD-S
8	Handwheel	FCD-S
9	Compressor	FCD-S
10	Spindle	S45C (Unichrome plating)
11	Loose nut	C3604 BE
12	Pin	S40C
13	Sleeve	CAC202
14	O-ring	NBR
15	Washer	C3602 BE
16	Set screw	SCM435
17	O-ring	NBR

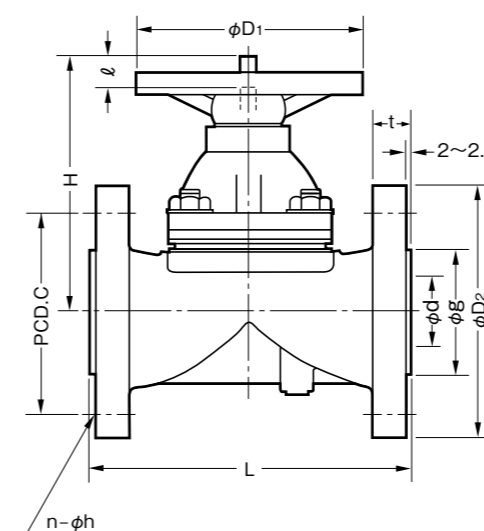
Note: In order to improve sealing performance, silicon grease is applied to the diaphragm surface that contacts the liquid. Oil-free specifications are also available upon request.

Note: The valve may contain residual water that was used for inspection. Water-free specifications are also available upon request.

Note: Flange Type: JIS or ANSI*

*Fitting dimensions compatible to ANSI 150lb. Flange pressure rating is 125lb.

Part Numbers & Dimensions



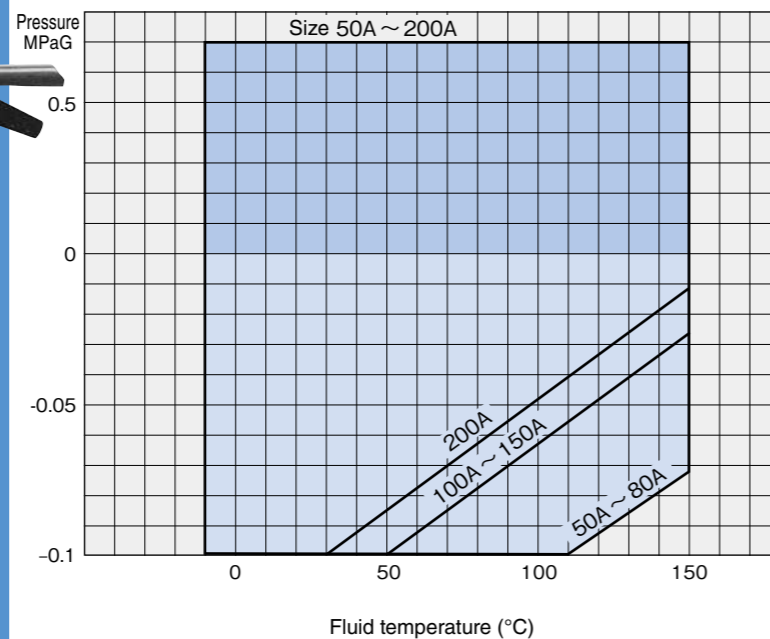
Unit: mm

Size (A)	Part No.	d	L	H	D ₁	Flange						ℓ lift	Weight (kg)
						D ₂ *	t	g	C*	n*	h*		
15	VM-03-TW	15	135	109	90	95 (89)	14 (13.5)	50 (40)	70 (60.5)	4	15 (16)	9	4
20	VM-04-TW	20	135	109	90	100 (98)	16 (15)	55 (49)	75 (70)	4	15 (16)	9	5
25	VM-05-TW	25	145	114	90	125 (108)	16 (16.5)	66 (58)	90 (79.5)	4	19 (16)	12	5
40	VM-08-TW	40	180	150	125	140 (127)	18.5 (20)	80 (77)	105 (98.5)	4	19 (16)	19	8
50	VM-10-TW	51	210	160	155	155 (152)	18 (21.5)	95	120 (120.5)	4	19	23	11
65	VM-13-TW	66	250	198	180	175 (178)	20 (24.5)	115	140 (139.5)	4	19	32	17
80	VM-16-TW	81	300	234	210	185 (191)	20 (26)	126	150 (152.5)	8 (4)	19	36	23
100	VM-20-TW	102	350	289	230	210 (229)	20 (26)	150 (166)	175 (190.5)	8	19	45	38
150	VM-30-TW	152	460	401	320	280 (279)	24.5 (28)	210	240 (241.5)	8	23 (22)	72	80

Caution
This product is among the restricted product types listed in Appended Table 1 of the Export Trade Control Order. Export requires export permission based on the Foreign Exchange and Foreign Trade Act and other relevant laws.

* JIS 10K flange dimensions
Dimensions in () are for ANSI flange

Pressure & Temperature Range



Note: Service temperatures vary depending on the fluid specifications (composition, pressure) and valve open/close frequency.

Note: If the valve will be used at temperatures of -10°C or below, be sure to consult with us.

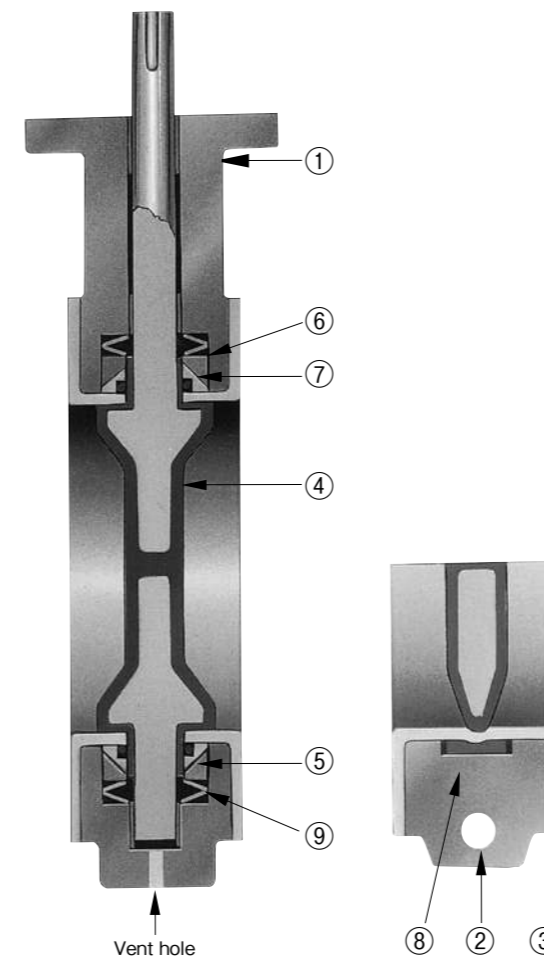
Performance

Size (A)	Max. temp. (°C)	Max. pressure (MPaG)		Test pressure (MPaG)		Max. Cv value
		Gas	Liquid	Body pressure (Water)	Leak-tightness (Air)	
50	150	0.25	0.7	1.05	0.3	120
65						120
80						290
100						450
125						800
150						1200
200						2300

Caution

This product is among the restricted product types listed in Appended Table 1 of the Export Trade Control Order. Export requires export permission based on the Foreign Exchange and Foreign Trade Act and other relevant laws.

