

# Finger Valve

## Series VHK

Large effective area: 2.0 to 17.5 mm<sup>2</sup>

Small knob operating force: 0.04 to 0.14 N·m

Poppet valve construction seldom suffers seal defection.

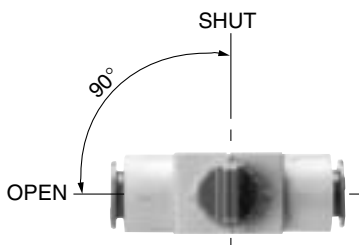
The series begins with the min. tubing O.D. of ø4.

Selection from four types in accordance with the piping specifications

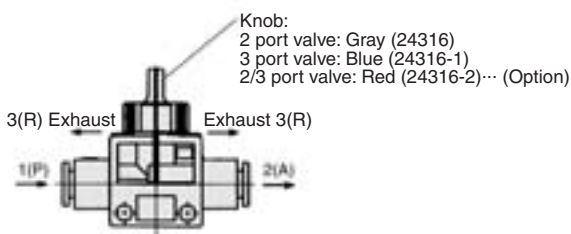
The 3 port valve discharges residual pressure from 2(A) with the handle set at SHUT.  
(There is no exhaust port.)



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



2 port valves and 3 port valves can be distinguished by the color of their knobs.



### Specifications

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

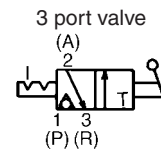
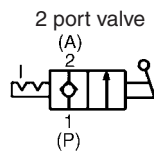


Note 1) Please note that when the valve is used at micro pressures of 0.1 MPa or less, valve leakage may be more than the standard value (5 cm<sup>3</sup>/min).

Note 2) Use caution about the maximum operating pressure when soft nylon or polyurethane tubing is used. (Refer to Best Pneumatics No. 6 for details.)

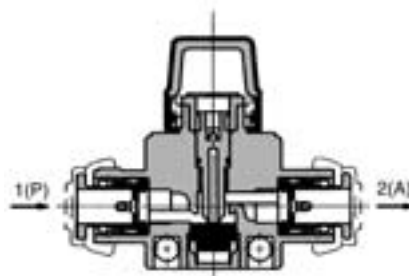
\* Use VHK2 (2 port valve) for vacuum application.

JIS Symbol

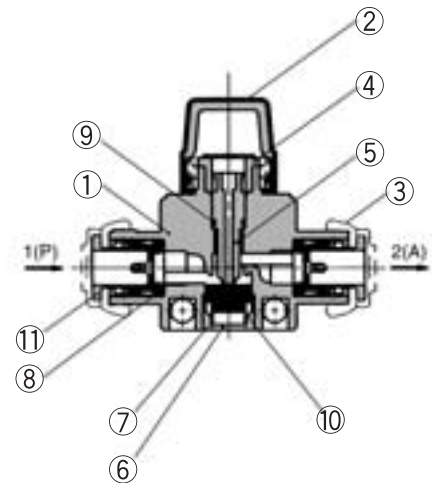


### Construction

2 port valve: Series VHK2



3 port valve: Series VHK3



### Component Parts

No.	Description	Material	Note
1	Body	Standard type	PBT
		Flame resistant type	Flame resistant PBT (UL standard V-0)
2	Knob	Standard type	PBT
		Flame resistant type	Flame resistant PBT (UL standard V-0)
3	Cover	Flame resistant CR (UL standard V-0)	Applicable to the flame-resistant cover only
4	Cam ring	POM	
5	Stem	POM	
6	Spring guide	Brass Electroless nickel plated	
7	Spring	Stainless steel	
8	Seal	NBR	
9	O-ring	NBR	
10	Valve	NBR	
11	Cassette	Standard type	POM
		Flame resistant type	Flame resistant PBT (UL standard V-0)

## How to Order

**Standard type** VHK **2** — **02S** — **02S** [ ] [ ] [ ]

**Flame resistant type** VHK **2** **R** — **04F** — **04F** [ ] [ ] [ ]

**Valve model**

2	2 port valve
3	3 port valve

**Flame resistant type**

04F	ø4
06F	ø6
08F	ø8
10F	ø10
12F	ø12
M5	M5 x 0.8
01S	R 1/8
02S	R 1/4
03S	R 3/8
04S	R 1/2

**1(P) port size**

04F	ø4
06F	ø6
08F	ø8
10F	ø10
12F	ø12
M5	M5 x 0.8
01S	R 1/8
02S	R 1/4
03S	R 3/8
04S	R 1/2

**2(A) port size**

04F	ø4
06F	ø6
08F	ø8
10F	ø10
12F	ø12
M5	M5 x 0.8
01S	R 1/8
02S	R 1/4
03S	R 3/8
04S	R 1/2

**Bracket**

Nil	None
L	With L-bracket

\* Bracket and screws are attached.

