

Finger Valve Series VHK

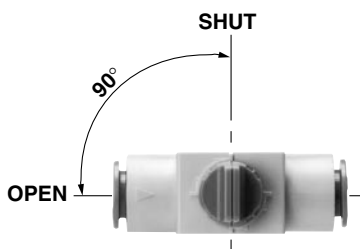
Large effective area: 2.0 to 17.5 mm²
 Small knob operating force: 0.43 to 1.4 kgfcm
 Poppet valve construction with few seal defects

The series begins with the min. tube O.D. of $\phi 4$.
 Selection from four types in accordance with the piping specifications

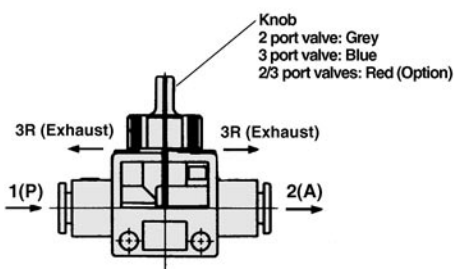
The knob in the SHUT position of 3 port valves discharges residual pressure from side A.
 (There is no exhaust port.)



The valve direction clearly indicates whether the valve is open or closed.
 (SHUT-OPEN: Counterclockwise)



Classification of knob by colour difference facilitates distinction between 2 port valves and 3 port valves



Specifications

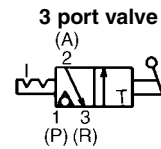
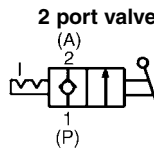
Valve	2/3 port valves
Fluid	Air
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Operating vacume pressure*	-100kPa
Ambient and fluid temperature	0 to 60°C
Applicable tube material (1)	Nylon, Soft nylon, Polyurethane
Accessory (Option)	Bracket



Note 1) Be careful of maximum operating pressure when soft nylon or polyurethane tube is used.

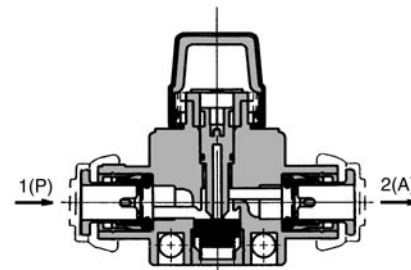
* Use VHK2 (2 port valve) for vacuum application. VHK3 is not suitable for vacuum.

JIS Symbol

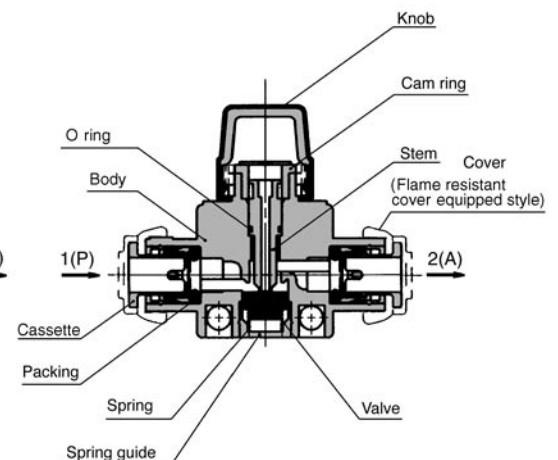


Construction

2 port valve/Series VHK2



3 port valve/Series VHK3



Component Parts

	Standard style	PBT
Body	Flame resistant style	Flame resistant PBT (UL Standard V-0)
	Standard style	PBT
Knob	Flame resistant style	Flame resistant PBT (UL Standard V-0)
	Standard style	PBT
Cover	Flame resistant (UL Standard V-0)CR For flame resistant cover equipped style only	
Cam ring	POM	
Stem	POM	
Spring guide	C3604B Electroless nickel plated	
Spring	SUS304	
Packing, O ring, Valve	NBR	

How to Order

Standard VHK 2 — 02S — 02S R L

Flame resistant VHK 2 R — 04F — 04F R L C

Valve model

2	2 port valve
3	3 port valve

Flame resistant

P port size

04F	ø4
06F	ø6
08F	ø8
10F	ø10
12F	ø12
M5	M5
01S	R(PT)1/8
02S	R(PT)1/4
03S	R(PT)3/8
04S	R(PT)1/2

Bracket

—	None
L	With L bracket

*Bracket and screws are attached.

Flame resistant cover

—	Without cover
C	With cover (For One-touch fitting style only)

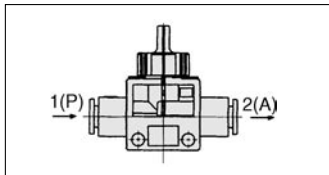
Knob colour

— (Standard)	2 port valve	Grey
— (Standard)	3 port valve	Blue
R (Option)	2 port valve	Red
R (Option)	3 port valve	Red

A port size

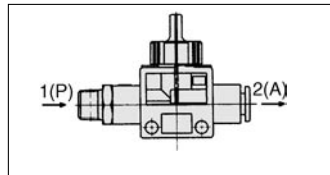
04F	ø4
06F	ø6
08F	ø8
10F	ø10
12F	ø12
M5	M5
01S	R(PT)1/8
02S	R(PT)1/4
03S	R(PT)3/8
04S	R(PT)1/2

Standard



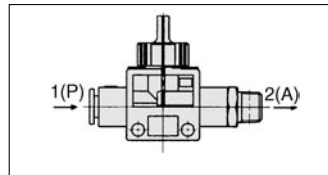
1(P): One-touch/2(A): One-touch

		2(A) Applicable tube O.D. (mm)				
		ø4	ø6	ø8	ø10	ø12
1(P) Tube O.D. (mm)	ø4	●				
	ø6	●	●			
	ø8		●	●		
	ø10			●	●	
	ø12				●	●



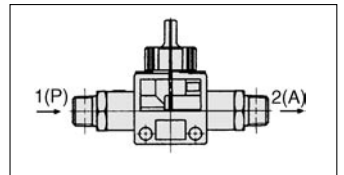
1(P): Male thread/2(A): One-touch

		2(A) Applicable tube O.D. (mm)				
		ø4	ø6	ø8	ø10	ø12
1(P) Port size R(PT)	M5	●	●			
	1/8	●	●	●		
	1/4		●	●	●	●
	3/8		●	●	●	●
	1/2				●	●



1(P): One-touch/2(A): Male thread

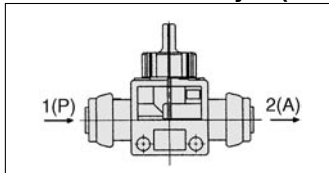
		2(A) Port size R(PT)				
		M5	1/8	1/4	3/8	1/2
1(P) Tube O.D. (mm)	ø4	●	●			
	ø6	●	●	●	●	
	ø8		●	●	●	
	ø10			●	●	●
	ø12				●	●



1(P): Male thread/2(A): Male thread

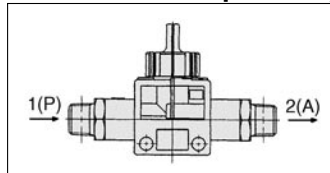
		2(A) Port size R(PT)				
		M5	1/8	1/4	3/8	1/2
1(P) Port size R(PT)	M5	●				
	1/8	●	●			
	1/4		●	●		
	3/8			●	●	
	1/2				●	●

Flame resistant style (UL-94 Standard V-0 equivalent)



1(P): One-touch/2(A): One-touch

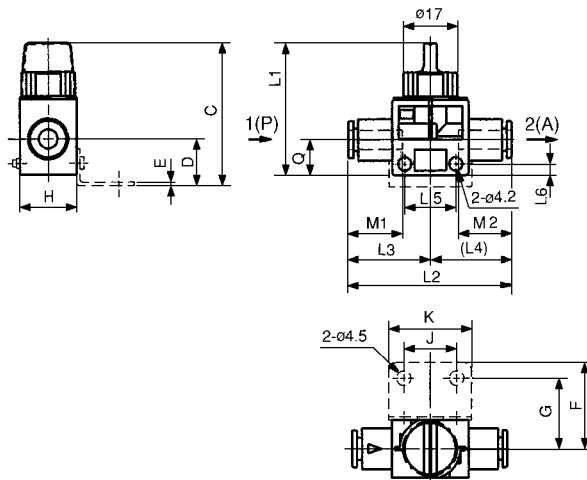
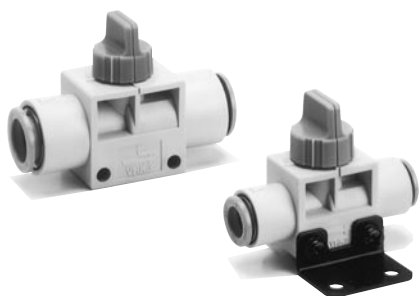
		2(A) Applicable tube O.D. (mm)				
		ø4	ø6	ø8	ø10	ø12
1(P) Tube O.D. (mm)	ø4	●				
	ø6		●			
	ø8			●		
	ø10				●	
	ø12					●



