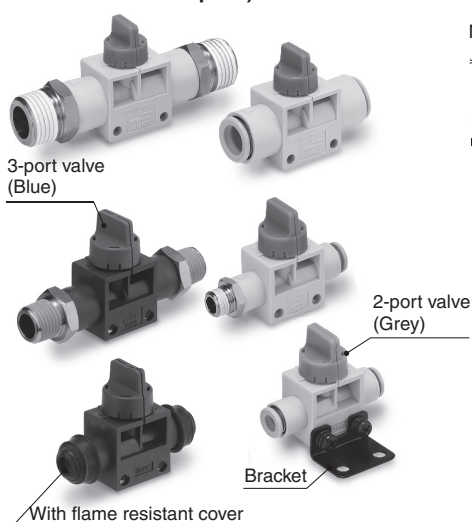


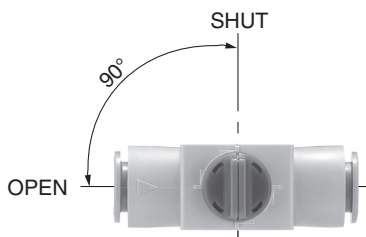
# Finger Valve VHK Series

RoHS

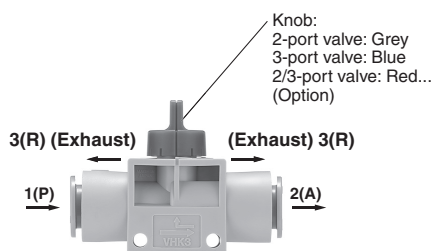
With a function to prevent the nob from coming out  
 Large effective area: 2.0 to 17.5 mm<sup>2</sup>  
 Reduced operating force  
 Poppet valve construction seldom suffers seal deflection.  
 The series begins with the min. tubing O.D. of  $\varnothing 4$ .  
 Selection from four types in accordance 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.)



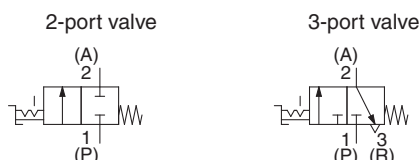
The valve direction clearly indicates whether the valve is open or closed.  
 (SHUT-OPEN: Counterclockwise)



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



## Symbol



## Specifications

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

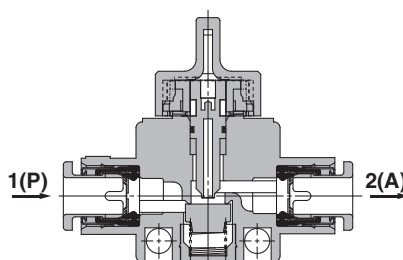
Note 1) Please note that when the valve is used at micro pressures of 0.1 MPa or less, valve leakage may be more than the standard value (5 cm<sup>3</sup>/min).

Note 2) Use caution about the maximum operating pressure when soft nylon or polyurethane tubing is used.

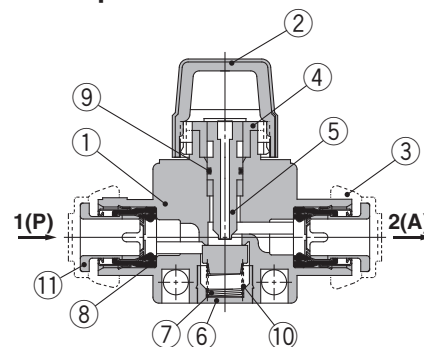
\* Use VHK2 (2-port valve) for vacuum application.

## Construction

### 2-port valve: VHK2A series



### 3-port valve: VHK3A series



## 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	POM
		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)

## Replacement Parts

Description	Model	
	<ul style="list-style-type: none"> <li>One-touch fitting</li> <li>Applicable tubing O.D. <math>\varnothing 8</math> or less</li> </ul>	<ul style="list-style-type: none"> <li>One-touch fitting</li> <li>Applicable tubing O.D. <math>\varnothing 10</math> or more</li> <li>1(P)-Male thread • 2(A)-Male thread</li> <li>Port size R3/8 or more</li> </ul>
Part no.		
Bracket assembly <sup>Note 2)</sup>	VHK-B1A <sup>Note 1)</sup>	VHK-B2A <sup>Note 1)</sup>

Note 1) For details on selection of each bracket assembly part no., refer to the tables on pages 2, 3 and 4.