Structure & Materials



No.	Name	Material
1	Body	FCD-S
	Bearing	DU bushing (copper alloy)
2	Body fastening bolt	SCM435
3	Body seat	PTFE
4	Valve body	S45 C+ PFA
5	Seal ring	PTFE
6	Holding bracket	SUS304
7	O-ring	FKM
8	Rubber backing	EPDM (standard), FKM (option)
9	Disc spring	SK85-CSP

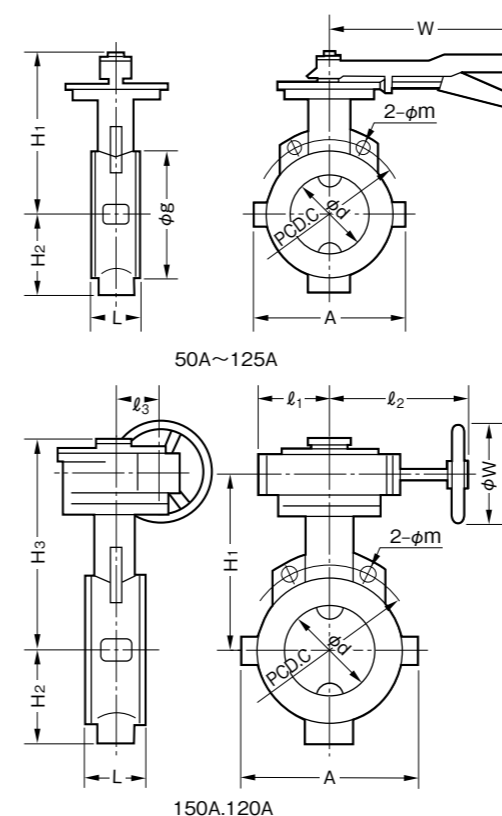
Note: In order to improve sealing performance, silicone grease is applied to sealing parts and sliding parts.

Oil-free specifications are also available upon request. (Up to 300A)

Note: Flange Type: JIS or ANSI*

*Fitting dimensions compatible to ANSI 150lb. Flange pressure rating is 125lb.

Part Numbers & Dimensions



Size (A)	Part No.	d	L	H ₁	H ₂	H ₃	l ₁	l ₂	l ₃	A	W	Flange			Weight (kg)
												C	g	m	
50	VS-10-L	59	43	152	58	—	—	—	—	112	230	120 (120.7)	100	17	4
65	VS-13-L	59	43	152	58	—	—	—	—	112	230	140 (139.7)	100	17	4
80	VS-16-NL	78	46	169	80	—	—	—	—	150	200	150 (152.4)	130	17	6
100	VS-20-NL	98	52	199	95	—	—	—	—	190	260	175 (190.5)	155	17	8
125	VS-25-NL	123	56	211	110	—	—	—	—	220	260	210 (215.9)	185	21	10
150	VS-30	148	56	225	125	274	91	247	63.5	248	200	240 (241.5)	215	21	22
200	VS-40	194	60	248	150	297	91	247	63.5	298	200	290 (298.5)	265	21	27

*JIS 10K flange dimensions

Dimensions in () are for ANSI flange

VS Series Chemflow Butterfly Valves

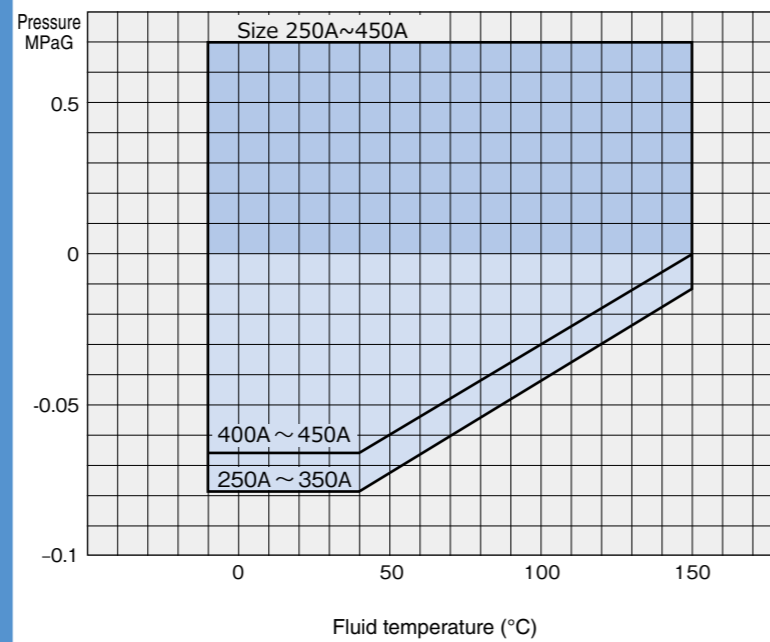
- These are compact butterfly valves with sizes up to 200A.
- All parts that contact the liquid are made of PTFE or PFA, for excellent corrosion and heat resistance.
- The original stem seal delivers superior sealing performance.
- Because there is no liquid accumulation and almost no ion elution from the lining plastic, these valves are ideal for cleaning solution lines.

Examples of applications

- High-purity chemical manufacturing plants
- Pharmaceutical and agrochemical synthesis plants
- Food industry plants



Pressure & Temperature Range



Note: Service temperatures vary depending on the fluid specifications (composition, pressure) and valve open/close frequency.

Note: If the valve will be used at temperatures of -10°C or below, be sure to consult with us.

Performance

Size (A)	Max. temp. (°C)	Max. pressure (MPaG)		Test pressure (MPaG)		Max. Cv value
		Gas	Liquid	Body pressure (Water)	Leak-tightness (Air)	
250	150	0.25	0.7	1.05	0.3	3800
300						5700
350						6600
400						9000
450						11900

Caution

This product is among the restricted product types listed in Appended Table 1 of the Export Trade Control Order. Export requires export permission based on the Foreign Exchange and Foreign Trade Act and other relevant laws.