1(P): Male thread/2(A): Male thread

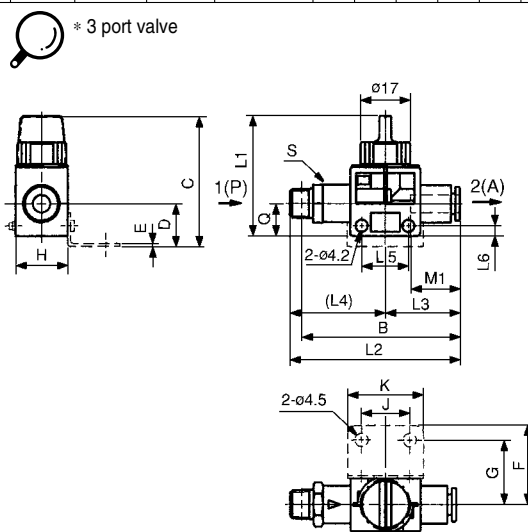
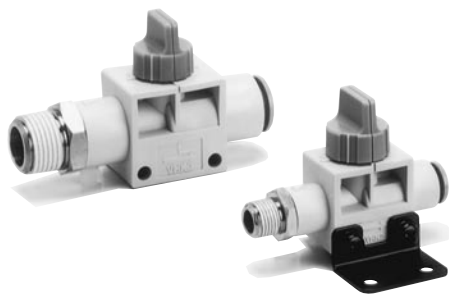
		2(A) Port size R(PT)			
		1/8	1/4	3/8	1/2
1(P) Port size R(PT)	1/8	●			
	1/4		●		
	3/8			●	
	1/2				●

1(P)/2(A): One-touch fitting



Tube O.D. (mm)		Model	H	L1	L2	L3	L4	L5	L6	M1	M2	Q	Effective area (mm ²)		Weight (g)	Bracket mounting dimension							
1(P)	2(A)												1(P)→2(A)	2(A)→3(R)*		Bracket ass'y No.	C	D	E	F	G	J	K
4	4	VHK□-04F-04F	18	41	47.6	23.8	23.8	16.5	3.5	15.8	11	11	3.4	1.2	15	VHK-B1A	44.5	14.5	1	27	22	16.5	26
6	4	VHK□-06F-04F	18	41	48	24.3	23.7	16.5	3.5	16.8	15.8	11	5.1	1.2	15	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	6	VHK□-06F-06F			48.6		24.3						16.8		7.2								
8	6	VHK□-08F-06F	18	41	50.5	26.2	24.3	16.5	3.5	18.7	16.8	11	9	1.2	16	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	8	VHK□-08F-08F			52.4		26.2						18.7		9.7								
10	8	VHK□-10F-08F	22	46	58.5	30.5	28	21.5	4	20.8	18.7	14	13.7	3.2	28	VHK-B2A	49	17	1	30	25	21.5	31
	10	VHK□-10F-10F			61		30.5						20.8		16.1								
12	10	VHK□-12F-10F	22	46	62	31.5	30.5	21.5	4	21.8	20.8	14	17	3.2	31	VHK-B2A	49	17	1	30	25	21.5	31
	12	VHK□-12F-12F			63		31.5						21.8		17.5								

1(P): Male thread, 2(A): One-touch fitting

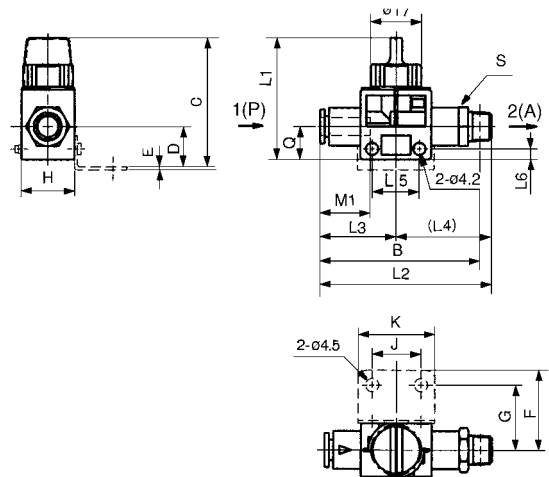
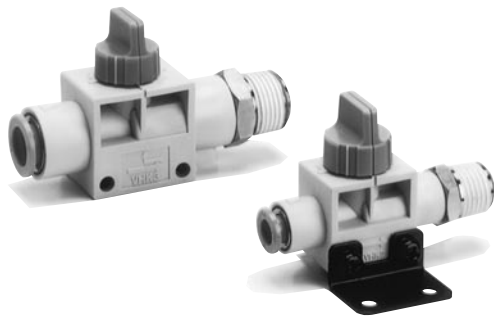


Connection thread R(PT)	Tube O.D. (mm)	Model	H	L1	L2	L3	L4	L5	L6	M1	Q	Effective area (mm ²)		Weight (g)	B**	S (Width across flats)	Bracket mounting dimension							
												1(P)→2(A)	2(A)→3(R)*				Bracket ass'y No.	C	D	E	F	G	J	K
M5	4	VHK□-M5-04F	18	41	52.9	23.8	29.1	16.5	3.5	15.8	11	2.0	1.2	19	49	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	6	VHK□-M5-06F			53.9	24.3	29.6						16.8	21	50	13								
1/8	4	VHK□-01S-04F	18	41	55.4	23.8	31.6	16.5	3.5	16.8	11	3.4	1.2	21	51	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	6	VHK□-01S-06F			56.9	24.3	32.6							18.7	23	53								
1/4	8	VHK□-01S-08F	18	41	62.2	26.2	36	16.5	3.5	18.7	11	7.2	1.2	31	58	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	6	VHK□-02S-06F			60.4	24.3	36.1							16.8	31	54								
1/4	8	VHK□-02S-08F	18	41	65.2	26.2	39	16.5	3.5	18.7	11	9.7	1.2	32	59	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	10	VHK□-02S-10F			73.8	30.5	43.3					20.8		49	68	19								
1/4	12	VHK□-02S-12F	22	46	76.3	31.5	44.8	21.5	4	21.8	14	17.5	3.2	63	70	22	VHK-B2A	49	17		30	25	21.5	31
	6	VHK□-03S-06F	18	41	62.4	24.3	38.1	16.5	3.5	16.8	11	7.2	1.2	41	56	17	VHK-B1A	44.5	11.5	1	27	22	16.5	26
8	VHK□-03S-08F	66.2			26.2	40	18.7							40	60									
3/8	10	VHK□-03S-10F	22	46	74.8	30.5	44.3	21.5	4	20.8	14	16.1	3.2	51	68	19	VHK-B2A	49	17	1	30	25	21.5	31
	12	VHK□-03S-12F			77.3	31.5	45.8					21.8		64	71	22								
1/2	10	VHK□-04S-10F	22	46	78.2	30.5	47.7	21.5	4	20.8	14	16.1	3.2	72	70	22	VHK-B2A	49	17	1	30	25	21.5	31
	12	VHK□-04S-12F			80.2	31.5	48.7					21.8		70	72									



*3 port valve
**Reference dimensions after insertion of R(PT) threads.

