Eccentric Rotary Control Valve (For size 6 to 12 inches)

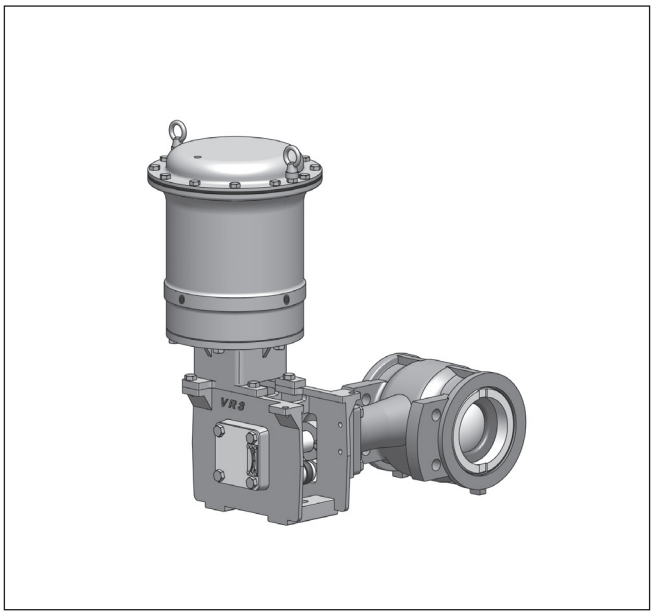
Model VFR_ _ _

OVERVIEW

The eccentric rotary control valve, Model VFR consists of a straight-through valve body with minimal flow resistance and an open yoke plug with a wing that rotates eccentrically. The FloWing is suitable for applications requiring a large flow capacity and wide rangeability, and for the control of those slurry fluids susceptible to clogging.

Also, the model VFR is able to control the occurrence of cavitation when the liquid is decompressed with high pressure reduction and can decrease the level of noise and vibration. The model VFR can effectively decompress the liquid by inserting a perforated plate (Multi-hole plate) into the main body outlet side of the valve. Therefore, cold and warm water with a low or medium pressure line or process liquid can be controlled even with a Kc value* over 0.55. Furthermore, for the multi-hole plate, there are two types: the built-in type and the combined external type (model HRL).

Note) Please refer to selection guide.



SPECIFICATIONS

Body

Type

Straight-through

Valve size

6, 8, 10, or 12 inches

If you need nominal size 4 inches or below, please refer to No.SS2-VFR100-0200.

Pressure rating and End connection

Pressure rating	Nominal size (inches)			
	6	8	10	12
JIS 10K, 20K ANSI 150, 300 JPI 150, 300	○△	○△	○△	○△

Note) ○ : wafer type, △: flange type

• Wafer type

For bolt and nut materials and fluid temperatures, refer to Table 1. (The connection bolts and nuts are provided as standard accessories.)

Table 1. Piping bolt and nut materials and applicable fluid temperature ranges

Fluid temperature	Material of bolts	Material of nuts
-25 to +350°C	SNB7	S45C
-60 to -30°C	SUS304	SUS304

• Flange type

Connection type	Pressure rating	Applicable standard
RF	JIS10K	JIS B2212-1972
	JIS20K	JIS B2214-1967
	ANSI Class 150, 300	ANSI B16.5-1968
	JPI Class 150, 300	JPI-7S-15-1993

Material

For combinations of valve body, trim materials and fluid temperatures, refer to Table 1.

Bonnet

Integral body type (-60 to +350°C)

Gland type

Bolted gland

Grease

• Without grease…...PTFE yarn

• With grease……Graphite packings

Note) PTFE: Polytetrafluoroethylene.

Trim

Valve plug

Eccentric rotary open yoke plug with wing

Seat ring

Clamp seat ring

Material

For combinations of valve body, trim materials and fluid temperatures, refer to Table 2.

Actuator

Type

Spring type pneumatic diaphragm actuator

Action

Direct or reverse action

Diaphragm

Chloroprene rubber reinforced with nylon fabric

Spring range

Actuator model	Spring range
VR3D (R)	80 to 160 kPa {0.8 to 1.6 kgf/cm^2} 180 to 270 kPa {1.8 to 2.8 kgf/cm^2}
VR3HD (R)	90 to 160 kPa {0.9 to 1.6 kgf/cm^2} 190 to 270 kPa {1.9 to 2.8 kgf/cm^2}

Note) Spring range and air supply pressure vary according to nominal size.

Supply pressure

340 to 490 kPa {3.5 to 5.0 kgf/cm^2},

Air connection

Rc1/4 or NPT1/4 internal thread

Ambient temperature

-30 to +70°C

Maximum diaphragm chamber capacity

- VR3D (R) : 5800 cm^3
- VR3HD (R) : 5200 cm^3

Valve action

Direct or reverse action

Positioner

Input/Output Signal	Type	Model
I/P	Smart type electronic	AVP7_ _ AVP3_ _ AVP2_ _
P/P	Pnematic	VPR_ _

Optional accessories (provided upon request)

Pressure regulator with filter, handwheel, limit switch, solenoid valve, motion transmitter, booster relay, lock-up valve, and others.

Note) 1. For the optional items, refer to the specification sheets and installation drawings of respective accessories.

Additional specifications (special order)

- Multi-hole plate (built-in type)
- Special inspections

  Flow characteristic inspection, material inspection (Material certificate), non-destructive inspection, steam inspection, low temperature inspection
- Flange type
- Copper free treatment
- Oil/water free treatment
- SUS304 atmosphere-exposed nuts and bolts
- Sand-/dust-preventive measures
- Special air connections and joint
- Cold-area use specifications
- Saline damage countermeasures
- Tropical-area use specifications
- Vacuum service
- Yoke material (SCPH12)*
- Compliance to the High Pressure Gas Control Law

*Note) *: Carbon steel (A216 WCB) is the standard material for yoke used in actuator model RSA.*

Performance

Rated Cv value

Refer to "Cv value and travels" on page 4.

Flow characteristics

Refer to Figure 2.

Inherent rangeability

100 : 1

Allowable differential pressure

Refer to Table 6 and Table 7.

Leakage specifications

IEC 60534-4:2006 or JIS B 2005-4:2008

- Metal seat

  IEC-60534-4-1999 or JIS B 2007-1993
  Class IV : Leakage less than 0.01% of maximum valve capacity.

  Leakage less than 0.001% (optional)
- Soft seat

  Class VI : Leakage less than 0.00001% of maximum valve capacity.

Hysteresis error

±1%F.S. with modelAVP_ _ _ positioner

Linearity

±1%F.S. with modelAVP_ _ _ positioner

Reference Operation speed

• VR3D (R) : 21 sec.

(With air supply pressure 340 kPa {3.5 kgf/cm²} for VR3 using model VPR positioner and pressure regulator with filter, and with no load.)

Note) From fully closed to fully open

Dimensions

Refer to Figure 4 and Table 12.

Weight

Refer to Table 12

Mounting position

Refer to Figure 5.

Finish

Blue (Munsell 10B5/10) or silver, or other specified colors.