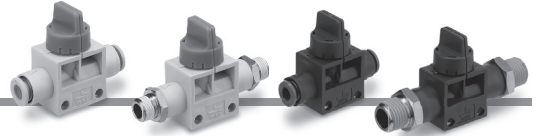
Note 2) The bracket, bolts, nuts, and washers are supplied with the bracket assembly.



EMC-VHK-01Aa-UK

# VHK-A Series

## How to Order



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

**Flame resistant type** VHK **2** A R - **04F** - **04F** [ ] [ ] [ ] **Made to Order**

**Valve model**

2	2-port valve
3	3-port valve

**Flame resistant type**

—	None
C	With cover (For One-touch fitting only)

**1(P) port size**

04F	∅ 4
06F	∅ 6
08F	∅ 8
10F	∅ 10
12F	∅ 12
M5	M5 x 0.8
01S	R1/8
02S	R1/4
03S	R3/8
04S	R1/2

**2(A) port size**

04F	∅ 4
06F	∅ 6
08F	∅ 8
10F	∅ 10
12F	∅ 12
M5	M5 x 0.8
01S	R1/8
02S	R1/4
03S	R3/8
04S	R1/2

**Bracket**

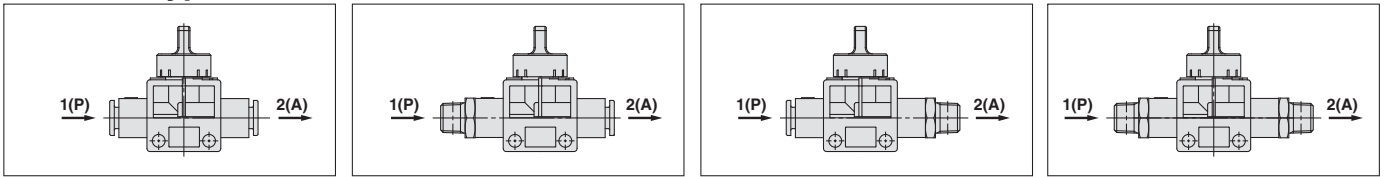
—	None
L	With L-bracket

\* Bracket and screws are attached.

**Knob colour**

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

### Standard Type



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

1(P)	2(A)				
	Applicable tubing O.D. [mm]				
	∅ 4	∅ 6	∅ 8	∅ 10	∅ 12
Applicable tubing O.D. [mm]	∅ 4	●			
	∅ 6	●	●		
	∅ 8		●	●	
	∅ 10			●	●
	∅ 12				●

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

1(P)	2(A)				
	Applicable tubing O.D. [mm]				
	∅ 4	∅ 6	∅ 8	∅ 10	∅ 12
Port size R	M5	●	●		
	1/8	●	●	●	
	1/4		●	●	●
	3/8		●	●	●
	1/2			●	●

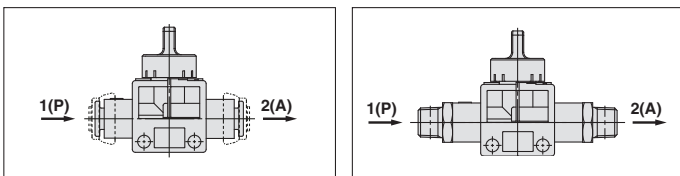
**1(P): One-touch fitting**  
**2(A): Male thread**

1(P)	2(A)					
	Port size R					
	M5	1/8	1/4	3/8	1/2	
Applicable tubing O.D. [mm]	∅ 4	●	●			
	∅ 6	●	●	●	●	
	∅ 8		●	●	●	
	∅ 10			●	●	●
	∅ 12			●	●	●