1(P): One-touch fitting, 2(A): Male thread

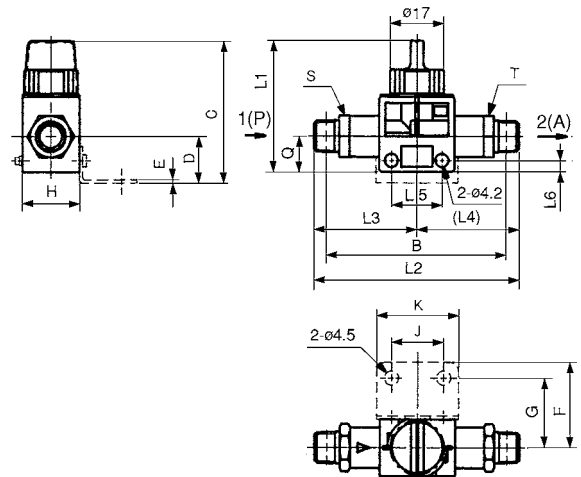
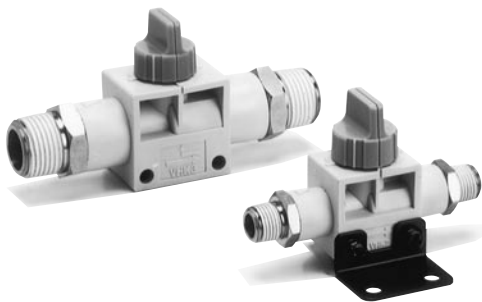


Tube O.D. (mm)	Connection thread R(PT)		Model	H	L1	L2	L3	L4	L5	L6	M1	Q	Effective area (mm ²)		Weight (g)	B** (Width across flats)	S (Width across flats)	Bracket mounting dimension											
	1(P)	2(A)											1(P)→2(A)	2(A)→3(R)*				Bracket ass'y No.	C	D	E	F	G	J	K				
4	M5	VHK□-04F-M5	18	41	52.9	23.8	29.1	16.5	3.5	15.8	11	2.0	1.2	19	49	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26					
	1/8	VHK□-04F-01S																							32.6	31.6	21	51	13
6	M5	VHK□-06F-M5	18	41	53.9	29.6	32.6	16.5	3.5	16.8	11	7.2	1.2	23	53	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26					
	1/8	VHK□-06F-01S																							36.1	36.1	31	54	17
	1/4	VHK□-06F-02S																							60.4	36.1	41	56	14
	3/8	VHK□-06F-03S																							62.4	38.1	31	58	17
8	1/8	VHK□-08F-01S	18	41	62.2	36	39	16.5	3.5	18.7	11	9.7	1.2	32	59	19	VHK-B1A	44.5	14.5	1	27	22	16.5	26					
	1/4	VHK□-08F-02S																							66.2	40	40	60	22
	3/8	VHK□-08F-03S																							73.8	43.3	49	68	17
10	1/4	VHK□-10F-02S	22	46	74.8	30.5	44.3	21.5	4	20.8	14	16.1	3.2	51	68	17	VHK-B2A	49	17	1	30	25	21.5	31					
	3/8	VHK□-10F-03S																							78.2	47.7	72	70	19
	1/2	VHK□-10F-04S																							76.3	44.8	63	70	19
12	1/4	VHK□-12F-02S	22	46	77.3	31.5	45.8	21.5	4	21.8	14	17.5	3.2	64	71	22	VHK-B2A	49	17	1	30	25	21.5	31					
	3/8	VHK□-12F-03S																							80.2	48.7	64	71	22
	1/2	VHK□-12F-04S																							80.2	48.7	70	72	22



* 3 port valve **Reference dimensions after insertion of R(PT) threads.

1(P)/2(A): Male thread



Connection thread R(PT)		Model	H	L1	L2	L3	L4	L5	L6	Q	Effective area (mm ²)		Weight (g)	B** (Width across flats)	S (Width across flats)	T (Width across flats)	Bracket mounting dimension							
1(P)	2(A)										1(P)→2(A)	2(A)→3(R)*					Bracket ass'y No.	C	D	E	F	G	J	K
M5	M5	VHK□-M5-M5	18	41	58.2	29.1	29.1	16.5	3.5	11	2.0	1.2	23	51	11	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26
1/8	M5	VHK□-01S-M5																						
	1/8	VHK□-01S-01S	65.2	32.6	8.6	30	57	13	13															
1/4	1/8	VHK□-02S-01S	18	41	71.6	39	32.6	16.5	3.5	11	9.0	1.2	39	62	17	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	1/4	VHK□-02S-02S																						
3/8	1/4	VHK□-03S-02S	22	46	85.1	44.3	40.8	21.5	4	14	13.7	3.2	65	73	19	17	VHK-B2A	49	17	1	30	25	21.5	31
	3/8	VHK□-03S-03S																						
1/2	3/8	VHK□-04S-03S	22	46	93	48.7	44.3	21.5	4	14	15.1	3.2	90	79	22	19	VHK-B2A	49	17	1	30	25	21.5	31
	1/2	VHK□-04S-04S																						



* 3 port valve **Reference dimensions after insertion of R(PT) threads.

⚠ Precautions

Design

⚠ Warning

- ① Contact SMC if using fluids other than air.
- ② Do not supply air pressure from 2(A) port. The air will leak to 1(P) port.
- ③ Since the valve may have slight air leakage, it may not be suitable for holding pressure in a pressure vessel.

Selection

⚠ Caution

Operation method:
To stop the knob in a midway position can cause malfunction.
Switch it to ON or OFF quickly and firmly.

Mounting

⚠ Caution

L type bracket mounting:
Tightening torque of 0.5 to 0.6 N should be applied to the bolts when mounting the bracket to the body.

Piping

⚠ Caution

Precautions for handling the male threads of the R (PT) pipe fitting with a seal;

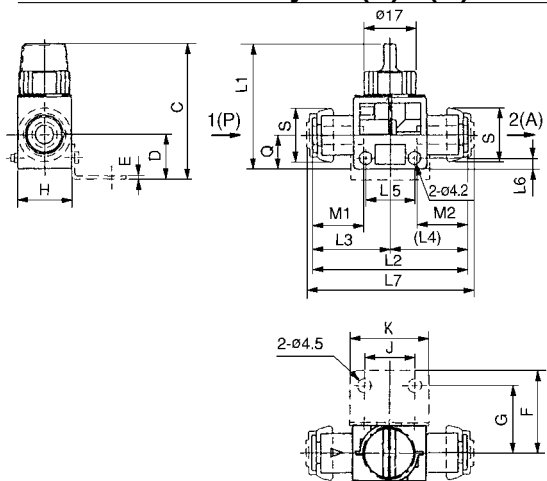
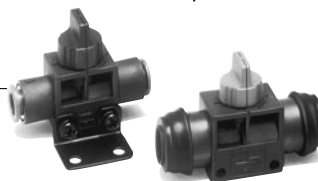
- ① Use a wrench to secure the hexagon portion to screw in the fitting. If the size of the wrench is not appropriate it will be stripped.
- ② To screw in the fitting, first hand-tighten; then, use a tool to rotate it 2 to 3 turns. If it is tightened excessively, the amount of sealing agent that protrudes will increase, so make sure to remove the sealing agent that has protruded.
- ③ Re-use of fittings:
 - (1) Ordinarily, the fitting can be reused 2 to 3 times.
 - (2) Using an air blower, remove the sealing agent that is peeling from the removed pipe fitting before reusing the fitting. If the peeled sealing agent enters the peripheral equipment, it could cause air leakage.
 - (3) If the sealing effect has been lost, place a seal tape over the sealing agent to reuse the fitting. Do not use any other agent except a seal tape.

One-touch fitting

⚠ Caution

- (1) When tubes other than SMC's are used, verify that the tube O.D. satisfies the following accuracy;
 - Nylon tube.....Within ± 0.1 mm
 - Soft nylon tube.....Within ± 0.1 mm
 - Polyurethane tube.....Within $+0.1$ mm, -0.2 mm
 If the tube's external accuracy is not satisfied, it might not be possible to connect the tube or after it is connected, it could lead to air leakage or cause the tube to pull out.