Table 2. Body / trim material combination and operating temperature ranges (°C)

Components		Material									
Valve body	JIS	SCPH2				SCS13A			SCS14A		
	ASTM	A216WCB				A351 CF8			A351 CF8M		
Trims	Valve plug	SCS24		SCS14 CoCr-A		SCS14 CoCr-A			SCS14 CoCr-A		
	Seat ring	SUS630	SUS316 PTFE seat *4	SUS316	SUS316 PTFE seat *4	SUS316	SUS316 CoCr-A	SUS316 PTFE seat *4	SUS316	SUS316 CoCr-A	SUS316 PTFE seat *4
	Seat retainer	SUS630	SUS316								
	Brain bearing	SUS440C *1 *2				SUS316 CoCr-A					
	Main bushing	SUS440C *1*2				SUS316 CoCr-A					
	Valve stem	SUS316 *2									
	Key	SUS630				CoCr-A					
	Spring	SUS316									
	Packing ring	SUS316									
	Packing	PTFE yarn, Graphite packing + carbon yarn packing *3, Low emission packing*6									
	Packing follower	SUS316									
	Packing flange	SUS304									
	Bolts and nuts for packing flange	SCM3 / SUS304 (For packing)									
	Gasket	Spiral type *5 (Installed between seat ring and seat retainer)									
Temperature range		-5 to +350°C				-60 to +350°C					

*Note) *1. SUS316 CoCr-A type is used for valves for gas or steam service.*

**2. SUS316 CoCr-A type is used for valves for thermal medium service.*

**3. P6610CH (graphite packing) + P6528 (carbon yarn packing) is used for valves for thermal medium service.*

**4. SUS316 PTFE seat (glass reinforced) type is applicable to fluid temperatures -30 to +200°C (standard type) or -60 to -31°C (low temperature type).*

**5.*

	Temperature range	Gasket material
General	-60°C ≤ t ≤ +350°C	SUS316 with inorganic paper as filler material
Oil free	-60°C ≤ t < +230°C	SUS316 with PTFE as filler material
	+230°C ≤ t ≤ +350°C	SUS316 with graphite as filler material

**6. Regarding low emission gland packing detail is shown in SS2-SSL100-0100*

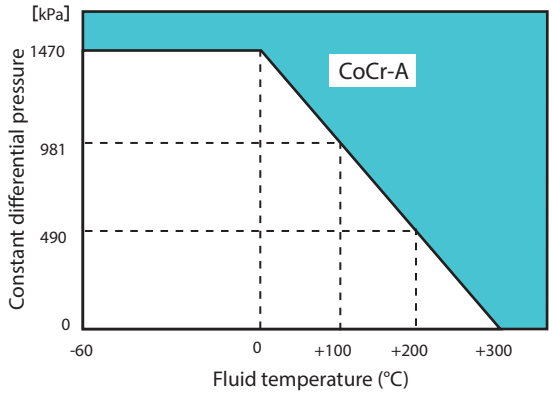


Figure 1. Temperature / normal differential pressure ranges requiring CoCr-A

Cv value and travels

Table 3. Cv value and travels (Standard model)

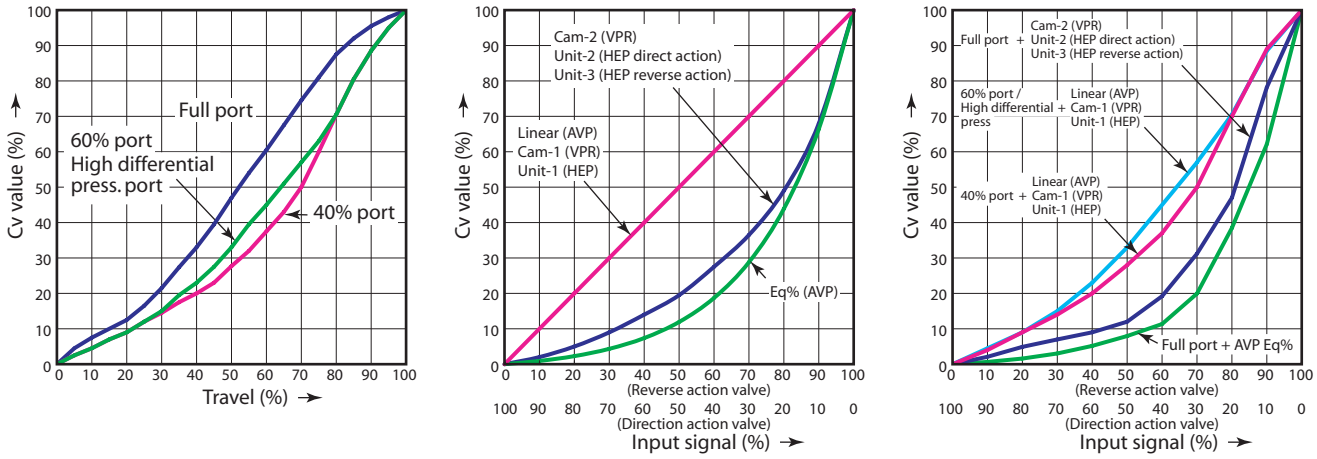
Nominal size (inch)		6	8	10	12
VR3	Full port	600	1000	1400	1900
	60% port	360	600	840	1140
	40% port	240	400	560	760
	Rated travel (Rotating angle)	100 (60°)			
VR3H (high differential press)	60% port	300	510	700	950
	40% port	210	360	520	700
	Rated travel (Rotating angle)	90 (54°)			

Table 4. Cv value and travels (Multi-hole plate model for anti-cavitation and noise reduction)

Multi-hole plate type		built-in type	assembled with model HRL		
Nominal size (inch)		6	8	10	12
VR3	Full port	420	700	1080	1510
	60% port	255	420	600	830
	40% port	170	280	400	550
	Rated travel (Rotating angle)	100 (60°)			
VR3H (high differential press)	60% port	230	390	540	750
	40% port	155	270	380	530
	Rated travel (Rotating angle)	90 (54°)			

Table 5. Cv values and travels (Multi-hole plate model HRL single Cv value) (Formed between the flanges)

Nominal size (inch)		6	8	10	12
Rated Cv value	Full port	590	980	1700	2480
	60% port	360	590	860	1210
	40% port	230	400	570	800



a. Flow characteristics of valve **b. Positioner cam/unit characteristics** **c. Modified flow characteristics**
(Combination of 4 and 6 characteristics)

Figure 2. Flow characteristics when valve is used in conjunction with positioner cam/unit

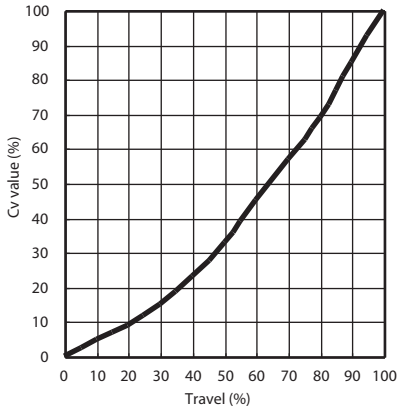


Figure 3. Flow characteristic for 60% port or high differential pressure port

Allowable differential pressures

Metal seat and PTFE packing combination

Table 6. Air-to-Close

Actuator model	Air supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure [Upper : by nominal size (inch), Lower : port capacity] kPa{kgf/cm²}											
			6			8			10			12		
			Full	60%	40%	Full	60%	40%	Full	60%	40%	Full	60%	40%
VR3D	340 {3.5}	80 to 160 {0.8 to 1.6}	2060 {21.0}	2060 {21.0}	2060 {21.0}	981 {10.0}	981 {10.0}	981 {10.0}	—	—	—	—	—	—
	490 {5.0}	80 to 160 {0.8 to 1.6}	—	—	—	—	—	—	981 {10.0}	981 {10.0}	981 {10.0}	780 {8.0}	780 {8.0}	780 {8.0}
VR3HD (high differential press)	340 {3.5}	90 to 160 {0.9 to 1.6}	—	4100 {41.8}	5100 {52.0}	—	1900 {19.3}	2700 {27.5}	—	—	—	—	—	—
	490 {5.0}	90 to 160 {0.9 to 1.6}	—	—	—	—	—	—	—	2000 {20.4}	2900 {29.5}	—	1200 {12.2}	1900 {19.4}