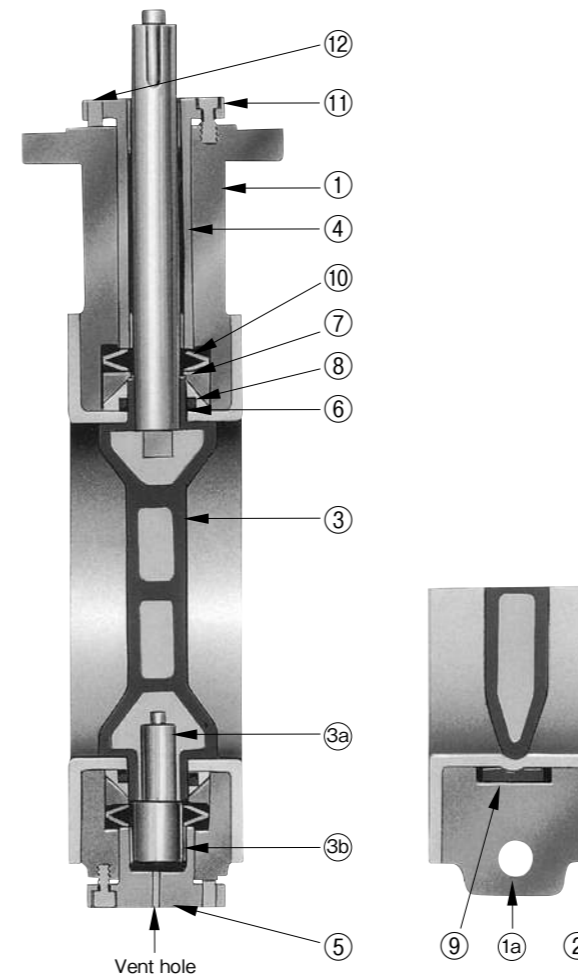
VF Series Chemflow Butterfly Valves

- Butterfly valves are ideal for lines handling large-diameter pipes of corrosive fluids.
- All parts that contact the liquid are lined with PTFE or PFA, for exceptional corrosion and heat resistance.
- The lineup covers sizes ranging from 250A to 450A, and a series of pneumatic automatic valves is also available.
- The original stem seal provides superior sealing performance and durability.

Examples of applications

- Chlorine and gas lines at electrolysis plants
- Steel sheet surface treatment plants
- Synthetic fiber manufacturing plants

Structure & Materials



No.	Name	Material
1	Body	FCD-S
1a	Body fastening bolt	SCM435
2	Body seat	PTFE
3	Valve body	FCD-S + PFA
	Upper shaft (250, 300A)	SUS420J2
	Upper shaft (350 - 450A)	SUS630
	Lower shaft (250, 300A)	SUS420J2
3a	Lower shaft (350 - 450A)	SUS630
3b	Lower shaft mounting screw (350 - 450A)	SCM435
4	Upper bushing	SS400 + DU bushing (copper alloy)
5	Lower bushing	SS400 + DU bushing (copper alloy)
6	Seal ring	PTFE
7	Holding bracket	SUS304
8	O-ring	FKM
9	Rubber backing	EPDM (standard), FKM (option)
10	Disc spring	SK85-CSP
11	Hex socket head bolt	SUS304
12	Hex socket head set screw	SUS304

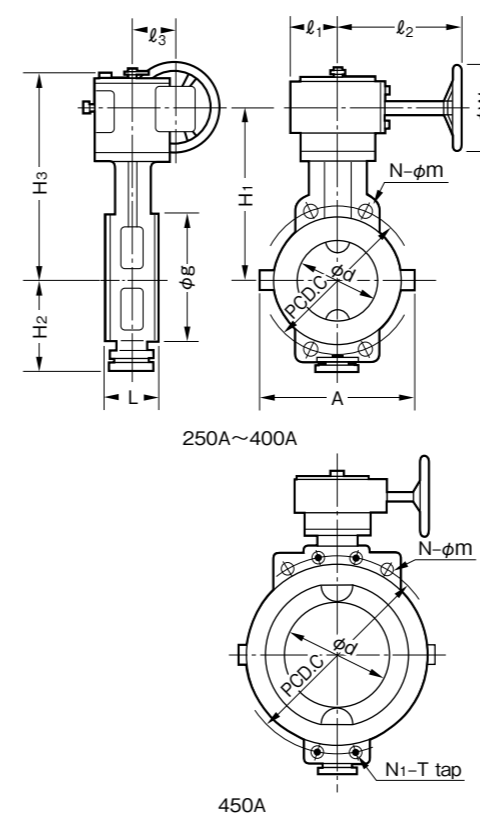
Note: In order to improve sealing performance, silicone grease is applied to sealing parts and sliding parts.

Oil-free specifications are also available upon request. (Up to 300A)

Note: Flange Type: JIS or ANSI*

*Fitting dimensions compatible to ANSI 150lb. Flange pressure rating is 125lb.