**Flame resistant cover**

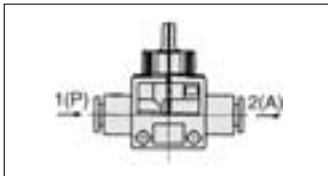
Nil	No
C	With cover (For One-touch fitting only)

**Knob color**

Nil (Standard)	2 port valve	Gray
	3 port valve	Blue
R (Option)	2 port valve	Red
	3 port valve	Red

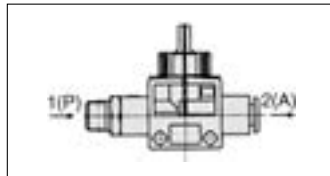
Made to Order  
Refer to page 1925 for details

### Standard Type



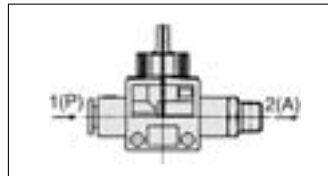
1(P): One-touch fitting  
2(A): One-touch fitting

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



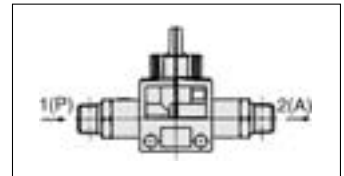
1(P): Male thread  
2(A): One-touch fitting

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



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

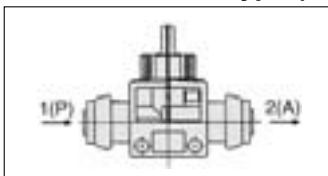
		2(A)					
		Port size R					
Applicable tubing O.D. (mm)	1(P)	M5	1/8	1/4	3/8	1/2	
	ø4	●	●				
	ø6	●	●	●	●		
	ø8		●	●	●	●	
	ø10			●	●	●	●
	ø12				●	●	●



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

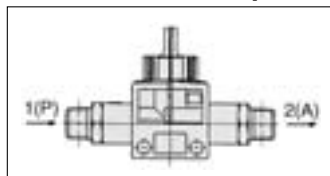
		2(A)					
		Port size R					
Port size R	1(P)	M5	1/8	1/4	3/8	1/2	
	M5	●					
	1/8	●	●				
	1/4		●	●			
	3/8			●	●		
	1/2				●	●	