Metal seat and PTFE packing combination

Table 7. Air-to-Close

Actuator model	Air supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure [Upper : by nominal size (inch), Lower : port capacity] kPa{kgf/cm²}											
			6			8			10			12		
			Full	60%	40%	Full	60%	40%	Full	60%	40%	Full	60%	40%
VR3R	340 {3.5}	80 to 160 {0.8 to 1.6}	1180 {12.0}	1180 {12.0}	1180 {12.0}	—	—	—	—	—	—	—	—	—
		180 to 270 {1.8 to 2.8}	2060 {21.0}	2060 {21.0}	2060 {21.0}	981 {10.0}	981 {10.0}	981 {10.0}	490 {5.0}	490 {5.0}	490 {5.0}	340 {3.5}	340 {3.5}	340 {3.5}
VR3HR (high differential press)	340 {3.5}	90 to 160 {0.9 to 1.6}	—	2000 {20.4}	2700 {27.5}	—	—	—	—	—	—	—	—	—
		190 to 270 {1.9 to 2.8}	—	4300 {43.8}	5100 {52.0}	—	2000 {20.4}	2900 {29.5}	—	1100 {11.2}	1600 {16.3}	—	690 {7.0}	1000 {10.2}

Metal seat and Graphite packing "P6610CH+P6528 :+230 to +350 °C"

Table 8. Air-to-Close

Actuator model	Air supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure [Upper : by nominal size (inch), Lower : port capacity] kPa{kgf/cm²}											
			6			8			10			12		
			Full	60%	40%	Full	60%	40%	Full	60%	40%	Full	60%	40%
VR3D	340 {3.5}	80 to 160 {0.8 to 1.6}	2060 {21.0}	2060 {21.0}	2060 {21.0}	980 {10.0}	980 {10.0}	980 {10.0}	——	——	——	——	——	——
	490 {5.0}	80 to 160 {0.8 to 1.6}	——	——	——	——	——	——	980 {10.0}	980 {10.0}	980 {10.0}	640 {6.5}	640 {6.5}	640 {6.5}
VR3HD (high differential press)	340 {3.5}	90 to 160 {0.9 to 1.6}	——	3300 {33.6}	4600 {46.9}	——	1600 {16.3}	2200 {22.4}	——	——	——	——	——	——
	490 {5.0}	90 to 160 {0.9 to 1.6}	——	——	——	——	——	——	——	1700 {17.3}	2500 {25.5}	——	1000 {10.2}	1600 {16.3}

Table 9. Air-to-Open

Actuator model	Air supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure [Upper : by nominal size (inch), Lower : port capacity] kPa{kgf/cm²}											
			6			8			10			12		
			Full	60%	40%	Full	60%	40%	Full	60%	40%	Full	60%	40%
VR3R	340 {3.5}	80 to 160 {0.8 to 1.6}	630 {6.4}	630 {6.4}	630 {6.4}	——	——	——	——	——	——	——	——	——
		180 to 270 {1.8 to 2.8}	2040 {20.8}	2040 {20.8}	2040 {20.8}	970 {9.9}	970 {9.9}	970 {9.9}	480 {4.9}	480 {4.9}	480 {4.9}	290 {3.0}	290 {3.0}	290 {3.0}
VR3HR (high differential press)	340 {3.5}	90 to 160 {0.9 to 1.6}	——	1200 {12.2}	1700 {17.3}	——	——	——	——	——	——	——	——	——
		190 to 270 {1.9 to 2.8}	——	3500 {35.7}	4800 {48.9}	——	1700 {17.3}	2400 {24.5}	——	870 {8.9}	1200 {12.2}	——	520 {5.3}	830 {8.4}

Soft seat and PTFE packing combination

Table 10. Air-to-Close

Actuator model	Air supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure [Upper : by nominal size (inch), Lower : port capacity] kPa{kgf/cm²}											
			6			8			10			12		
			Full	60%	40%	Full	60%	40%	Full	60%	40%	Full	60%	40%
VR3D	340 {3.5}	80 to 160 {0.8 to 1.6}	2060 {21.0}	2060 {21.0}	2060 {21.0}	981 {10.0}	981 {10.0}	981 {10.0}	——	——	——	——	——	——
	490 {5.0}	80 to 160 {0.8 to 1.6}	——	——	——	——	——	——	981 {10.0}	981 {10.0}	981 {10.0}	780 {8.0}	780 {8.0}	780 {8.0}

Soft seat and PTFE packing combination

Table 11. Air-to-Open

Actuator model	Air supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure [Upper : by nominal size (inch), Lower : port capacity] kPa{kgf/cm²}											
			6			8			10			12		
			Full	60%	40%	Full	60%	40%	Full	60%	40%	Full	60%	40%
VR3R	340 {3.5}	80 to 160 {0.8 to 1.6}	1180 {12.0}	1180 {12.0}	1180 {12.0}	——	——	——	——	——	——	——	——	——
		180 to 270 {1.8 to 2.8}	2060 {21.0}	2060 {21.0}	2060 {21.0}	981 {10.0}	981 {10.0}	981 {10.0}	490 {5.0}	490 {5.0}	490 {5.0}	340 {3.5}	340 {3.5}	340 {3.5}

DIMENSIONS

Table 12. Dimension and weight in wafer connection [Unit: mm]

Nominal size (Inch)	Pressure rating	Actuator model	K	A	B	C	D	E	F	R	P	H	G	M	N	Weight (kg)
6	JIS10K	VR3D (R) VR3HD (R)	229	420	150	164	214	22.5	23	120	315	740 (660)	195	320	93	100
	JIS20K							15	25	130						
	ANSI150							22.5	22	120.75						
	ANSI300							15	22	135						
	JPI150							22.5	22	120.65						
	JPI300							15	22	134.85						
8	JIS10K	VR3D (R) VR3HD (R)	243	449	180	207	264	15	23	145	315	740 (660)	195	320	93	125
	JIS20K							15	25	152.5						
	ANSI150							22.5	22	149.25						
	ANSI300							15	25	165						
	JPI150							22.5	22	149.2						
	JPI300							15	26	165.1						
10	JIS10K	VR3D (R) VR3HD (R)	297	510	220	246	324	15	25	177.5	315	740 (660)	195	320	93	165
	JIS20K							15	27	190						
	ANSI150							15	25	181						
	ANSI300							11.25	29	193.75						
	JPI150							15	26	181.0						
	JPI300							11.25	29	193.7						
12	JIS10K	VR3D (R) VR3HD (R)	338	530	260	296	369	11.25	25	200	315	740 (660)	195	320	93	185
	JIS20K							11.25	27	215						
	ANSI150							15	25	216						
	ANSI300							11.25	32	225.5						
	JPI150							15	26	215.9						
	JPI300							11.25	32	225.4						