Part Numbers & Dimensions

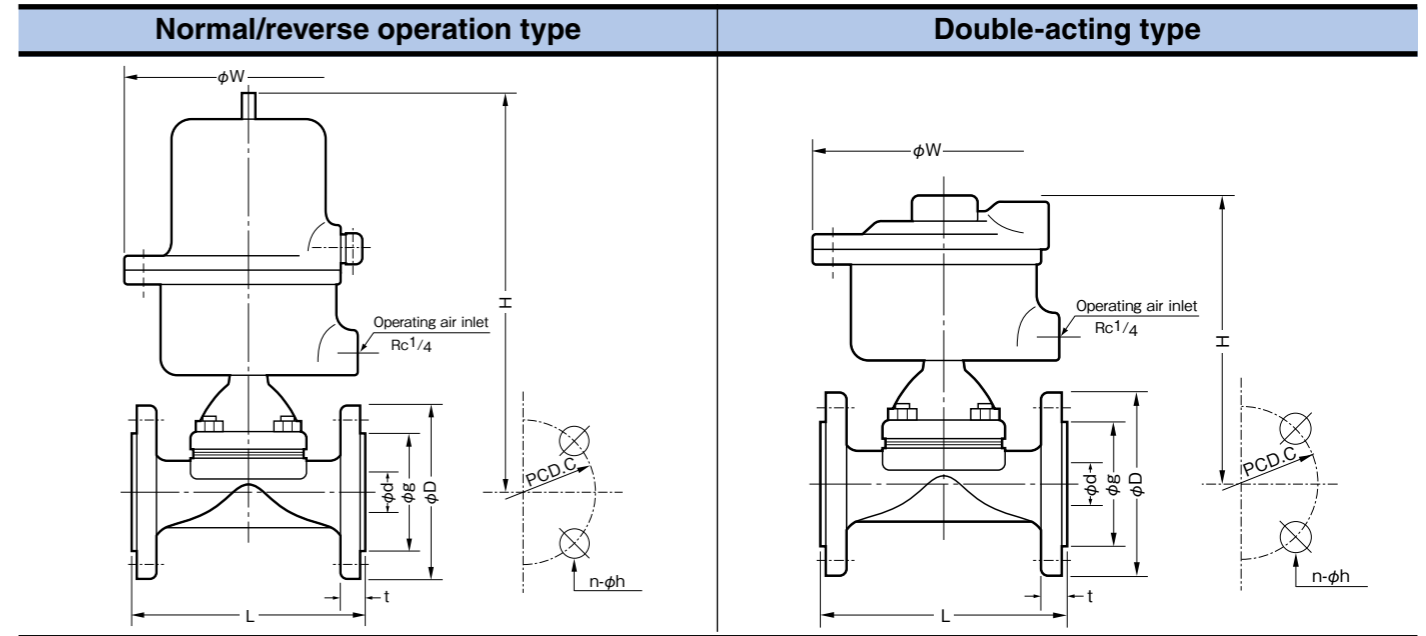
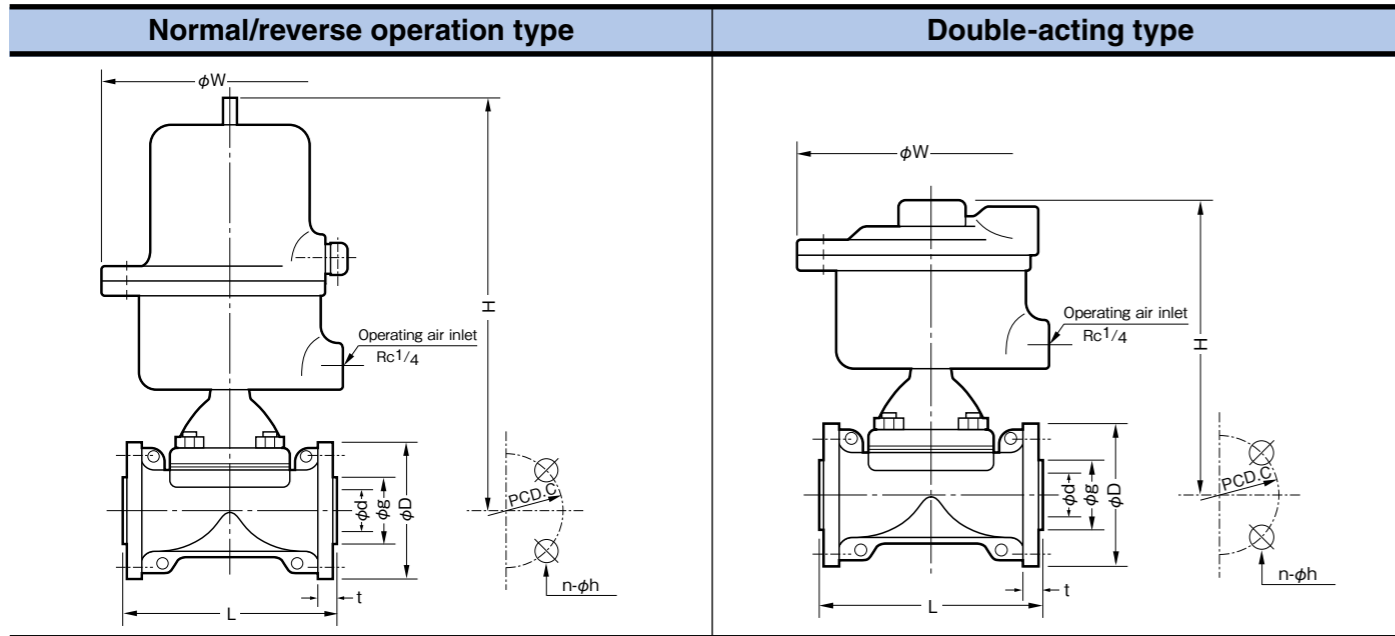


Size (A)	Part No.	d	L	H ₁	H ₂	H ₃	l ₁	l ₂	l ₃	A	W	Flange				Weight (kg)
												C*	g	N-φm	N ₁ -T	
250	VF-50	240	68	318	211	370	88	170	65.5	370	224	355 (362)	325	4-23	—	37
300	VF-60	296	78	348	239	396	88	170	65.5	414	224	400 (432)	370	4-23 (4-25)	—	43
350	VF-70	328	92	422	291	476	119	215	96	476	315	445 (476)	415	4-23 (4-27)	—	83
400	VF-80	378	102	448	317	502	119	215	96	538	315	510 (539.5)	475	4-25 (4-27)	—	101
450	VF-90	428	114	490	342	548	139	247	125.5	594	400	565 (578)	530	2-25 (2-30)	4-M24	152

*JIS 10K flange dimensions
Dimensions in () are for ANSI flange

VD Series Automatic Ceramic Diaphragm Valves

VM Series Automatic Chemflow Diaphragm Valves



Normal operation type (fail open, air to close) Unit: mm

Size (A)	Part No.	d	L	W	H	D	t	g	C	n	h	Weight (kg)	Max. pressure (MPaG)
15	VD-0343-S	15	135	180	268	95	14	35	70	4	15	10	1.00
20	VD-0443-S	20	135	180	271	100	16	40	75	4	15	10	1.00
25	VD-0543-S	25	145	180	285	125	16	55	90	4	19	11	1.00
40	VD-0844-S	40	180	232	353	140	18	71	105	4	19	19	0.90
	VD-0845-S			260	380							26	1.00
50	VD-1044-S	50	210	232	370	155	18	83	120	4	19	22	0.60
	VD-1045-S			260	400							29	0.90
	VD-1046-S			312	460							40	1.00
65	VD-1346-S	65	250	312	493	175	20	100	140	4	19	46	0.65
80	VD-1647-S	80	300	390	654	185	20	113	150	8	19	74	0.80
100	VD-2047-S	100	350	390	705	210	20	138	175	8	19	84	0.65
125	VD-2547-S	125	400	390	724	250	21	162	210	8	23	97	0.45
150	VD-3047-S	150	460	390	775	280	24	192	240	8	23	120	0.20

Reverse operation type (fail closed, air to open) Unit: mm

Size (A)	Part No.	d	L	W	H	D	t	g	C	n	h	Weight (kg)	Max. pressure (MPaG)
15	VD-0383-S	15	135	180	321	95	14	35	70	4	15	10	1.00
20	VD-0483-S	20	135	180	324	100	16	40	75	4	15	10	1.00
25	VD-0583-S	25	145	180	340	125	16	55	90	4	19	11	1.00
40	VD-0884-S	40	180	232	402	140	18	71	105	4	19	19	0.90
	VD-0885-S			260	434							26	1.00
50	VD-1084-S	50	210	232	419	155	18	83	120	4	19	22	0.60
	VD-1085-S			260	451							29	0.90
	VD-1086-S			312	504							40	1.00
65	VD-1386-S	65	250	312	537	175	20	100	140	4	19	46	0.65
	VD-1387-S			390	668							66	1.00
80	VD-1687-S	80	300	390	707	185	20	113	150	8	19	74	0.80
100	VD-2057-S	100	350	390	705	210	20	138	175	8	19	84	0.65
125	VD-2557-S	125	400	390	724	250	21	162	210	8	23	97	0.45
150	VD-3057-S	150	460	390	802	280	24	192	240	8	23	120	0.20