### Flame Resistant Type (UL-94 Standard V-0 equivalent)



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

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



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

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

VM

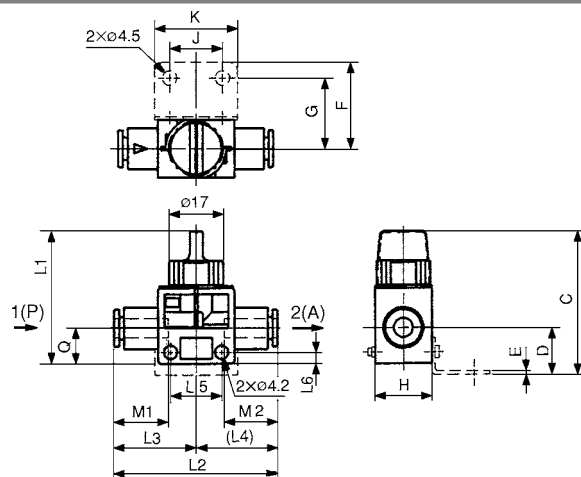
VMG

VR

VH

# Series VHK

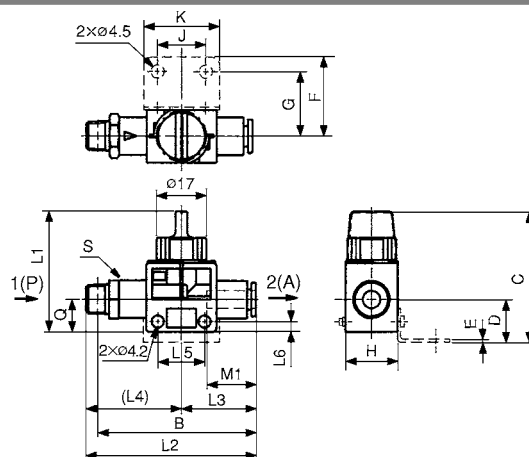
## 1(P)/2(A): One-touch Fitting



Applicable tubing O. D. (mm)		Model	H	L1	L2	L3	L4	L5	L6	M1	M2	Q	Effective area (mm <sup>2</sup> )		Mass (g)	Bracket mounting dimensions							
1(P)	2(A)												1(P)-2(A)	2(A)-3(R)		Bracket assembly 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		16								
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		17								
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		29								
12	10	VHK□-12F-10F	22	46	62	30.5	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		32								

Note) 3 port valve

## 1(P): Male Thread, 2 (A): One-touch Fitting



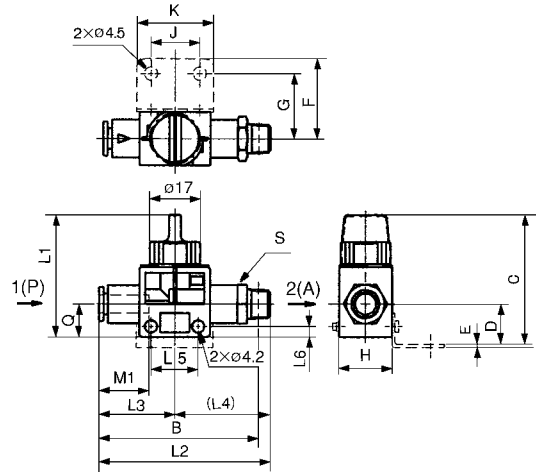
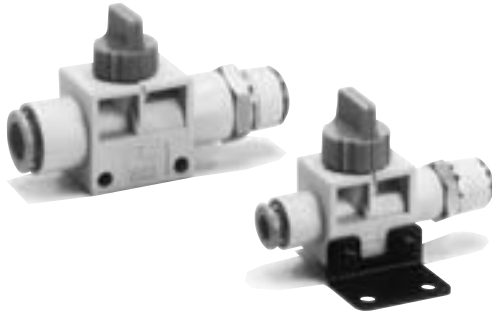
Connection thread R	Applicable tubing O. D. (mm)	Model	H	L1	L2	L3	L4	L5	L6	M1	Q	Effective area (mm <sup>2</sup> )		Mass (g)	B <sup>(2)</sup> (Width across flats)	S (Width across flats)	Bracket mounting dimensions								
												1(P)-2(A)	2(A)-3(R)				Bracket assembly no.	C	D	E	F	G	J	K	
M5	4	VHK□-M5-04F	18	41	52.9	23.8	29.1	16.5	3.5	15.8	11	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	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	13								
1/4	8	VHK□-01S-08F	18	41	62.2	26.2	36	16.5	3.5	18.7	11	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						18.7		31	54	14								
3/8	8	VHK□-02S-08F	18	41	65.2	26.2	39	21.5	4	20.8	14	14	7.2	3.2	32	59	17	VHK-B2A	49	17	1	30	25	21.5	31
	10	VHK□-02S-10F			73.8	30.5	43.3						17.5		49	68	19								
1/2	12	VHK□-02S-12F	22	46	76.3	31.5	44.8	21.5	4	21.8	14	14	17.5	3.2	63	70	22	VHK-B2A	49	17	1	30	25	21.5	31
	6	VHK□-03S-06F			62.4	24.3	38.1						18.7		41	56	17								
3/8	8	VHK□-03S-08F	18	41	66.2	26.2	40	16.5	3.5	18.7	11	11	7.2	1.2	40	60	17	VHK-B1A	44.5	11.5	1	27	22	16.5	26
	10	VHK□-03S-10F			74.8	30.5	44.3						18.7		40	60	17								
1/2	12	VHK□-03S-12F	22	46	77.3	31.5	45.8	21.5	4	21.8	14	14	17.5	3.2	64	71	22	VHK-B2A	49	17	1	30	25	21.5	31
	10	VHK□-04S-10F			78.2	30.5	47.7						18.7		72	70	22								
1/2	12	VHK□-04S-12F	22	46	80.2	31.5	48.7	21.5	4	21.8	14	14	17.5	3.2	70	72	22	VHK-B2A	49	17	1	30	25	21.5	31



Note 1) 3 port valve

Note 2) Reference dimensions after insertion of R thread.