Nominal size (Inch)	Mounting position of valve on process pipes (SV0512-XXX)	L
6	100, 101, 500, 501, 010, 010, 020, 021	610 (530)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	640 (560)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)
8	100, 101, 500, 501, 010, 010, 020, 021	605 (525)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	645 (565)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)
10	100, 101, 500, 501, 010, 010, 020, 021	600 (520)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	650 (570)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)
12	100, 101, 500, 501, 010, 010, 020, 021	595 (515)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	655 (575)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)

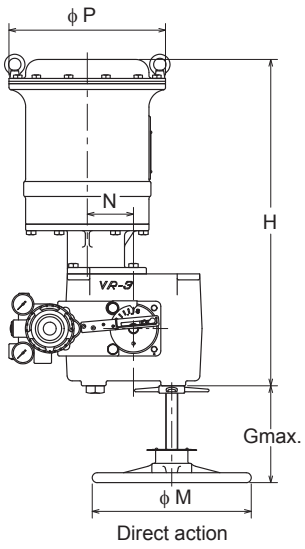
*Note) *1. The face-to-face dimensions comply with IEC 60534-3-2 and JIS B2005-3-2.*

**2. The H dimensions enclosed in the parentheses are for the spring range 80 to 160 kPa {0.8 to 1.6 kgf/cm²}.*

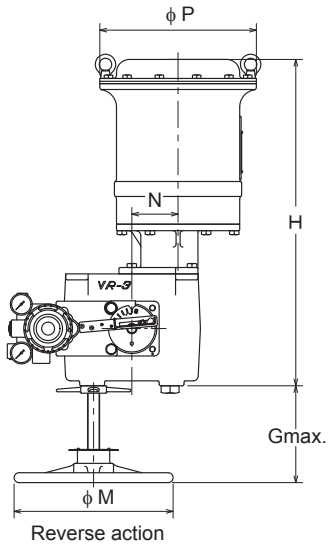
**3. Face-to-face dimensions of the anti-cavitation specification (built-in type) will not be changed.*

**4. Please use joint sheet gasket for piping connection.*
In case of using spiral wound gasket, please prepare the gasket conforming to inner and outer diameters of gasket contact surface because the gasket of non-standard dimensions is needed in following conditions.

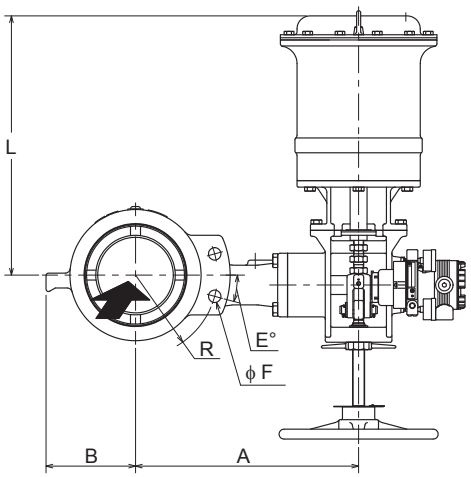
- For nominal size 6”/8”/10”/12” and JIS20K
- For nominal size 6”/8”/12” and ANSI150/300



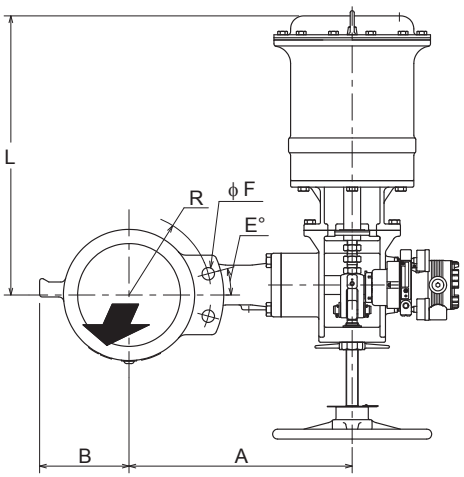
Direct action



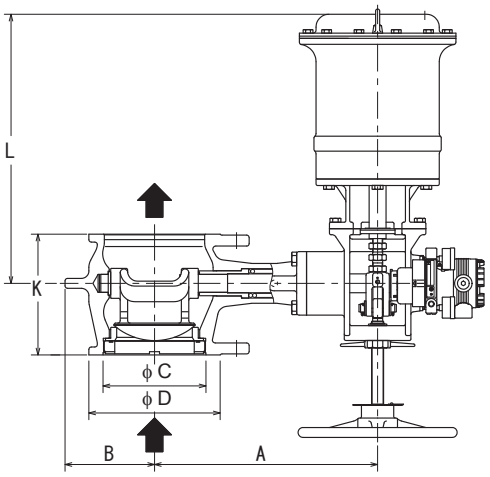
Reverse action



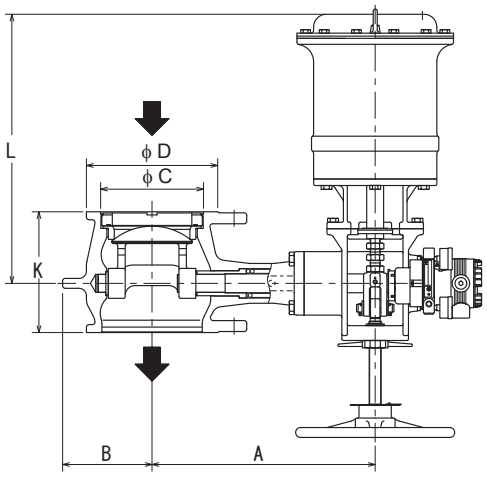
Mounting position：SV512 -
100, 101, 500, 501, 010, 011, 020, 021



Mounting position：SV512 -
300, 301, 700, 701, 050, 051, 060, 061



Mounting position：SV512 -
200, 201, 600, 601, 030, 031, 040, 041



Mounting position：SV512 -
400, 401, 800, 801, 070, 071, 080, 081

Please refer to figure 7 to 12 for detail of mounting position.