Double-acting type Unit: mm

Size (A)	Part No.	d	L	W	H	D	t	g	C	n	h	Weight (kg)	Max. pressure (MPaG)
15	VD-0361-S	15	135	116	149	95	14	35	70	4	15	7	0.90
20	VD-0461-S	20	135	116	152	100	16	40	75	4	15	7	0.90
25	VD-0562-S	25	145	138	186	125	16	55	90	4	19	9	0.70
40	VD-0862-S	40	180	138	212	140	18	71	105	4	19	13	0.50
	VD-0863-S			180	231							14	1.00
50	VD-1062-S	50	210	138	225	155	18	83	120	4	19	16	0.40
	VD-1063-S			180	244							17	0.90
65	VD-1363-S	65	250	180	268	175	20	100	140	4	19	24	0.30
	VD-1364-S			232	311							25	0.60
	VD-1664-S			232	347							33	0.30
80	VD-1665-S	80	300	260	408	185	20	113	150	8	19	34	0.60
	VD-2065-S			260	452							45	0.30
100	VD-2066-S	100	350	312	484	210	20	138	175	8	19	50	0.80
	VD-2565-S			260	471							59	0.20
125	VD-2566-S	125	400	312	503	250	21	162	210	8	23	63	0.60
	VD-3066-S			312	553							84	0.20
150	VD-3067-S	150	460	390	631	280	24	192	240	8	23	96	0.50
	VD-4067-S			390	720							160	0.30

Normal operation type (fail open, air to close) Unit: mm

Size (A)	Part No.	d	L	W	H	D	t	g	C	n	h	Weight (kg)	Max. pressure (MPaG)
15	VM-0343-TW	15	135	180	265	95	14	50	70	4	15	10	1.00
20	VM-0443-TW	20	135	180	268	100	16	55	75	4	15	11	1.00
25	VM-0543-TW	25	145	180	278	125	16	66	90	4	19	12	1.00
40	VM-0844-TW	40	180	232	343	140	19	80	105	4	19	19	0.90
	VM-0845-TW			260	370							27	1.00
50	VM-1044-TW	50	210	232	354	155	18	95	120	4	19	21	0.60
	VM-1045-TW			260	384							28	0.90
	VM-1046-TW			312	444							39	1.00
65	VM-1346-TW	66	250	312	474	175	20	115	140	4	19	44	0.65
80	VM-1647-TW	81	300	390	630	185	20	126	150	8	19	74	1.00
100	VM-2047-TW	102	350	390	674	210	20	150	175	8	19	82	0.80
150	VM-3047-TW	152	460	390	759	280	25	210	240	8	23	130	0.20

Reverse operation type (fail closed, air to open) Unit: mm

Size (A)	Part No.	d	L	W	H	D	t	g	C	n	h	Weight (kg)	Max. pressure (MPaG)
15	VM-0383-TW	15	135	180	318	95	14	50	70	4	15	10	1.00
20	VM-0483-TW	20	135	180	321	100	16	55	75	4	15	11	1.00
25	VM-0583-TW	25	145	180	333	125	16	66	90	4	19	12	1.00
40	VM-0884-TW	40	180	232	392	140	19	80	105	4	19	19	0.90
	VM-0885-TW			260	423							27	1.00
50	VM-1084-TW	50	210	232	403	155	18	95	120	4	19	21	0.60
	VM-1085-TW			260	434							28	0.90
	VM-1086-TW			312	488							39	1.00
65	VM-1386-TW	66	250	312	518	175	20	115	140	4	19	44	0.65
	VM-1387-TW			390	649							64	1.00
80	VM-1687-TW	81	300	390	683	185	20	126	150	8	19	74	0.80
100	VM-2057-TW	102	350	390	674	210	20	150	175	8	19	82	0.65
150	VM-3057-TW	152	460	390	786	280	25	210	240	8	23	130	0.20