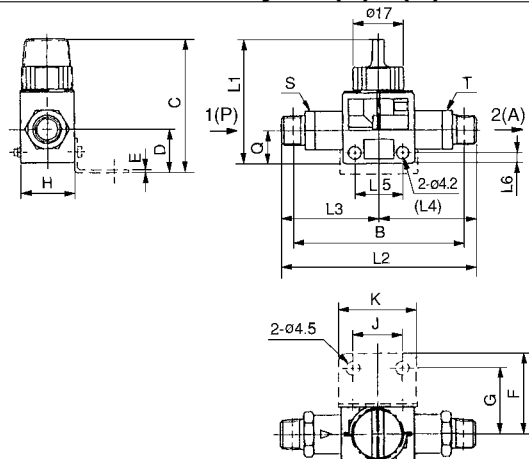
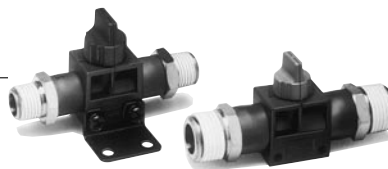
Flame resistant style 1(P)/2(A): One-touch fitting



Tube O.D (mm)	Model	H	L1	L2	L3	L4	L5	L6	L7	Q	M1	M2	Effective area (mm ²)	
													1(P)→2(A)	2(A)→3(R)
4	VHK□R-04F-04F	18	41	47.6	23.8	23.8	16.5	3.5	51.6	11	15.8	15.8	3.4	1.2
6	VHK□R-06F-06F	18	41	48.6	24.3	24.3	16.5	3.5	52.6	11	16.8	16.8	7.2	1.2
8	VHK□R-08F-08F	18	41	52.4	26.2	26.2	16.5	3.5	56.4	11	18.7	18.7	9.7	1.2
10	VHK□R-10F-10F	22	46	61	30.5	30.5	21.5	4	65	14	20.8	20.8	16.1	3.2
12	VHK□R-12F-12F	22	46	63	31.5	31.5	21.5	4	67	14	21.8	21.8	17.5	3.2

Tube O.D (mm)	Model	Weight (g)	S	Bracket mounting dimensions							
				Bracket ass'y No.	C	D	E	F	G	J	K
4	VHK□R-04F-04F	15	14.4	VHK-B1A	44.5	14.5	1	27	22	16.5	26
6	VHK□R-06F-06F	16	16.8	VHK-B1A	44.5	14.5	1	27	22	16.5	26
8	VHK□R-08F-08F	17	19.2	VHK-B1A	44.5	14.5	1	27	22	16.5	26
10	VHK□R-10F-10F	29	23.3	VHK-B2A	49	17	1	30	25	21.5	31
12	VHK□R-12F-12F	32	25.7	VHK-B2A	49	17	1	30	25	21.5	31

Flame resistant style 1(P)/2(A): Male thread

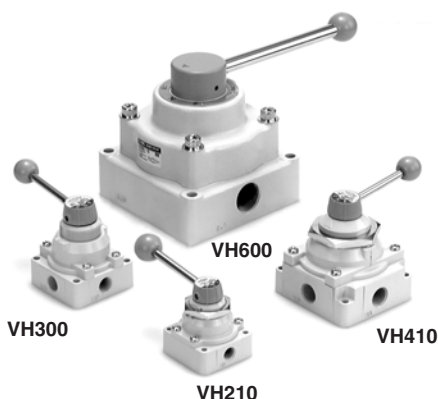


*Reference dimensions after insertion of R(PT) thread

Connection thread R(PT)	Model	H	L1	L2	L3	L4	L5	L6	Q	B*	Effective area (mm ²)		Weight (g)
											1(P)→2(A)	2(A)→3(R)	
1/8	VHK□R-01S-01S	18	41	65.2	32.6	32.6	16.5	3.5	11	57	8.6	1.2	30
1/4	VHK□R-02S-02S	18	41	78	39	39	16.5	3.5	11	66	9.7	1.2	47
3/8	VHK□R-03S-03S	22	46	88.6	44.3	44.3	21.5	4	14	76	16.1	3.2	72
1/2	VHK□R-04S-04S	22	46	97.4	48.7	48.7	21.5	4	14	81	17.5	3.2	101

Connection thread R(PT)	Model	S (Width across flats)	T (Width across flats)	Bracket mounting dimensions							
				Bracket ass'y No.	C	D	E	F	G	J	K
1/8	VHK□R-01S-01S	13	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26
1/4	VHK□R-02S-02S	17	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26
3/8	VHK□R-03S-03S	19	19	VHK-B2A	49	17	1	30	25	21.5	31
1/2	VHK□R-04S-04S	22	22	VHK-B2A	49	17	1	30	25	21.5	31

Hand Valve Series VH



Standard Specifications

Fluid		Air
Standard specifications		1.5MPa
Max.operating pressure	VH200, 300,400	1.0MPa
	VH600	0.7MPa
Ambient and fluid temperature		-5 to 60°C (No freezing)
Operating angle		90°
Lubrication		Not required/When lubricated, use turbine oil # 1 (ISO VG32)

Optional Specifications

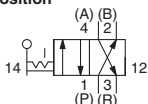
Bottom piping	VH300, 400
Panel mount	VH200, 300, 400
Different P port location (On handle side)	All models applicable*

* Note that 1(P) port of VH600 is located on handle side as standard.

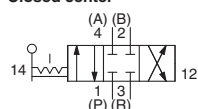
Models

Symbol

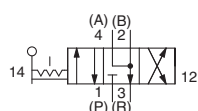
2 Position



Closed center

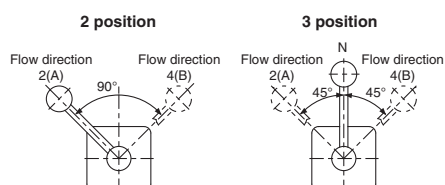


Exhaust center



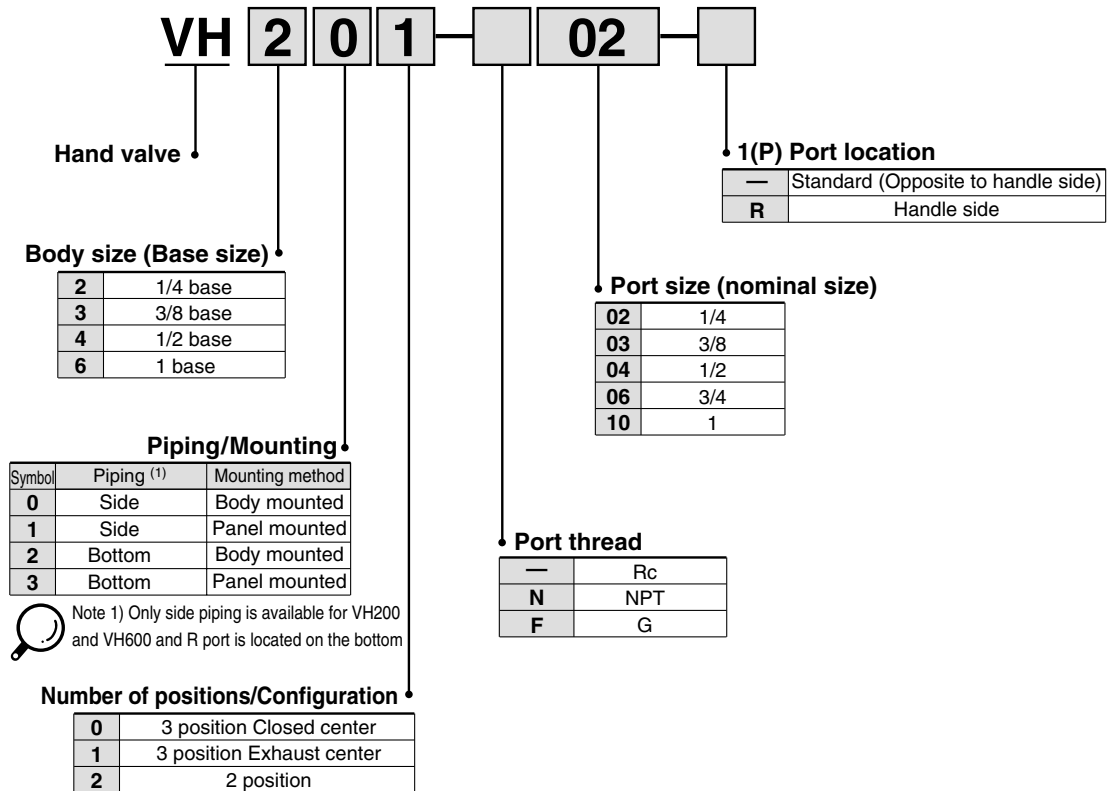
Handle operation angle and air flow direction

(Refer to figures of porting direction in the right.)