Figure 4. Face-to-face and external dimensions in wafer connection

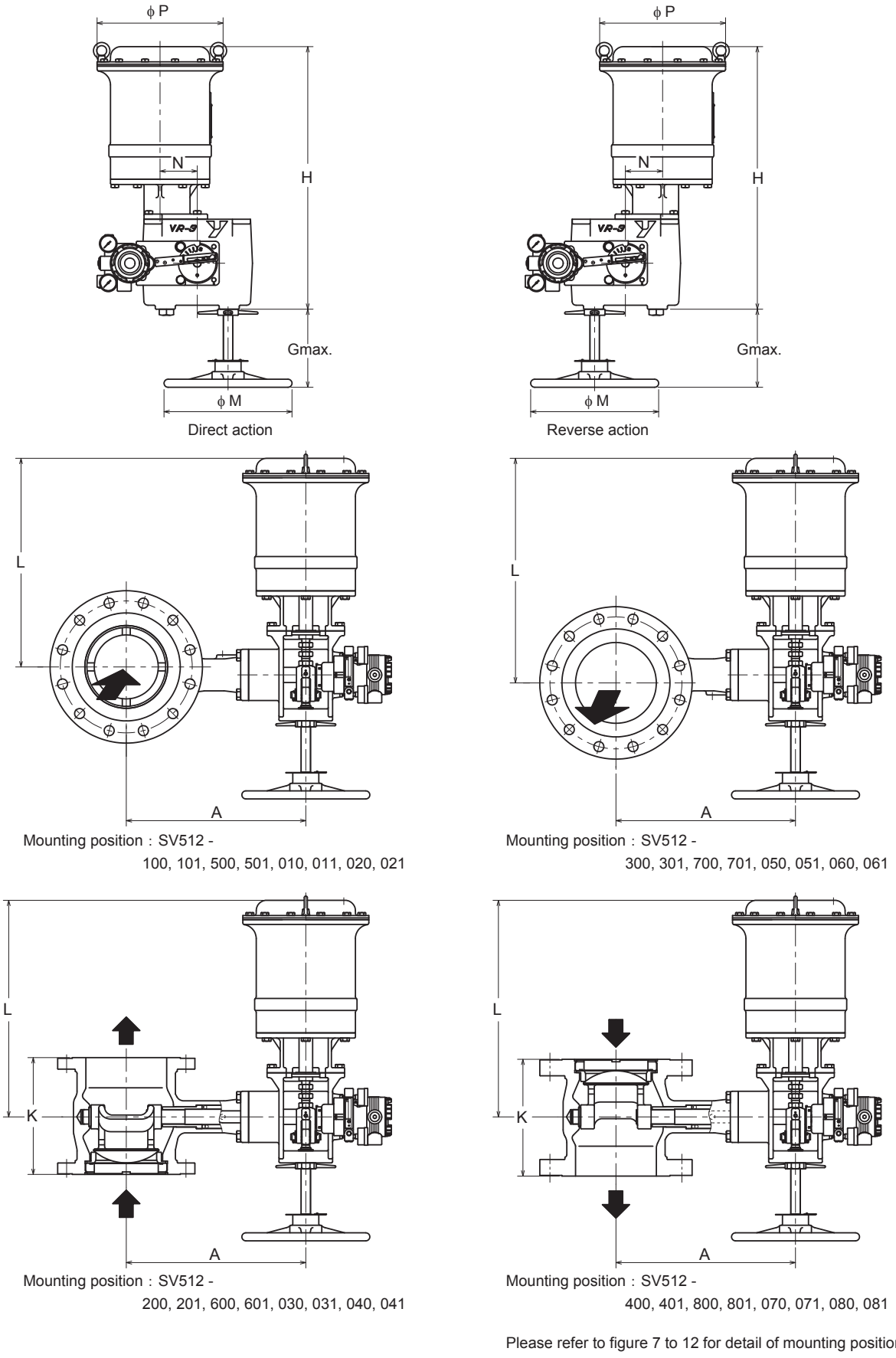
Table 13. Dimensions and weight in flange connection [Unit: mm]

Nominal size (Inch)	Pressure rating	Actuator model	K	A	P	H	G	M	N	Weight (kg)
6	JIS10K, ANSI150, JPI150	VR3D (R) VR3HD (R)	267	420	315	740 (660)	195	320	93	116
	JIS20K, ANSI300, JPI300									133
8	JIS10K, ANSI150, JPI150	VR3D (R) VR3HD (R)	292	449	315	740 (660)	195	320	93	150
	JIS20K									150
	ANSI300, JPI300									180
10	JIS10K, ANSI150, JPI150	VR3D (R) VR3HD (R)	330	510	315	740 (660)	195	320	93	200
	JIS20K									215
	ANSI300, JPI300									235
12	JIS10K, ANSI150, JPI150	VR3D (R) VR3HD (R)	356	530	315	740 (660)	195	320	93	245
	JIS20K									245
	ANSI300, JPI300									320

Nominal size (Inch)	Mounting position of valve on process pipes (SV0512-XXX)	L
6	100, 101, 500, 501, 010, 011, 020, 021	610 (530)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	640 (560)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)
8	100, 101, 500, 501, 010, 011, 020, 021	605 (525)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	645 (565)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)
10	100, 101, 500, 501, 010, 011, 020, 021	600 (520)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	650 (570)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)
12	100, 101, 500, 501, 010, 011, 020, 021	595 (515)
	200, 201, 600, 601, 030, 031, 040, 041	625 (545)
	300, 301, 700, 701, 050, 051, 060, 061	655 (575)
	400, 401, 800, 801, 070, 071, 080, 081	625 (545)

*Note) *1. The H dimensions enclosed in the parentheses are for the spring range 80 to 160 kPa {0.8 to 1.6 kgf/cm²}.*

**2. Face-to-face dimensions of the anti-cavitation specification (built-in type) will not be changed.*



Please refer to figure 7 to 12 for detail of mounting position.

Figure 5. Face-to-face and external dimensions in flange connection

Selection guide for the multi-hole plate (anti-cavitation and low noise specification)

1. selection standard

- **For incompressible fluid (liquid)**

Cavitation number (Kc value) will be calculated according to the operation condition.
The multi-hole plate is recommended (select the specification) if the calculated Kc value is over 0.55. It is not applicable for compressible fluid (gas/steam).

$$Kc = \frac{\Delta P}{P_1 - P_v}$$

P_1: Valve primary side pressure
P_2: Valve secondary side pressure
Pv: Saturated vapor pressure of fluid according to inflow side temp. condition

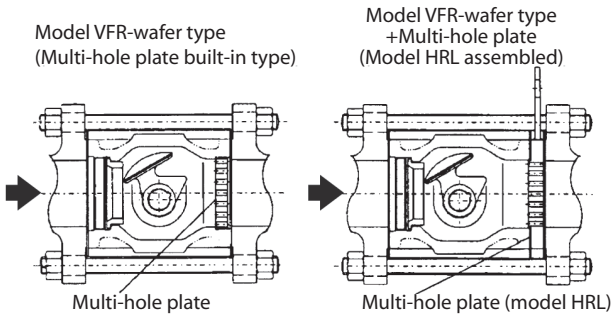
$\triangle P = P_1 - P_2$: Valve differential pressure

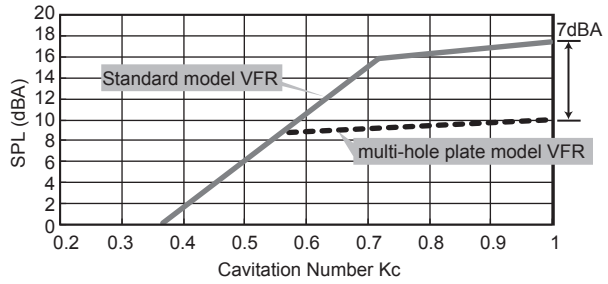
- **For compressible fluid (gas/steam)**

Calculate predictive noise level.
The multi-hole plate is recommended if predict noise level is higher than the regulation level.

2. Noise control efficiency of the multi-hole plate

The figure below shows differences in the noise occurring based on the structures of the standard type and multi-hole plate type model VFR. Noise that occurs when controlling the flow differs depending on the structures of the valve body and inner valve. The multi-hole plate type model has a maximum noise suppression of 7 dBA.