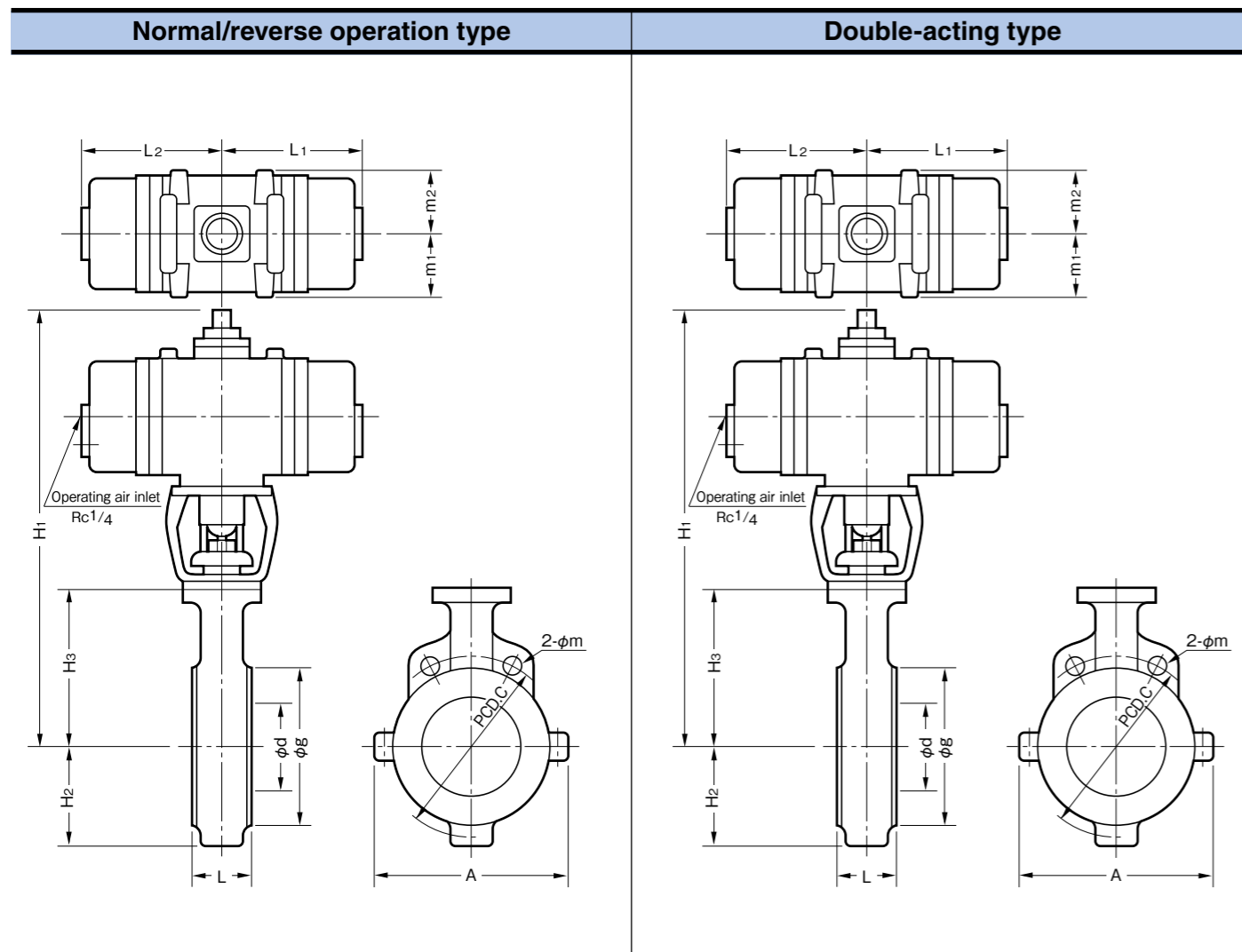
Double-acting type Unit: mm

Size (A)	Part No.	d	L	W	H	D	t	g	C	n	h	Weight (kg)	Max. pressure (MPaG)
15	VM-0361-TW	15	135	116	146	95	14	50	70	4	15	5	0.90
20	VM-0461-TW	20	135	116	149	100	16	55	75	4	15	5	0.90
25	VM-0561-TW	25	145	116	179	125	16	66	90	4	19	7	0.70
40	VM-0862-TW	40	180	138	202	140	19	80	105	4	19	10	0.50
	VM-0863-TW			180	221							11	1.00
50	VM-1062-TW	50	210	138	209	155	18	95	120	4	19	12	0.40
	VM-1063-TW			180	228							13	0.90
65	VM-1363-TW	66	250	180	249	175	20	115	140	4	19	18	0.30
	VM-1364-TW			232	292							22	0.60
80	VM-1664-TW	81	300	232	323	185	20	126	150	8	19	32	0.30
	VM-1665-TW			260	384							35	0.60
100	VM-2065-TW	102	350	260	421	210	20	150	175	8	19	43	0.30
	VM-2066-TW			312	453							48	0.80
150	VM-3066-TW	152	460	312	538	280	25	210	240	8	23	93	0.20
	VM-3067-TW			390	615							110	0.60

* Standard operating air pressure is 0.4 MPaG.

* Standard operating air pressure is 0.4 MPaG.

VS Series Automatic Chemflow Butterfly Valves



Normal/reverse operation type

Unit: mm

Size (A)	Part No.		d	L	g	C	m	A	H ₁	H ₂	H ₃	m ₁	m ₂	L ₁	L ₂	Weight (kg)
	Normal operation	Reverse operation														
50	VS-1042-F9	VS-1052-F9	59	43	100	120	17	112	349	58	115	60	60	132	132	11
65	VS-1342-F9	VS-1352-F9	59	43	100	140	17	112	349	58	115	60	60	132	132	11
80	VS-1643-F9	VS-1653-F9	78	46	130	150	17	150	422	80	125	75	75	157	157	21
100	VS-2043-F9	VS-2053-F9	98	52	155	175	17	190	445	95	148	75	75	157	157	23
125	VS-2544-F9	VS-2554-F9	123	56	185	210	21	220	486	110	160	90	90	195	195	35
150	VS-3044-F9	VS-3054-F9	148	56	215	240	21	248	534	125	185	90	90	195	195	38
200	VS-4014-F1	VS-4024-F1	194	60	265	290	21	298	563	150	208	66	132	286	540	77

Double-acting type

Unit: mm

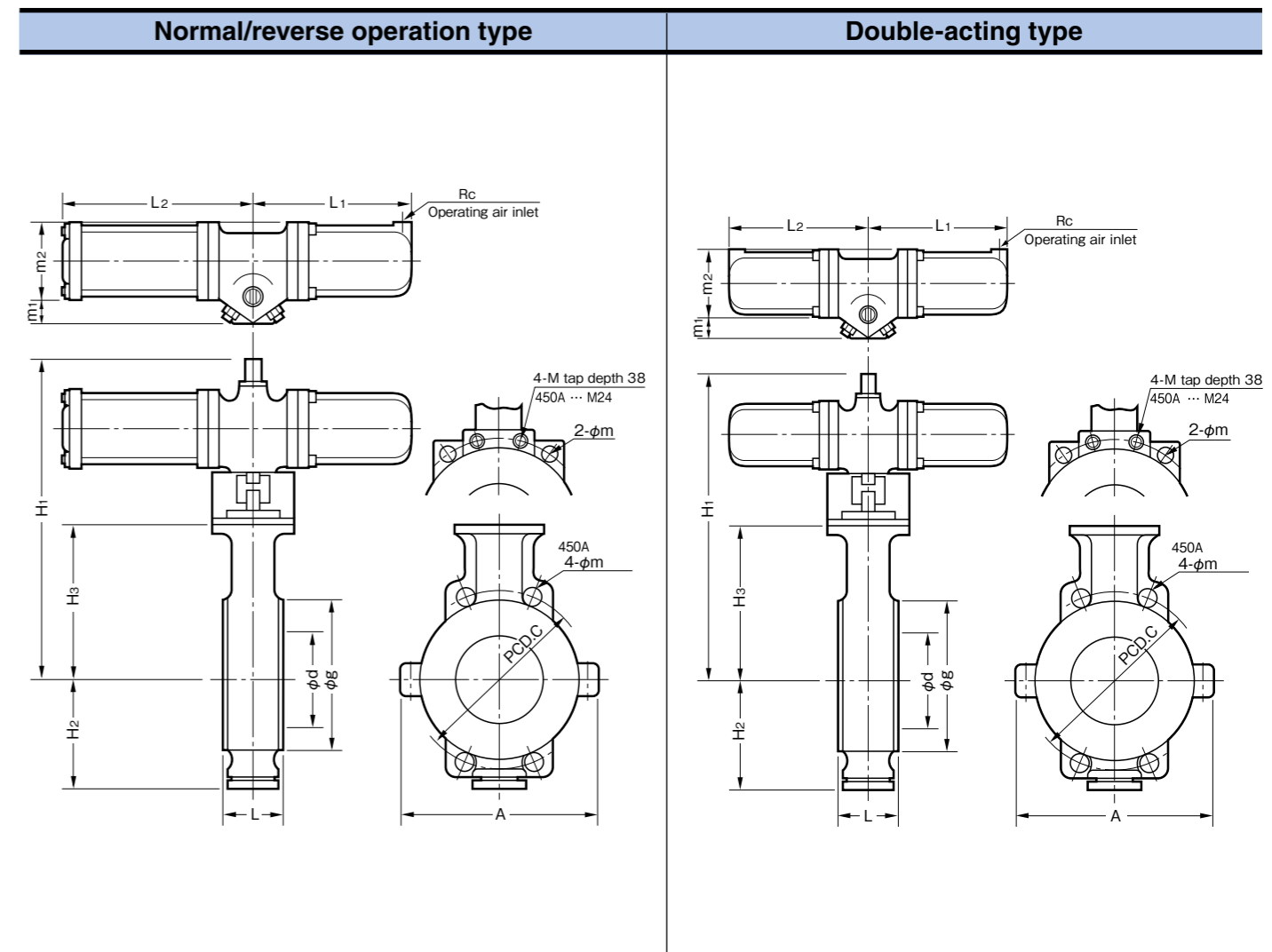
Size (A)	Part No.	d	L	g	C	m	A	H ₁	H ₂	H ₃	m ₁	m ₂	L ₁	L ₂	Weight (kg)
65	VS-1361-F9	59	43	100	140	17	112	326	58	115	50	50	116	116	9
80	VS-1662-F9	78	46	130	150	17	150	372	80	125	60	60	132	132	13
100	VS-2062-F9	98	52	155	175	17	190	395	95	148	60	60	132	132	15
125	VS-2563-F9	123	56	185	210	21	220	457	110	160	75	75	157	157	24
150	VS-3063-F9	148	56	215	240	21	248	482	125	185	75	75	157	157	27
200	VS-4064-F9	194	60	265	290	21	298	557	150	208	90	90	195	195	38

* Standard operating air pressure is 0.4 MPaG.