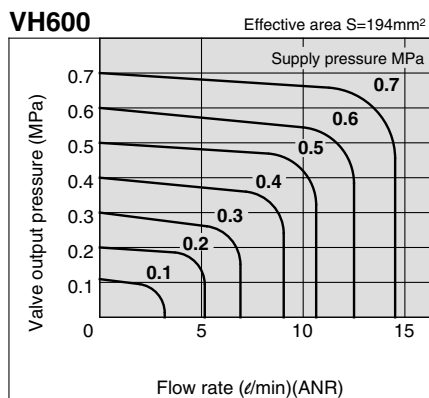
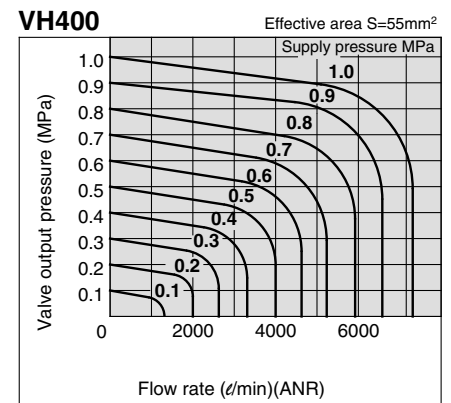
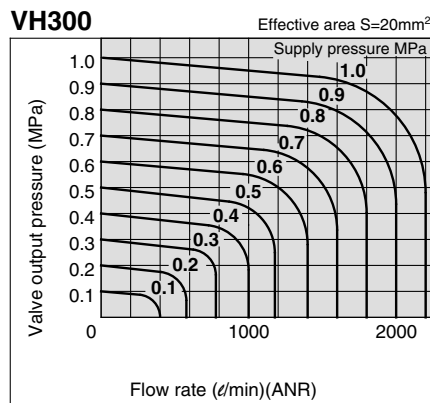
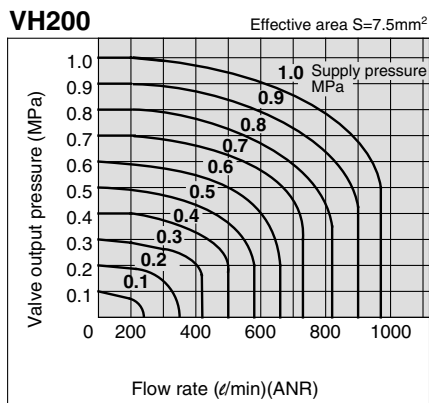


Series	Port Size	Number of positions	Piping direction	Model		Effective area (mm ²) (N ₂ /min factor)	Weight (kg)	
				Body mounted	Panel mounted			
VH2	1/4	3 (Closed center)		VH200-02	VH210-02	7.5(356.60)	0.42	
		3 (Exhaust center)		VH201-02	VH211-02			
		2 (Position)		VH202-02	VH212-02			
VH3	1/4, 3/8	3 (Closed center)		VH300-02, 03	VH310-02, 03	1/4: 17(802.35)	0.71	
		3 (Exhaust center)		VH301-02, 03	VH311-02, 03			
		2 (Position)		VH302-02, 03	VH312-02, 03			
		3 (Closed center)		VH320-02, 03	VH330-02, 03			3/8: 20(980.65)
		3 (Exhaust center)		VH321-02, 03	VH331-02, 03			
		2 (Position)		VH322-02, 03	VH332-02, 03			
VH4	1/4 to 3/4	3 (Closed center)		VH400-02 to 06	VH410-02 to 06	1/4: 45(2228.75)	1.28	
		3 (Exhaust center)		VH401-02 to 06	VH411-02 to 06			
		2 (Position)		VH402-02 to 06	VH412-02 to 06			3/8: 49(2407.05)
		3 (Closed center)		VH420-02 to 06	VH430-02 to 06			
		3 (Exhaust center)		VH421-02 to 06	VH431-02 to 06			
		2 (Position)		VH422-02 to 06	VH432-02 to 06			1/2: 55(2763.65)
VH6	3/4, 1	3 (Closed center)		VH600-06, 10	—	3/4: 185(9093.30)	9.7	
					1: 194(9360.75)			

How to Order



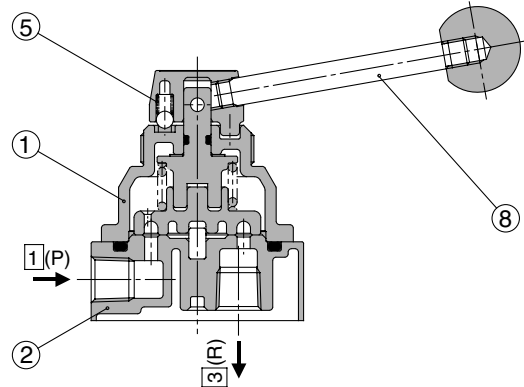
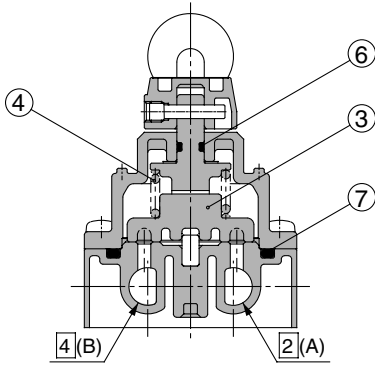
Flow Characteristics



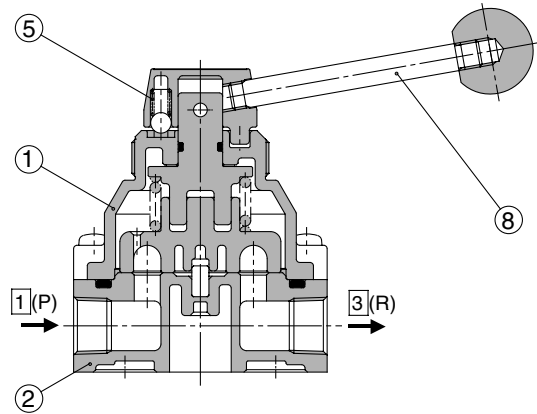
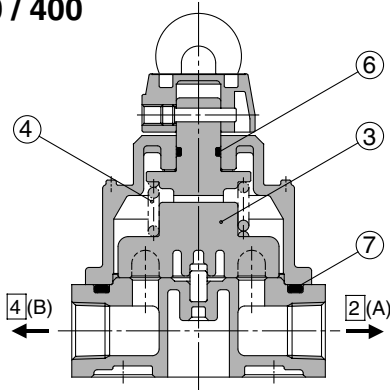
Series VH

Construction

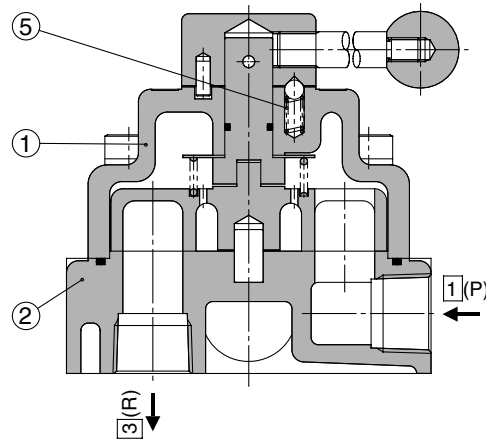
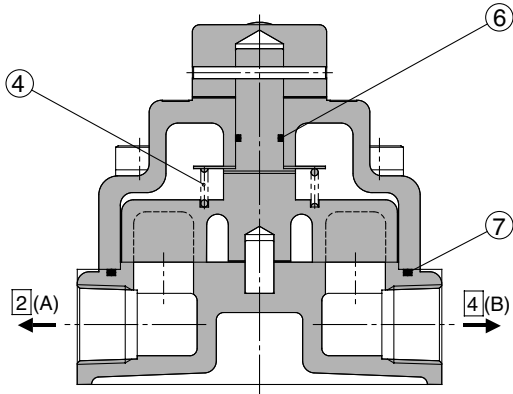
VH200