Noise control efficiency (dBA)

Table 14. Anti-cavitation plate model HRL: External dimensions and weight [Unit: mm]

Nominal size (inch)	Pressure rating	ϕD	ϕd	T1	T2	H	W	T3	ϕF	Weight (kg)	Face-to-face dimensions *1
6	JIS 10K	212	149	15	6	114	40	8	20	4.8	247.2
	JIS 20K	230								5.4	
	ANSI 150, 300	216								4.7	
8	JIS 10K	262	199	20	10	114	40	8	20	7.2	266.2
	JIS 20K	275								7.4	
	ANSI 150, 300	270								6.8	
10	JIS 10K	324	246	20	10	114	40	8	20	14.9	320.2
	JIS 20K	345								11.2	
	ANSI 150, 300	324								14.9	
12	JIS 10K	368	296	20	10	114	40	8	20	19.5	361.2
	JIS 20K	395								22.1	
	ANSI 150, 300	381								20.7	

*Note) *1. Face-to-face dimensions include the valve main body model VFR and gasket. (3.2 mm)*

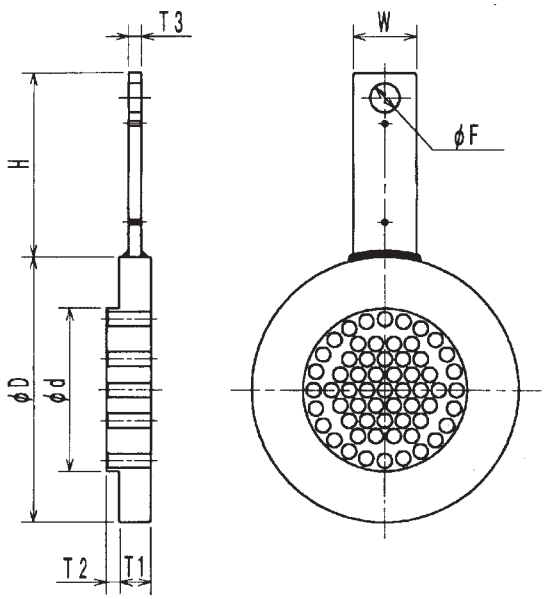


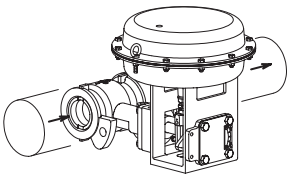
Figure 6. Model HRL external drawing

Code number structure (Example)

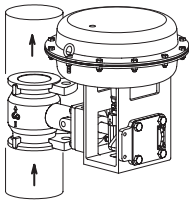
No. 1 0 0

- 1: Mounting angle on a pipe (See figures below)
- 0: Water-proof (0 : No, 1 : Yes)
- 0

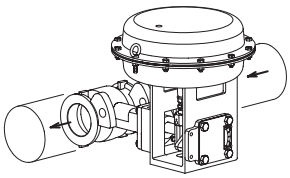
No. 100 (Standard)
No. 101



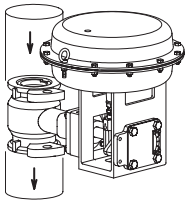
No. 200
No. 201



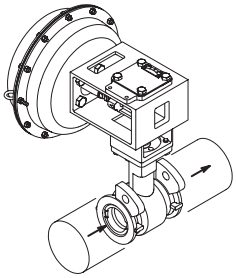
No. 300
No. 301



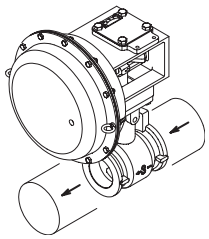
No. 400
No. 401



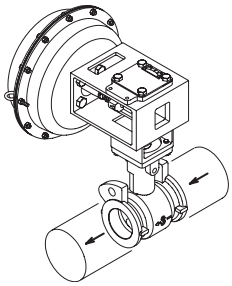
No. 500
No. 501



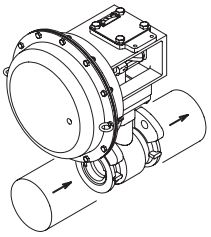
No. 600
No. 601



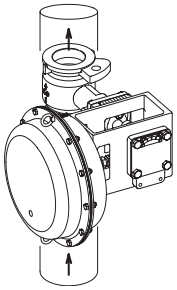
No. 700
No. 701



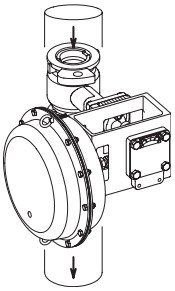
No. 800
No. 801



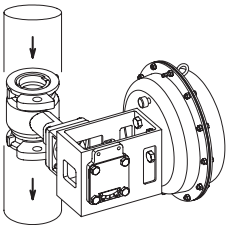
No. 010
No. 011



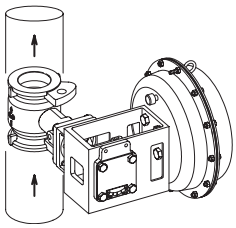
No. 060
No. 061



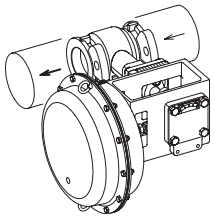
No. 020
No. 021



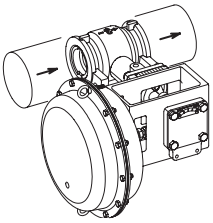
No. 050
No. 051



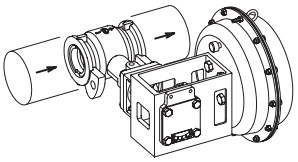
No. 040
No. 041



No. 070
No. 071



No. 030
No. 031



No. 080
No. 081

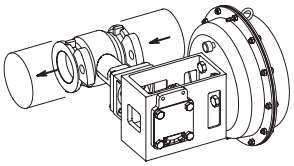


Figure 7. Mounting position of valve on process pipes (Applicable to non-positioner case)

Note) 1. The pressure regulator with filter is mounted vertically to the ground.

2. Specify mounting positions other than the above standard mounting positions with code number.

3. When installing indoor, water-proof construction is not needed.

4. When the first 2 digits of the model number, which indicate the mounting angle type, are 50, 60, 70, 80, 01, 02, 03, 04, 05, 06, 07 or 08,water-proof construction is needed if installing outdoor.

5. When the first 2 digits of the model number, which indicate the mounting angle type, are 10, 20, 30 or 40, water-proof construction is not required whether it is outdoor or not.

6. When the first 2 digits of the model number, which indicate the mounting angle type, are 10, 20, 30 or 40, either integral mounting of pressure regulator with filter or separate mounting from positioner can be selected.