## 1(P): One-touch Fitting, 2(A): Male Thread

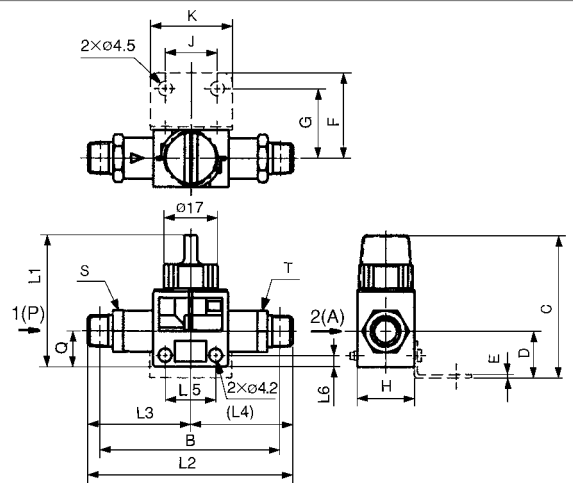
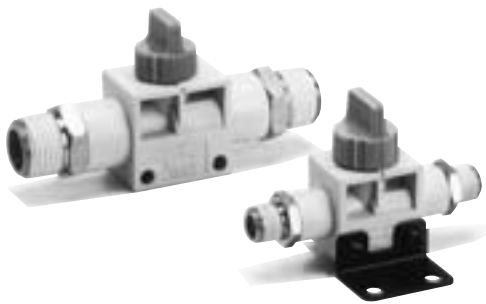


Applicable tubing O. D. (mm)	Connection thread R	Model	H	L1	L2	L3	L4	L5	L6	M1	Q	Effective area (mm <sup>2</sup> )		Mass (g)	B <sup>(2)</sup>	S (Width across flats)	Bracket mounting dimensions									
												1(P)-2(A)	2(A)-3(R)				Bracket assembly no.	C	D	E	F	G	J	K		
4	M5	VHK□-04F-M5	18	41	52.9	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										3.4		21	51	13										
6	M5	VHK□-06F-M5	18	41	53.9	24.3	29.6	16.5	3.5	16.8	11	2.0	1.2	21	50	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	1/8	VHK□-06F-01S										32.6		36.1	23	53									13	
	1/4	VHK□-06F-02S										60.4		36.1	31	54									17	
	3/8	VHK□-06F-03S										62.4		38.1	41	56									14	
8	1/8	VHK□-08F-01S	18	41	62.2	26.2	36	16.5	3.5	18.7	11	9.7	1.2	31	58	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	1/4	VHK□-08F-02S												39	40	32									59	19
	3/8	VHK□-08F-03S												66.2	40	40									60	22
10	1/4	VHK□-10F-02S	22	46	73.8	30.5	43.3	21.5	4	20.8	14	16.1	3.2	49	68	17	VHK-B2A	49	17	1	30	25	21.5	31		
	3/8	VHK□-10F-03S												74.8	47.7	51									70	19
	1/2	VHK□-10F-04S												78.2	47.7	72									70	19
12	1/4	VHK□-12F-02S	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	1	30	25	21.5	31		
	3/8	VHK□-12F-03S												77.3	48.7	64									71	22
	1/2	VHK□-12F-04S												80.2	48.7	70									72	22



Note 1) 3 port valve  
Note 2) Reference dimensions after insertion of R thread.