VH300 / 400



VH600



Component Parts

No.	Description	Material	
		VH200/300/400	VH600
1	Cover	Zinc die cast	Cast iron
2	Body	Aluminium die cast	Cast iron

Replacement Parts: Seal Kits

No.	Description	Material	Part No.			
			VH200	VH300	VH400	VH600
3	Slide ring	Resin	24404 (24404-1)	24414 (24414-1)	24423 (24423-1)	—
4	Slide ring spring	Piano wire	24408	24416	24425	240417
5	Slide ball spring	Piano wire	24077	240359	240359	24047
6	O ring	NBR	JIS B2401 P5	JIS B2401 P10	JIS B2401 P10	JIS B2401 P15
7	O ring	NBR	JIS B2401 P42	JIS B2401 G55	JIS B2401 P71	JIS B2401 G120
8	Handle rod assembly	—	2407102A	2407102A	2407102A	—

Part No. of lock nut for panel mount

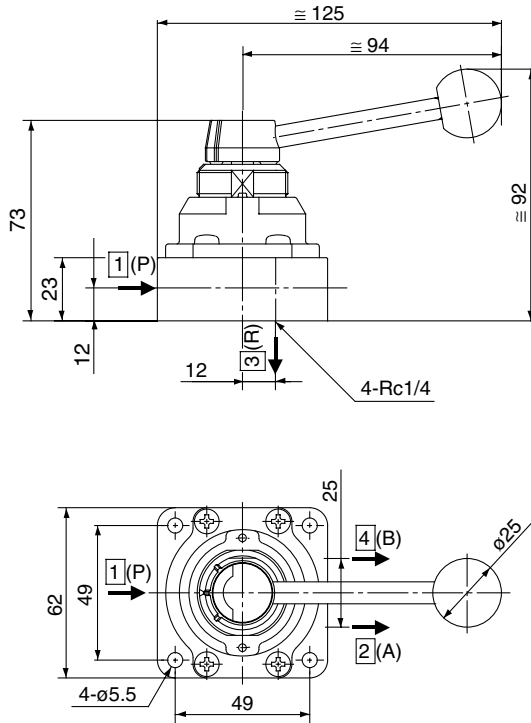
Series	Part No.
VH200	244010
VH300	24418
VH400	240258

*(): Exhaust center

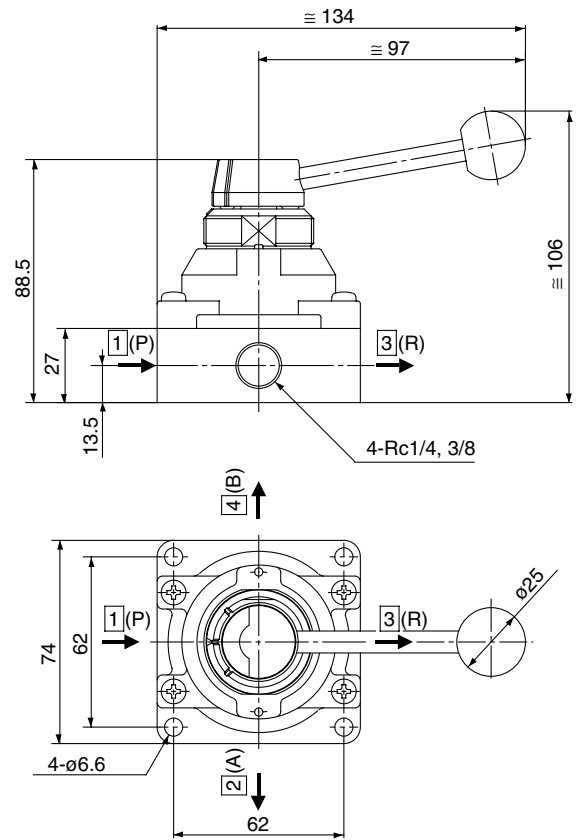


Body Mounted/Dimensions

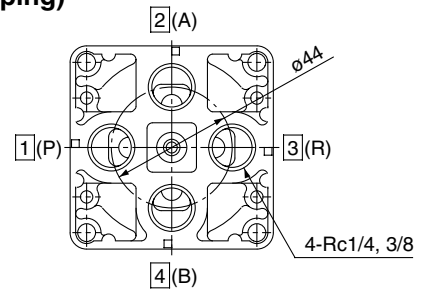
VH20□-02



VH30□-02 to 03



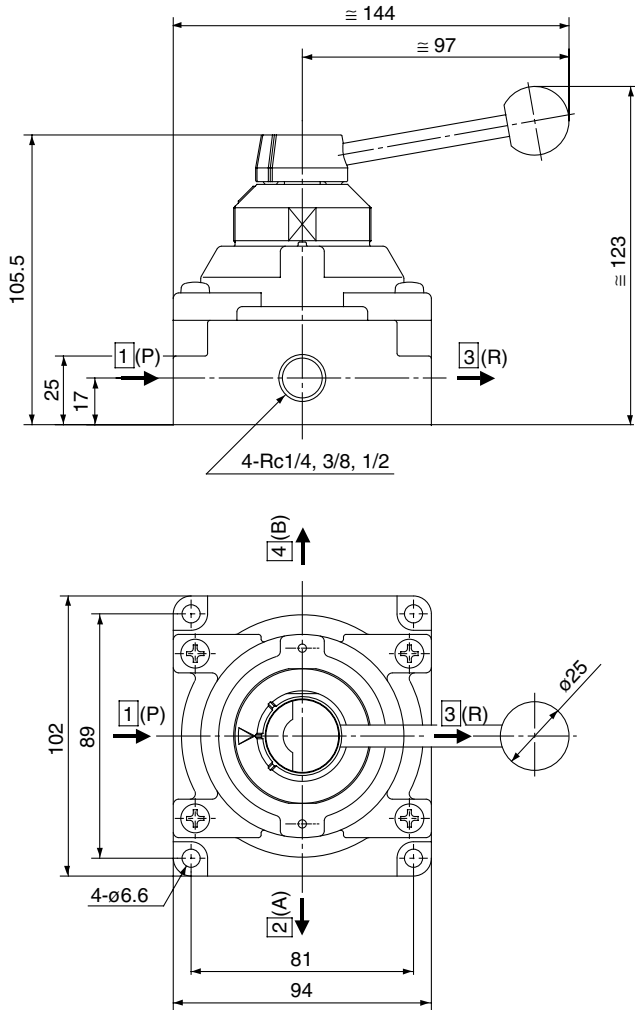
VH32□-02 to 03 (Bottom piping)