* The standard actuator mounting direction is parallel to the direction of flow.

* The type with part No. ending in "F1" has an actuator shape that is different from that in the figure above.

VF Series Automatic Chemflow Butterfly Valves



Normal/reverse operation type

Unit: mm

Size (A)	Part No.		d	L	g	C	m	A	H ₁	H ₂	H ₃	m ₁	m ₂	L ₁	L ₂	Rc	Weight (kg)
	Normal operation	Reverse operation															
250	VF-5015-F1	VF-5025-F1	240	68	325	355	23	370	753	211	250	95	176	376	610	1/4	140
300	VF-6015-F1	VF-6025-F1	296	78	370	400	23	414	781	239	278	95	176	376	610	1/4	150
350	VF-7016-F1	VF-7026-F1	328	92	415	445	23	476	962	291	336	115	233	526	885	3/8	260
400	VF-8016-F1	VF-8026-F1	378	102	475	510	25	538	988	317	362	115	233	526	885	3/8	270
450	VF-9017-F1	VF-9027-F1	428	114	530	565	25	594	1156	342	402	158	301	677	1160	1/2	530

Double-acting type

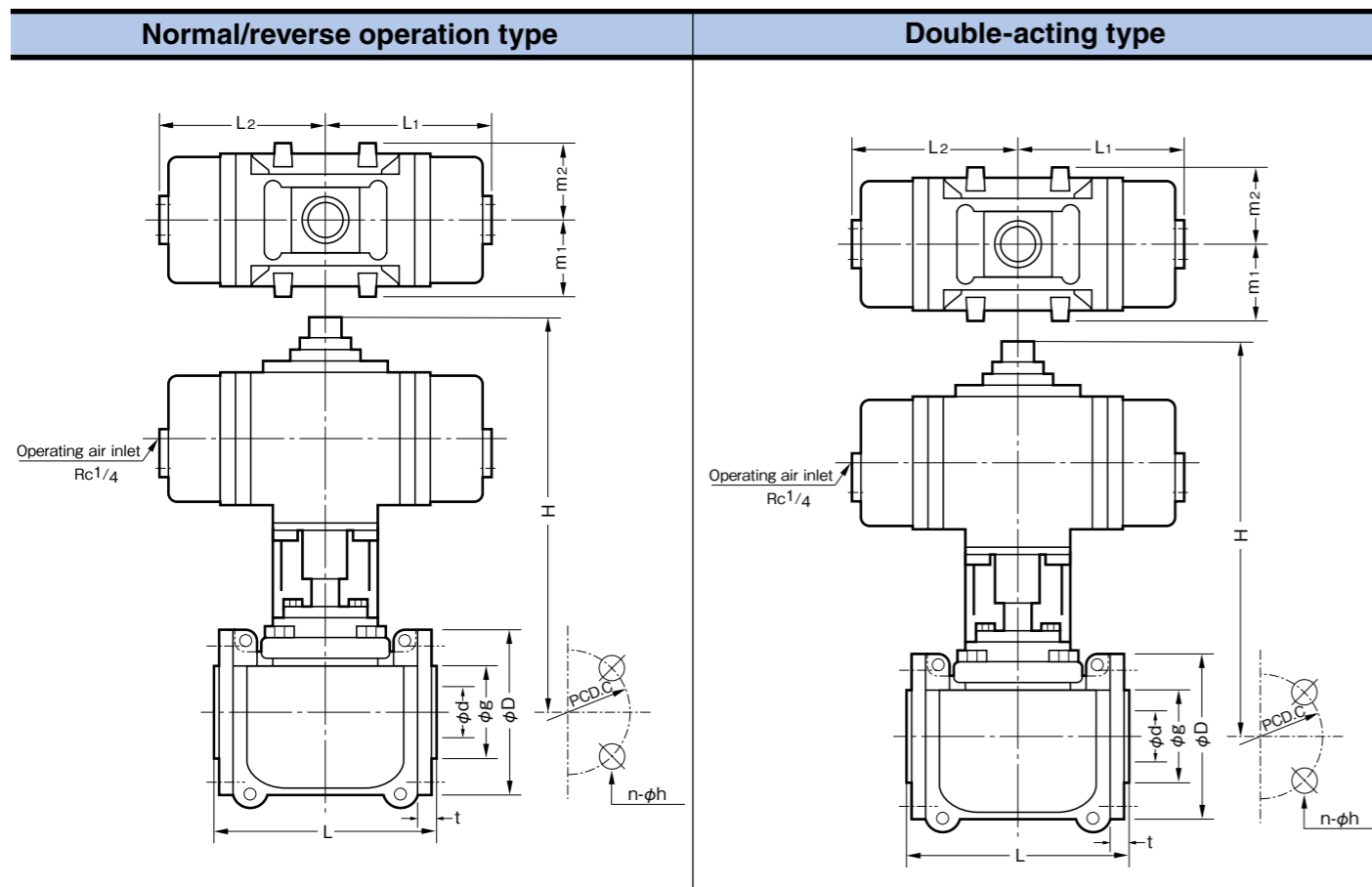
Unit: mm

Size (A)	Part No.	d	L	g	C	m	A	H ₁	H ₂	H ₃	m ₁	m ₂	L ₁	L ₂	Rc	Weight (kg)
300	VF-6034-F1	296	78	370	400	23	414	685	239	278	66	132	286	286	1/4	61
350	VF-7035-F1	328	92	415	445	23	476	887	291	336	95	176	376	376	3/8	140
400	VF-8035-F1	378	102	475	510	25	538	913	317	362	95	176	376	376	3/8	150
450	VF-9035-F1	428	114	530	565	25	594	959	342	402	95	176	376	376	1/2	180

* Standard operating air pressure is 0.4 MPaG.

* The standard actuator mounting direction is parallel to the direction of flow.