## 1(P)/2(A): Male Thread



Connection thread R	Model	H	L1	L2	L3	L4	L5	L6	Q	Effective area (mm <sup>2</sup> )		Mass (g)	B <sup>(2)</sup>	S (Width across flats)	T (Width across flats)	Bracket mounting dimensions								
										1(P)-2(A)	2(A)-3(R)					Bracket assembly no.	C	D	E	F	G	J	K	
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	18	41	61.6	32.6	29	16.5	3.5	11	2.0	1.2	26	54	13	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26
	1/8	VHK□-01S-01S									8.6		30	57	30	57								
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									9.7		47	66	17	17								
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									16.1		72	76	19	19								
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									17.5		101	81	22	22								



Note 1) 3 port valve  
Note 2) Reference dimensions after insertion of R thread.

VM□

VMG

VR□

VH□

# Series VHK

## ⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

## Design

### ⚠ Warning

1. Please contact SMC when fluids other than air are used.
2. Do not supply air pressure from 2(A) port. The air will leak out from 1(P) port.
3. Since the valve allows a small volume of air leakage, it may not be suitable for holding pressure in a pressure vessel.

## Selection

### ⚠ Caution

**Operation method:**  
The valve must be switched to OPEN or SHUT instantly and securely. Stopping the handle halfway between the extreme positions may cause malfunction.

## Mounting

### ⚠ Caution

**L type bracket mounting:**  
Apply a tightening torque of 0.5 to 0.6 N·m to the bolts when the bracket is mounted on the body.

## Piping

### ⚠ Caution

**Precautions for handling the male threads of the R pipe fitting with 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, more sealing agent will be forced out. Therefore, make sure to remove the extra sealing agent.
3. Re-use of fittings:
  - 1) Ordinarily, the fitting can be reused 2 to 3 times.
  - 2) Before reusing the fitting, clear off the sealing agent that remains on the removed pipe fitting using an air blower. If the sealing agent is peeled off and enters the peripheral equipment, it can cause air leakage.
  - 3) If the sealing effect has been lost, wrap a seal tape over the sealing agent to reuse the fitting. Do not use any sealing agent other than seal tape.

## One-touch Fitting

### ⚠ Caution

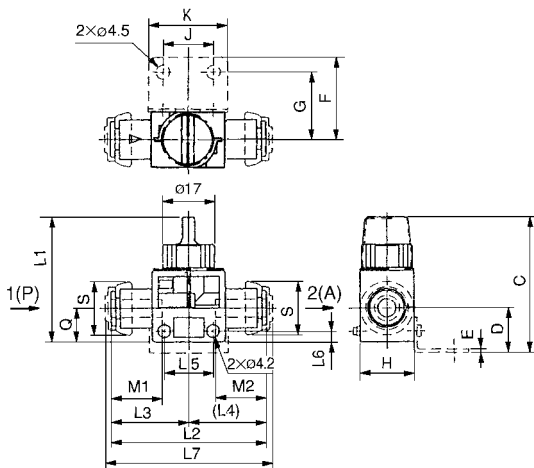
1. When tubing of brands other than SMC's are used, verify that the tubing O.D. satisfies the following accuracy;

- Nylon tubing ..... Within  $\pm 0.1$  mm
- Soft nylon tubing ..... Within  $\pm 0.1$  mm
- Polyurethane tubing ..... Within  $+0.1$  mm,  $-0.2$  mm

If the tube's external accuracy is not satisfied, it may not be possible to connect the tube. Even if it is connected, air leakage or tube disconnection may result.