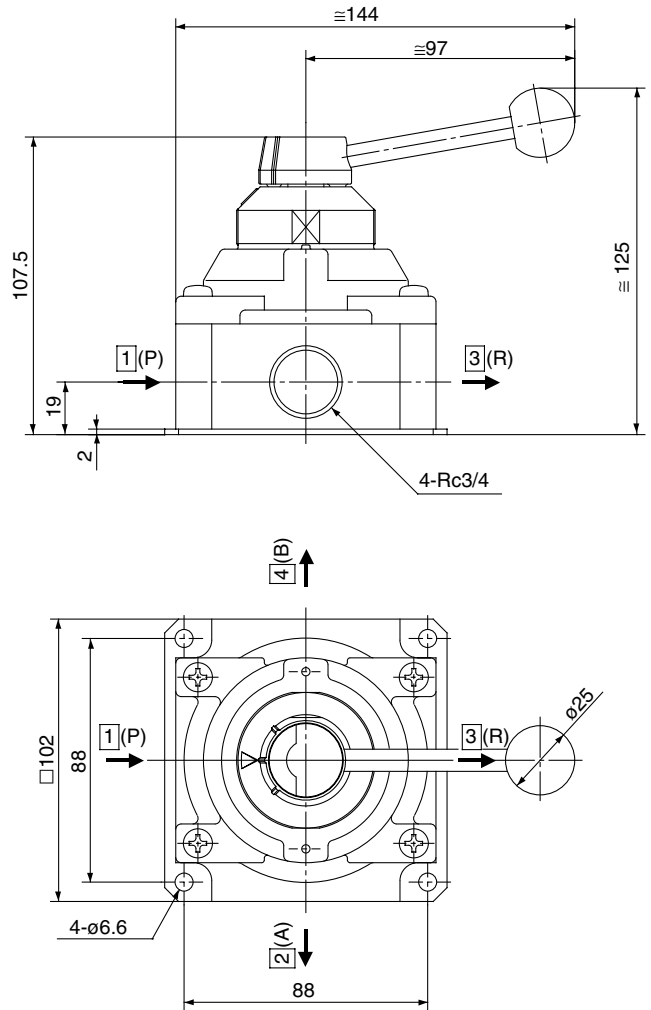
Series VH

Body Mounted/Dimensions

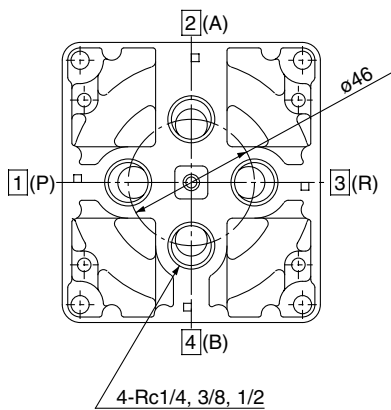
VH40□-02 to 04



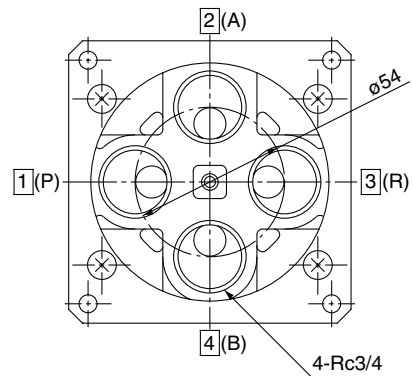
VH40□-06



VH42□-02 to 04
(Bottom piping)

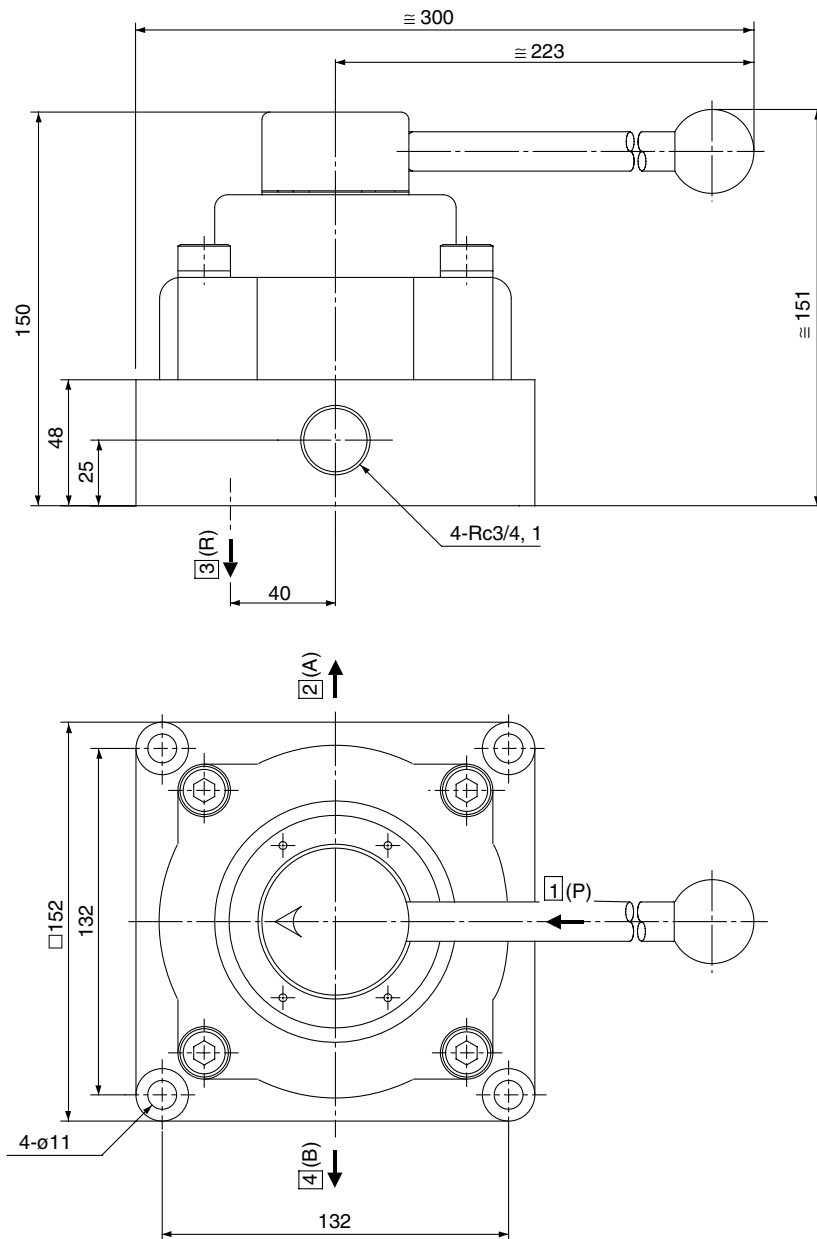


VH42□-06
(Bottom piping)