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

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

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



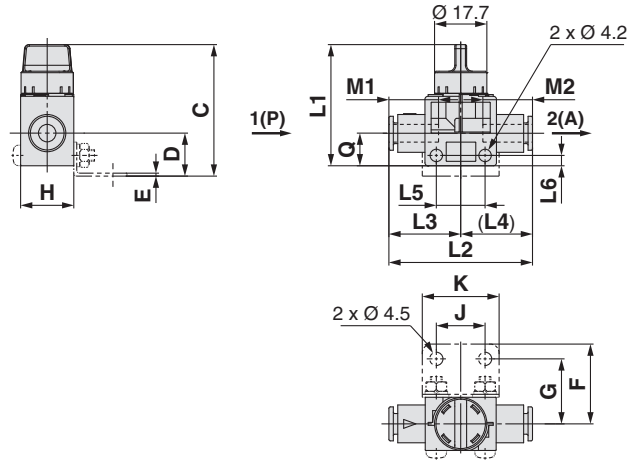
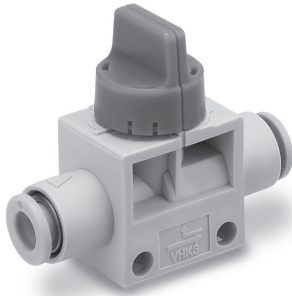
**1(P): One-touch fitting**  
**2(A): One-touch fitting**

1(P)	2(A)				
	Applicable tubing O.D. [mm]				
	∅ 4	∅ 6	∅ 8	∅ 10	∅ 12
Applicable tubing O.D. [mm]	∅ 4	●			
	∅ 6		●		
	∅ 8			●	
	∅ 10				●
	∅ 12				

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

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

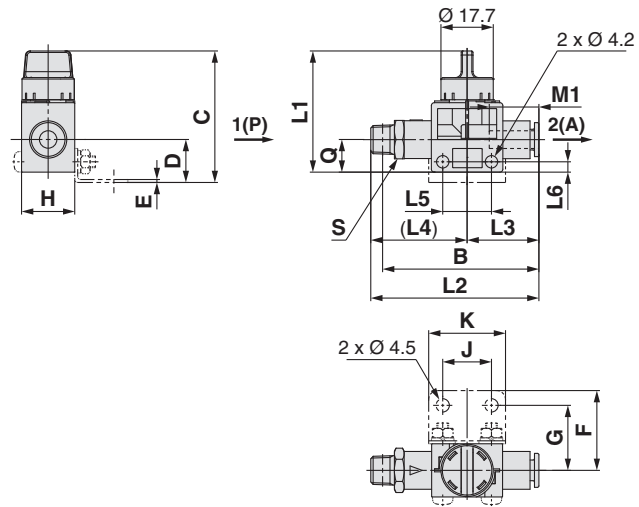
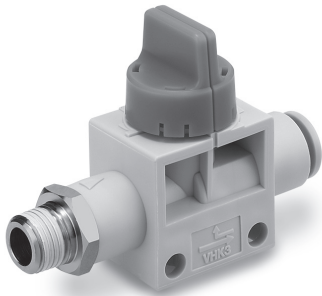
## 1(P)/2(A): One-touch Fitting



Applicable tubing O.D. [mm]		Model	H	L1	L2	L3	L4	L5	L6	M1	M2	Q	Flow rate characteristics						Weight (g)	Bracket mounting dimensions						
1(P)	2(A)												1(P)→2(A)			2(A)→3(R)*1				Bracket assembly no.		C	D	E	F	G
				C <sub>dm³/(s·bar)</sub>		b		Cv		C <sub>dm³/(s·bar)</sub>		b		Cv												
4	4	VHK□A-04F-04F	18	41	47.6	23.8	23.8	16.5	3.5	15.8	15.8	11	0.7		0.14	0.06	0.06	VHK-B1A	44.5	14.5	1	27	22	16.5	26	
6	4	VHK□A-06F-04F			48	24.3	23.7			16.8	15.8		1.0	0.21												
	6	VHK□A-06F-06F			48.5	24.3	24.3			16.8	16.8		1.4	0.35												
8	6	VHK□A-08F-06F			50.5	26.2	24.3			18.7	16.8		2	0.36												
	8	VHK□A-08F-08F	52.4	26.2	26.2	18.7	18.7	1.9	0.39																	
10	8	VHK□A-10F-08F	58.5	30.5	28	20.8	18.7	2.7	0.55	0.67	0.16	VHK-B2A	49	17	1	30	25	21.5	31							
	10	10	VHK□A-10F-10F	61	30.5	30.5	21.5	20.8	3.1											0.65						
12		10	VHK□A-12F-10F	62	31.5	30.5	21.8	20.8	3.3											0.68						
	12	VHK□A-12F-12F	63	31.5	31.5	21.8	21.8	3.4	0.70																	