## Flame Resistant Type: 1(P)/2(A): One-touch Fitting

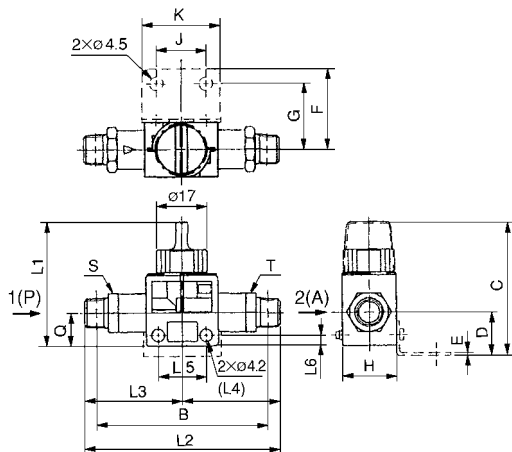


Applicable tubing O. D. (mm)	Model	H	L1	L2	L3	L4	L5	L6	L7	Q	M1	M2	Effective area (mm <sup>2</sup> )		
													1(P)-2(A)	2(A)-3(R)	
4	4	VHK□R-04F-04F	18	41	47.6	23.8	23.8	16.5	3.5	51.6	11	15.8	15.8	3.4	1.2
6	6	VHK□R-06F-06F	18	41	48.6	24.3	24.3	16.5	3.5	52.6	11	16.8	16.8	7.2	1.2
8	8	VHK□R-08F-08F	18	41	52.4	26.2	26.2	16.5	3.5	56.4	11	18.7	18.7	9.7	1.2
10	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	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

Applicable tubing O. D. (mm)	Model	Mass (g)	S	Bracket mounting dimensions								
				Bracket assembly no.	C	D	E	F	G	J	K	
4	4	VHK□R-04F-04F	15	Ø14.4	VHK-B1A	44.5	14.5	1	27	22	16.5	26
6	6	VHK□R-06F-06F	16	Ø16.8	VHK-B1A	44.5	14.5	1	27	22	16.5	26
8	8	VHK□R-08F-08F	17	Ø19.2	VHK-B1A	44.5	14.5	1	27	22	16.5	26
10	10	VHK□R-10F-10F	29	Ø23.3	VHK-B2A	49	17	1	30	25	21.5	31
12	12	VHK□R-12F-12F	32	Ø25.7	VHK-B2A	49	17	1	30	25	21.5	31

## Flame Resistant Type: 1(P)/2(A): Male Thread



\* Reference dimensions after insertion of R thread

Connection thread R	Model	H	L1	L2	L3	L4	L5	L6	Q	B*	Effective area (mm <sup>2</sup> )		Mass (g)	
											1(P)-2(A)	2(A)-3(R)		
1/8	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	1/4	VHK□R-02S-02S	18	41	78	39	39	16.5	3.5	11	66	9.7	1.2	47
3/8	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	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	Model	S (Width across flats)	T (Width across flats)	Bracket mounting dimensions								
				Bracket assembly no.	C	D	E	F	G	J	K	
1/8	1/8	VHK□R-01S-01S	13	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26
1/4	1/4	VHK□R-02S-02S	17	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26
3/8	3/8	VHK□R-03S-03S	19	19	VHK-B2A	49	17	1	30	25	21.5	31
1/2	1/2	VHK□R-04S-04S	22	22	VHK-B2A	49	17	1	30	25	21.5	31

# Series VHK Made to Order

Please contact SMC for detailed specifications, delivery and prices.



## 1 IN/OUT Size: Altered 1/4" Valve X205

**VHK** 2 - 07F - 07F     - **X205**

**Valve model**

2	2 port valve
3	3 port valve

1(P) port size: 1/4"

2(A) port size: 1/4"

**Bracket**

Nil	None
L	With L-bracket

\* Bracket and screws are attached.

**Knob color**

Nil (Standard)	2 port valve	Gray
	3 port valve	Blue
R (Option)	2 port valve	Red
	3 port valve	

IN/OUT size: Altered 1/4" valve

## 2 IN/OUT Size: Altered 5/16" Valve X216

**VHK** 2 - 09F - 09F     - **X216**

**Valve model**

2	2 port valve
3	3 port valve

1(P) port size: 5/16"

2(A) port size: 5/16"

**Bracket**

Nil	None
L	With L-bracket

\* Bracket and screws are attached.

**Knob color**

Nil (Standard)	2 port valve	Gray
	3 port valve	Blue
R (Option)	2 port valve	Red
	3 port valve	

IN/OUT size: Altered 5/16" valve

## 3 IN/OUT Size: Altered 3/8" Valve X209

**VHK** 2 - 11F - 11F     - **X209**

**Valve model**

2	2 port valve
3	3 port valve

1(P) port size: 3/8"

2(A) port size: 3/8"

**Bracket**

Nil	None
L	With L-bracket

\* Bracket and screws are attached.

**Knob color**

Nil (Standard)	2 port valve	Gray
	3 port valve	Blue
R (Option)	2 port valve	Red
	3 port valve	

IN/OUT size: Altered 3/8" valve

VM

VMG

VR

VH