Body Mounted/Dimensions

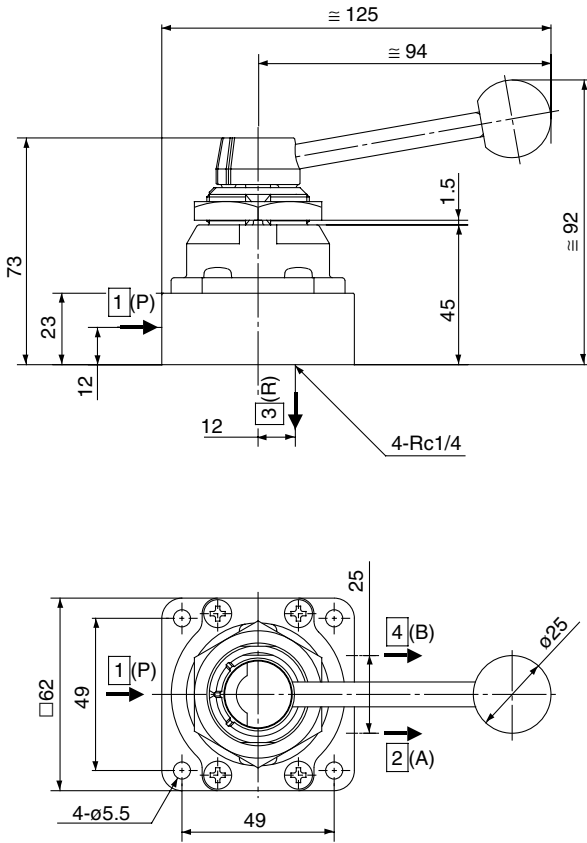
VH600-06/10



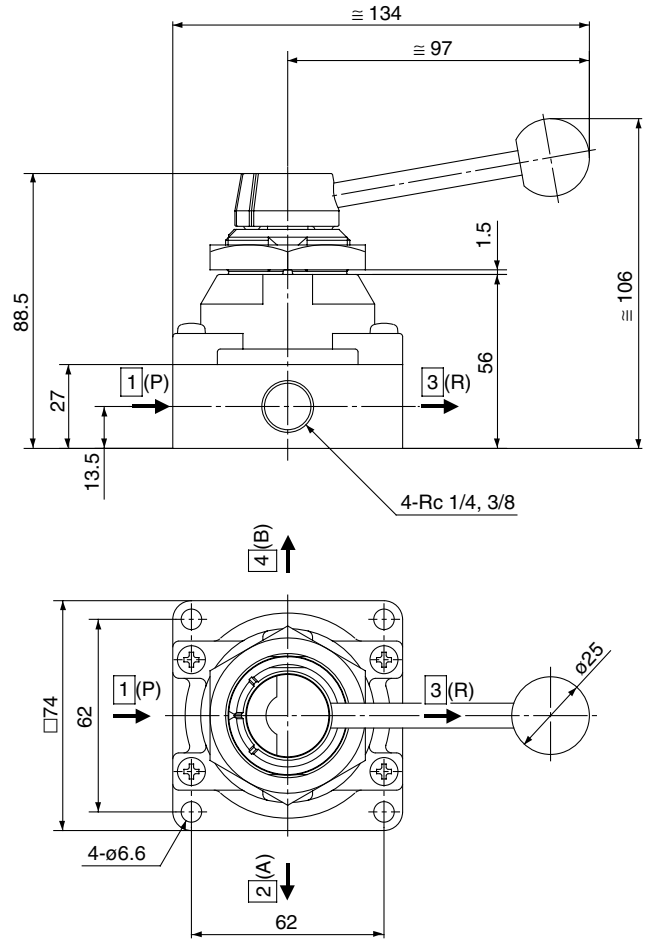
Series VH

Panel Mounted/Dimensions

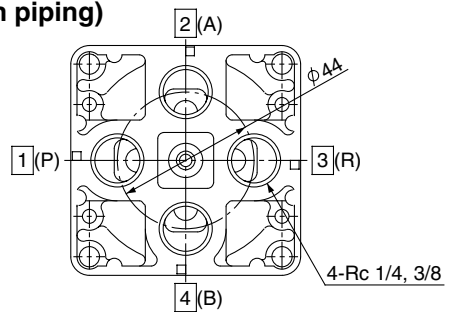
VH21□-02



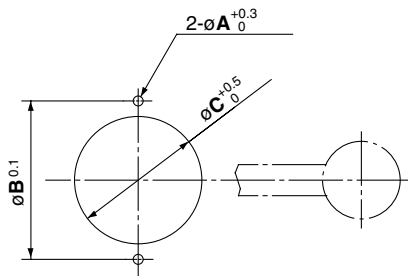
VH31□-02 to 03



VH33□-02 to 03 (Bottom piping)



Panel cut dimension

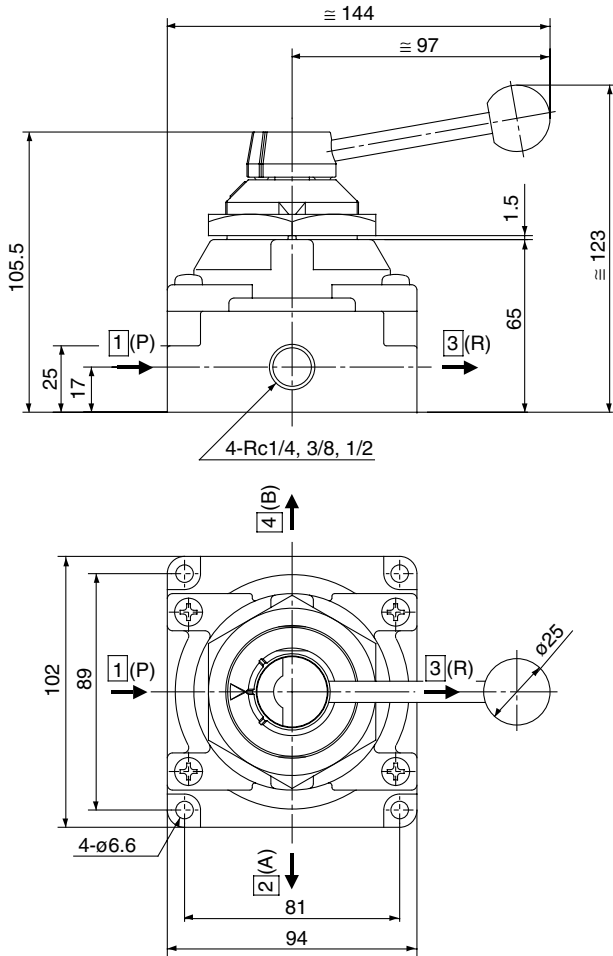


Max. panel thickness D

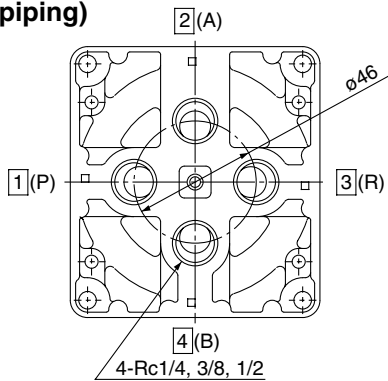
Model	A	B	C	D (mm)
VH200	3.2	40	35	3.5
VH300	3.2	51	41	6
VH400	3.2	64	51	8

Panel Mounted/Dimensions

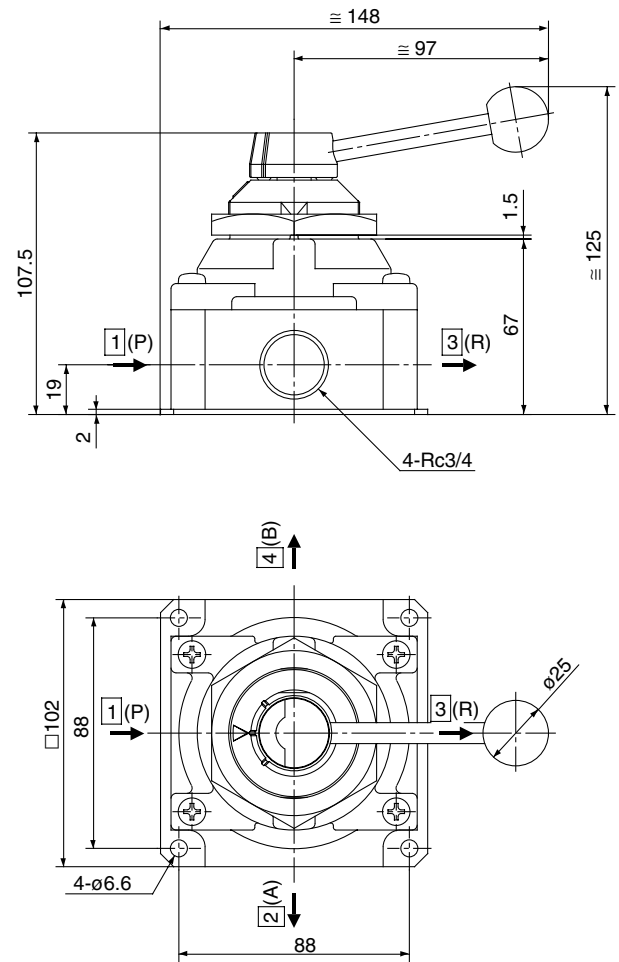
VH41□-02 to 04



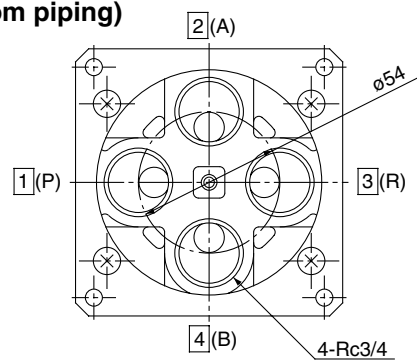
VH43□-02 to 04 (Bottom piping)



VH41□-06



VH43□-06 (Bottom piping)



 **Precautions****Design** **Warning**

- ① **Not suitable for use as a selector valve or a divider valve.**
The valve can malfunction due to air leakage
- ② **Not suitable for vacuum applications.**
The valve can malfunction due to air leakage.
- ③ **Do not supply air pressure from other ports than 1(P) port.**
The valve may have air leakage when air pressure is supplied from other ports.

Selection **Caution**

- ① **Use in low temperature environments**
The valve can be used at a temperature down to -5°C . Take appropriate measures to avoid freezing of drainage, moisture, etc.
- ② **Operation method**
To stop the valve midway can cause malfunction.
Switch the valve to each position quickly and firmly.

Piping **Caution**

- ① **Ensure connection so that air is supplied to the port "1(P)"**
Valve may have air leakage when air pressure is supplied from other ports.
- ② **Note that in case of the option of different "1(P)" porting position, porting indication on the body and flow direction by handle operation are reversed.**

Environment **Warning**

- ① **When the valve is installed in an atmosphere where there is a lot of dust, install a silencer into the port "3(R)".**
When dust enters the valve from the port "3(R), it may cause malfunction.