\*1 3-port valve

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

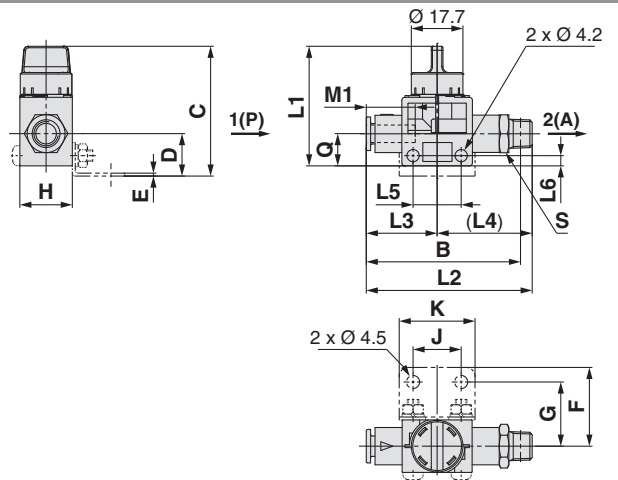
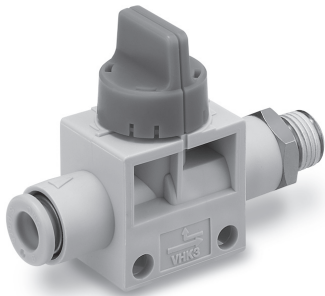


Connection thread R	Applicable tubing O.D. [mm]	Model	H	L1	L2	L3	L4	L5	L6	M1	Q	Flow rate characteristics						Weight (g)	#2 B	S (Width across flat)	Bracket mounting dimensions						
												1(P)→2(A)			2(A)→3(R)*1						Bracket assembly no.		C	D	E	F	G
				C <sub>dm³/(s·bar)</sub>		b		Cv		C <sub>dm³/(s·bar)</sub>		b		Cv													
M5	4	VHK□A-M5-04F	18	41	52.9	23.8	29.1	16.5	3.5	15.8	11	0.4	0.10	0.25	0.06	19	49	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26	
	6	VHK□A-M5-06F			53.9	24.3	29.6			16.8																	0.4
1/8	4	VHK□A-01S-04F	18	41	55.4	23.8	31.6	16.5	3.5	15.8	11	0.7	0.17	0.06	21	51	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	6	VHK□A-01S-06F			56.9	24.3	32.6			16.8																1.4	0.35
1/4	8	VHK□A-01S-08F	18	41	62.2	26.2	36	16.5	3.5	18.7	11	1.9	0.47	0.06	31	58	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	6	VHK□A-02S-06F			60.4	24.3	36.1			16.8																1.4	0.35
3/8	8	VHK□A-02S-08F	18	41	65.2	26.2	39	16.5	3.5	18.7	11	1.9	0.47	0.06	32	59	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	10	VHK□A-02S-10F			73.8	30.5	43.3			20.8																3.1	0.78
1/2	12	VHK□A-02S-12F	18	41	77.3	31.5	44.8	16.5	3.5	21.8	14	3.4	0.85	0.16	63	70	22	VHK-B2A	49	17	1	30	25	21.5	31		
	6	VHK□A-03S-06F			62.4	24.3	38.1			16.8																1.4	0.35
1/2	8	VHK□A-03S-08F	18	41	66.2	26.2	40	16.5	3.5	18.7	11	1.9	0.47	0.06	40	60	17	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	10	VHK□A-03S-10F			74.8	30.5	44.3			20.8																3.1	0.78
1/2	12	VHK□A-03S-12F	18	41	77.3	31.5	45.8	16.5	3.5	21.8	14	3.4	0.85	0.16	64	71	22	VHK-B2A	49	17	1	30	25	21.5	31		
	10	VHK□A-04S-10F			78.2	30.5	47.7			20.8																3.1	0.78
1/2	12	VHK□A-04S-12F	18	41	80.2	31.5	48.7	16.5	3.5	21.8	14	3.4	0.85	0.16	70	72	22	VHK-B1A	49	17	1	30	25	21.5	31		