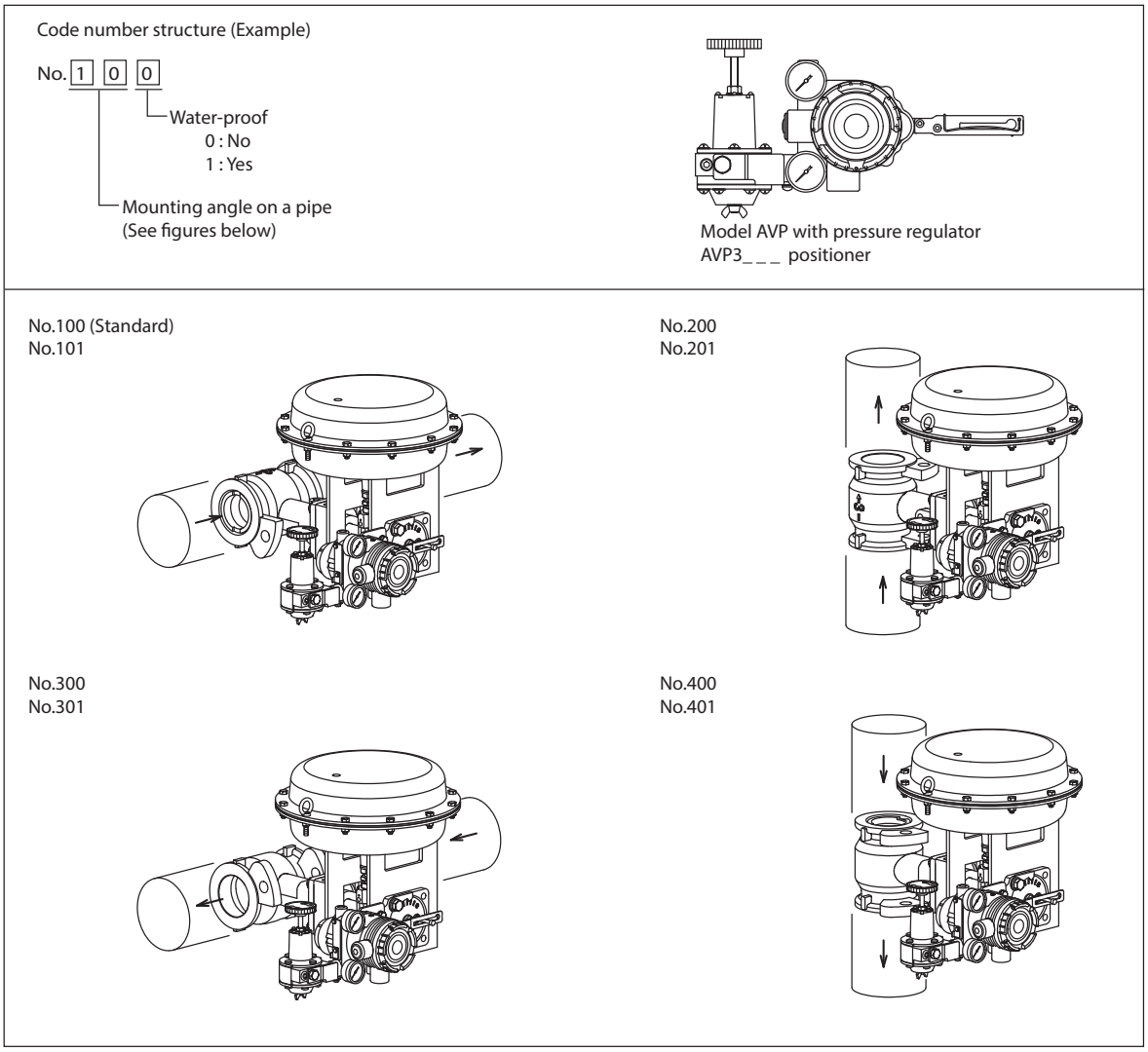


Figure 8. Mounting position of valve on process pipes (Applicable to model AVP7 _ _ / AVP3_ _ _ positioner with pressure regulator)

Note) 1. The pressure regulator with filter is mounted vertically to the ground.

2. Specify mounting positions other than the above standard mounting positions with code number.

3. When installing indoor, water-proof construction is not needed.

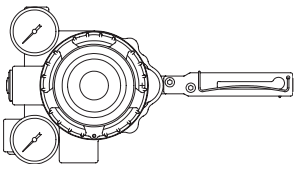
4. When the first 2 digits of the model number, which indicate the mounting angle type, are 10, 20, 30 or 40, water-proof construction is not required whether it is outdoor or not.

5. Figure 8 shows the installation of model AVP3_ _ _. Model AVP7_ _ _ also can be installed in the same way.

Code number structure (Example)

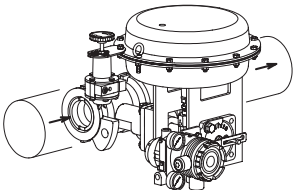
No. 1 0 0

- Water-proof
  - 0 : No
  - 1 : Yes
- Mounting angle on a pipe (See figures below)