VE Series Automatic Ceramic Plug Valves



Normal/reverse operation type																Unit: mm
Size (A)	Part No.		d	L	H	m1	m2	L1	L2	D	t	g	C	n	h	Weight (kg)
	Normal operation	Reverse operation														
15	VE-0343-F9	VE-0353-F9	17	117	341	75	75	157	157	95	12	35	70	4	15	18
20	VE-0443-F9	VE-0453-F9	23	117	341	75	75	157	157	100	12	43	75	4	15	18
25	VE-0543-F9	VE-0553-F9	25	127	341	75	75	157	157	125	16	50	90	4	19	19
40	VE-0844-F9	VE-0854-F9	40	165	384	90	90	195	195	140	18	70	105	4	19	32
50	VE-1044-F9	VE-1054-F9	50	178	404	90	90	195	195	155	18	80	120	4	19	35
65	VE-1344-F9	VE-1354-F9	65	190	404	90	90	195	195	175	20	100	140	4	19	43
80	VE-1614-F1N	VE-1624-F1N	80	203	456	66	132	286	540	185	20	110	150	8	19	77
100	VE-2015-F1	VE-2025-F1	100	229	586	95	176	376	610	210	26	134	175	8	19	150
125	VE-2515-F1	VE-2525-F1	125	254	586	95	176	376	610	250	26	163	210	8	23	150
150	VE-3015-F1	VE-3025-F1	150	267	607	95	176	376	610	280	27	192	240	8	23	160

Double-acting type																Unit: mm
Size (A)	Part No.	d	L	H	m1	m2	L1	L2	D	t	g	C	n	h	Weight (kg)	
																15
20	VE-0462-F9	23	117	281	60	60	132	132	100	12	43	75	4	15	11	
25	VE-0562-F9	25	127	281	60	60	132	132	125	16	50	90	4	19	11	
40	VE-0863-F9	40	165	348	75	75	157	157	140	18	70	105	4	19	21	
50	VE-1063-F9	50	178	364	75	75	157	157	155	18	80	120	4	19	23	
65	VE-1363-F9	65	190	364	75	75	157	157	175	20	100	140	4	19	31	
80	VE-1664-F9	80	203	451	90	90	195	195	185	20	110	150	8	19	40	
100	VE-2033-F1N	100	229	429	70	156	255	147	210	26	134	175	8	19	53	
125	VE-2533-F1N	125	254	429	70	156	255	147	250	26	163	210	8	23	59	
150	VE-3034-F1N	150	267	511	66	132	413	413	280	27	192	240	8	23	90	

* Standard operating air pressure is 0.4 MPaG.
 * For 80A and larger, there are tap holes indicated by [] at 2 locations each on the top and bottom of the flange.
 * The standard actuator mounting direction is parallel to the direction of flow.
 * The type with part No. ending in "F1" has an actuator shape that is different from that in the figure above.

Automatic Valve Selection Specifications

When selecting, please provide the following information in as much detail as possible.

1. Fluid specifications

- (1) Fluid type
- (2) Fluid pressure (Max., Nor., Min.). In the case of a diaphragm valve, the cylinder size will vary depending on the fluid pressure. Be sure to provide this information.
- (3) Differential pressure when valve is open
- (4) Temperature (Max., Nor., Min.)
- (5) Flow rate
- (6) Presence of any solid substances (if present, the type, density, properties, coagulation property, etc.)

2. Requested valve type (diaphragm valve, plug valve, ball valve, butterfly valve)

3. Flange standard (JIS 10K, ANSI 150lb)

4. Automatic valve drive specifications

- (1) Operating pressure (standard 0.4 MPa)
- (2) Operation type
 - [1] Normal operation (airless open)
 - [2] Reverse operation (airless close)
 - [3] Double acting
- (3) Operating characteristics
 - [1] ON-OFF
 - [2] Control (with positioner)
- (4) Is a manual device (lever or handle) required?
- (5) Required accessory parts
 - [1] Positioner (electropneumatic or pneumatic)
 - [2] Solenoid valve (explosion-proof type or non-explosion-proof type)
 - [3] Limit switch (explosion-proof type or non-explosion-proof type)
 - Installation position
 - Open • Closed
 - [4] Air set
 - [5] Speed controller
 - [6] Other (opening controller, etc.)

5. Precautions concerning installation onto pipe

- (1) Provide support for the pipe flange so that the pipe or other load, or pipe stress caused by thermal expansion, is not applied to the valve body.
- (2) When an automatic valve is installed onto a vertical pipe, provide support for the drive device.

6. Painting specifications

- (1) NGK standard painting: Green Suboid acid-resistant paint, JPMA No. N-65
- (2) If a paint will be specified, provide its specifications.

Important notes concerning this catalog

- (1) The properties, service range, applications, dimensions, shapes, materials, and other specifications listed in this catalog are representative or standard specifications. Due to the conditions of use or other factors, the selected specifications of the actual product may differ from those listed in the catalog. For details, please contact the nearest sales office.
- (2) In order to ensure safe and correct use of the product, be sure to carefully read the instruction manual and other materials issued by NGK and correctly understand the product characteristics before performing product installation, maintenance, and inspection.
- (3) The information in this catalog may be changed without notice.



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Tokyo Sales Office	Nishi-ikebukuro TS Bldg. 10F, 3-1-15, Nishi-ikebukuro, Toshima-ku, Tokyo 171-0021	Tel. (81) 3-5391-3631	Fax. (81) 3-5391-3635
Osaka Sales Office	Midosuji Mitsui Bldg. 11F, 4-1-3, Bingomachi, Chuo-ku, Osaka 541-0051	Tel. (81) 6-6206-5810	Fax. (81) 6-6206-5809
Tokuyama Branch Office	Tokuyama Asahiseimei Bldg. 3F, 2-18, Miyukidori, Shunan-city, Yamaguchi 745-0034	Tel. (81) 834-22-9851	Fax. (81) 834-22-9853

ET Series Ceramic lined Pump

Ceramics as Impervious material
Unlike resin lined pumps, it ensures reliability due to material nature. No Swelling or Permeation which is common issue for resin lined products.

Anti-Abrasion
Stable and Durable against Crystalline substance contained media.

Broad operational range
- Head: 10-60 m
- Max. service temperature: 140°C
- Max. pressure: 0.7MPaG



Vaccum pump Ceramic lined vaccum pump unit

Unparalleled Anti-Corrosiveness
- Optimum for multi-purpose Plant
- Stable performance with corrosive media
- Cost of Maintenance considerably minimized

Non-Waste of Sealing Liquid
Thanks to ceramics strong feature, it adopts Sealing Liquid circulation system friendly to environment.

Choices to your needs
NGK offers integrated unit in ranges according to vacuum requirement



EZ Series Ceramic lined magnet drive Pump

Absolute Zero Leak
Unique NGK designed magnet driven pump with leak zero structure.

Slurry Transportation
Crystalline substance contained media conveyance available

Pressure resistant
Use of High Strength PSZ parts realized superb withstanding pressure.
Max. Operational pressure: 1.1MPaG



Glass Lining Equipment The cutting-edge N-Series GL

The "N Series" is a lineup of high-functional glass that is based on our standard glass GL400.

Non-Spark GL (NS-GL)
World's first Anti-electrostatic glass lining using Platinum fiber.

Sodium-free GL (NF-GL)
Sodium ion elution reduced to less than 1/10 of the standard glass. Ideal for processes that must avoid metal ion elution.

Neutral Color GL (NC-GL)
Improved visibility for checking cleanliness of the product surface.

NEO-GL
Improved thermal conductivity ideal for processes taking time for controlling temperature.

Multi-GL
A combination of various functions to satisfy diverse needs



Maxblend Reactor