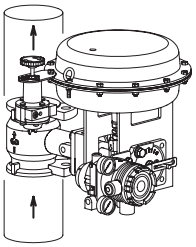


AVP_ _ _ positioner

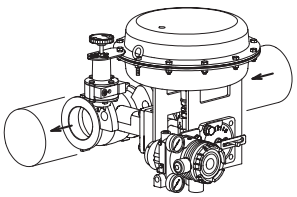
No. 100 (Standard)
No. 101



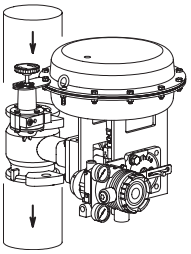
No. 200
No. 201



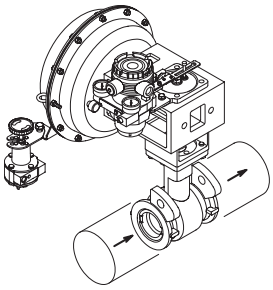
No. 300
No. 301



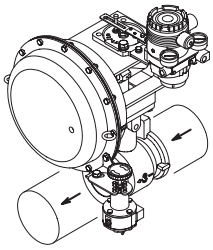
No. 400
No. 401



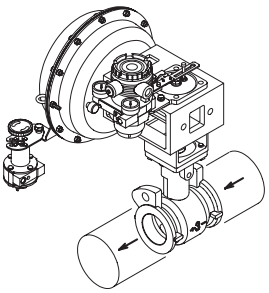
No. 500
No. 501



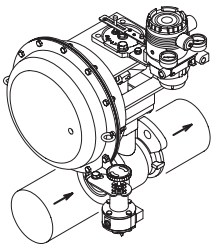
No. 600
No. 601



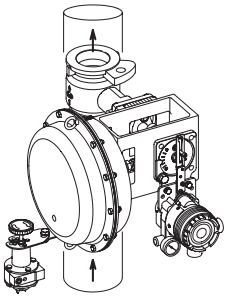
No. 700
No. 701



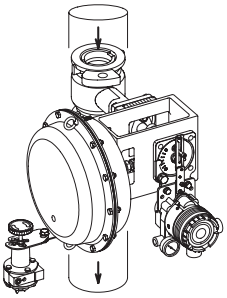
No. 800
No. 801



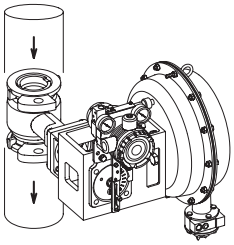
No. 010
No. 011



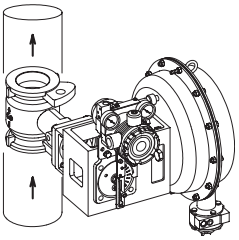
No. 060
No. 061



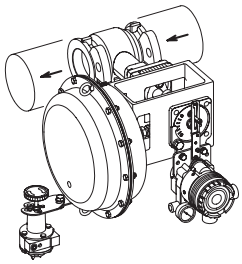
No. 020
No. 021



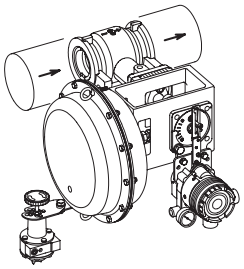
No. 050
No. 051



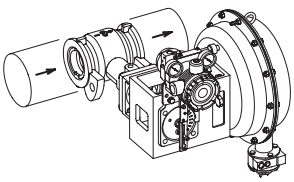
No. 040
No. 041



No. 070
No. 071



No. 030
No. 031



No. 080
No. 081

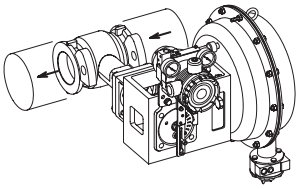


Figure 9. Mounting position of valve on process pipes (Applicable to model AVP7_ _ _/AVP3_ _ _ positioner)

Note) 1. The pressure regulator with filter is mounted vertically to the ground.

2. Specify mounting positions other than the above standard mounting positions with code number.

3. When installing indoor, water-proof construction is not needed.

4. When the first 2 digits of the model number, which indicate the mounting angle type, are 50, 60, 70, 80, 01, 02, 03, 04, 05, 06, 07 or 08, water-proof construction is needed if installing outdoor.

5. When the first 2 digits of the model number, which indicate the mounting angle type, are 10, 20, 30 or 40, water-proof construction is not required whether it is outdoor or not.

6. Figure 9 shows the installation of model AVP3_ _ _. Model AVP7_ _ _ also can be installed in the same way.

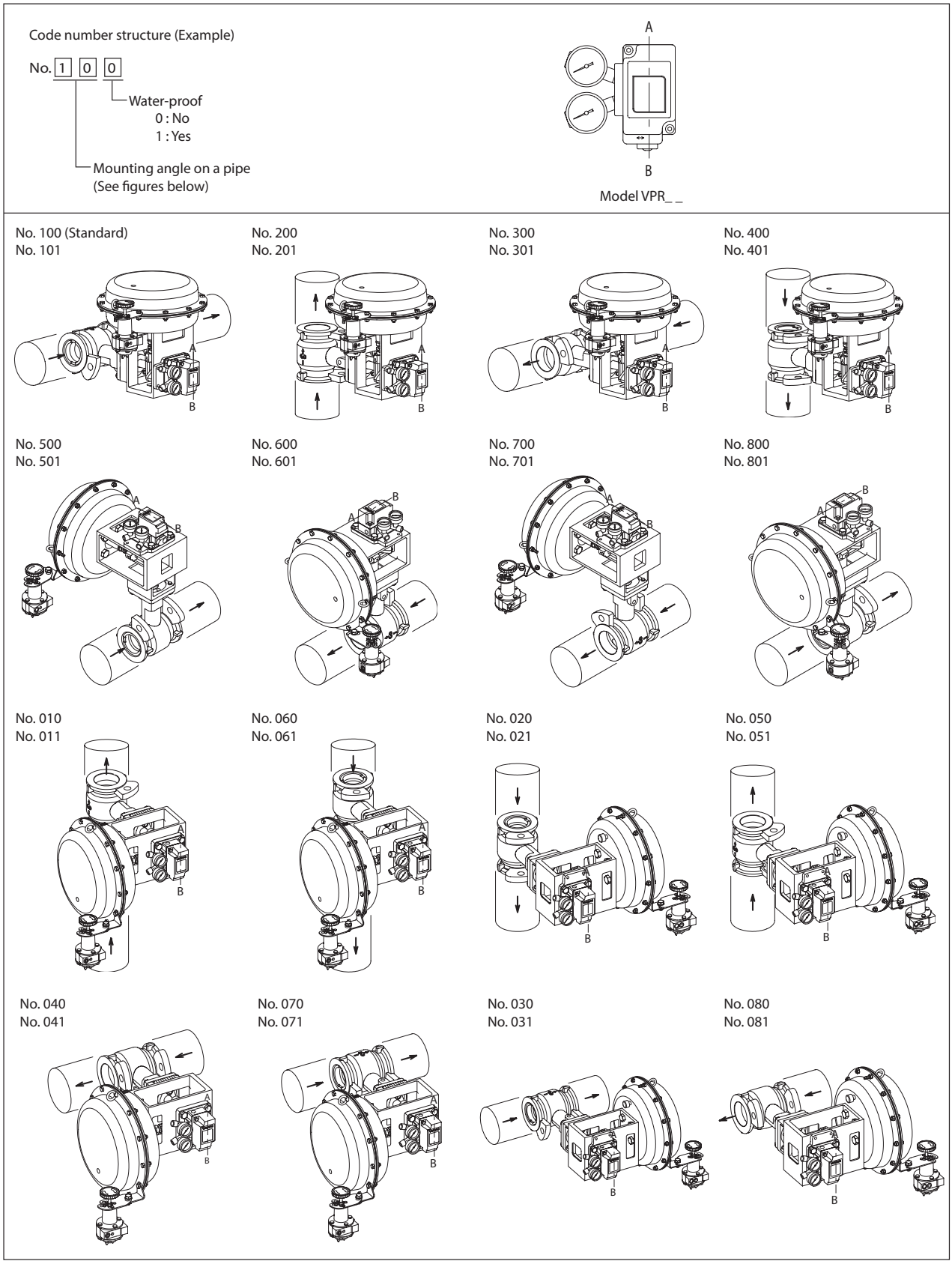


Figure 10. Mounting position of valve on process pipes (Applicable to model VPR_ _ positioner)

Note) 1. The pressure regulator with filter is mounted vertically to the ground.

2. Specify mounting positions other than the above standard mounting positions with code number.

3. When installing indoor, water-proof construction is not needed.

4. When the first 2 digits of the model number, which indicate the mounting angle type, are 50, 60, 70, 80, 01, 02, 03, 04, 05, 06, 07 or 08, water-proof construction is needed if installing outdoor.

5. When the first 2 digits of the model number, which indicate the mounting angle type, are 10, 20, 30 or 40, water-proof construction is not required whether it is outdoor or not.

Note

Ordering Information

When ordering, please specify;

1) Model Number: VFR
2) Nominal size X full port or 40% port
3) Rating of valve body
4) Materials of valve body and trims, and necessity of hardening treatment
5) Type of actuator and air supply pressure
6) Valve action (direct or reverse)
7) Accessories (positioner, pressure regulator with filter, etc.)
8) Special requirements for oil / copper free treatment, etc.
9) Name of flow medium
10) Normal flow and maximum flow
11) Pressure of flow medium, upstream and downstream pressure at fully closed and open positions
12) Process fluid temperature and specific gravity
13) Viscosity of flow medium, inclusive or exclusive slurry or flushing
14) Indoor or outdoor usage

Please read “Terms and Conditions” from the following URL before ordering and use.
https://www.azbil.com/products/factory/order.html

Specifications are subject to change without notice.

Azbil Corporation
Advanced Automation Company

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Kanagawa 251-8522 Japan
URL: https://www.azbil.com/

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