\*1 3-port valve \*2 Reference dimensions after insertion of R thread.

# VHK-A Series

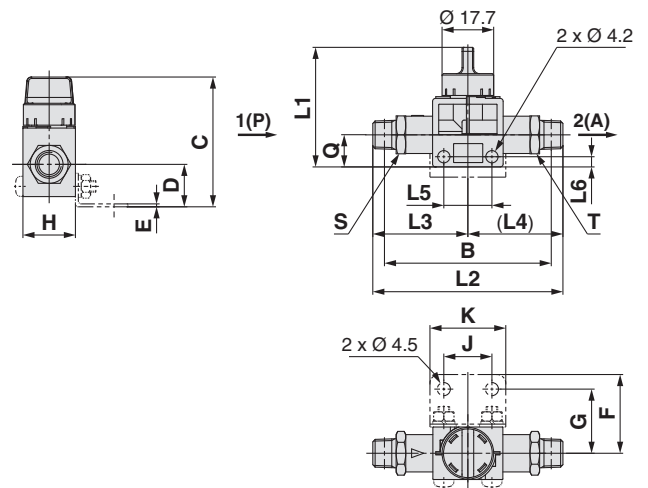
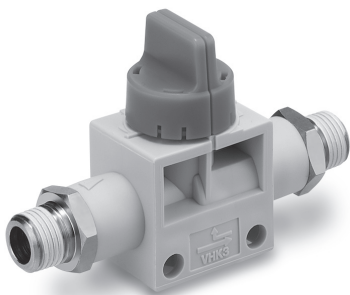
## 1(P): One-touch Fitting, 2(A): Male Thread



Applicable tubing O.D. [mm]	Connection thread R	Model	H	L1	L2	L3	L4	L5	L6	M1	Q	Flow rate characteristics						Weight (g)	*2 B	S (Width across flat)	Bracket mounting dimensions																								
												1(P)→2(A)			2(A)→3(R)*1						Bracket assembly no.	C	D	E	F	G	J	K																	
												$C_{(l/min)(\psi/bar)}$	b	Cv	$C_{(l/min)(\psi/bar)}$	b	Cv																												
4	M5	VHK□A-04F-M5	18	41	52.9	23.8	29.1	31.6	15.8	11	1.4	0.08	0.25	0.08	19	49	11	VHK-B1A	44.5	14.5	27	22	16.5	26																					
	1/8	VHK□A-04F-01S																							0.4	0.08	0.7	0.14	0.4	0.08															
6	M5	VHK□A-06F-M5	18	41	53.9	24.3	29.6	32.6	16.5	3.5	1.4	0.08	0.25	0.08	21	50	13	VHK-B1A	44.5	14.5	27	22	16.5	26																					
	1/8	VHK□A-06F-01S																							0.4	0.08	0.7	0.14	0.4	0.08															
	1/4	VHK□A-06F-02S																							60.4	36.1	62.4	38.1	62.2	36	65.2	26.2	39	66.2	40	49	68	19	VHK-B2A	49	17	30	25	21.5	31
	3/8	VHK□A-06F-03S																							31	56	31	58	32	59	40	60	51	72	63	70	64	71							
1/8	VHK□A-08F-01S	62.2	36	65.2	26.2	39	66.2	40	49	68	51	72	63	70	64	71	70	72																											
1/4	VHK□A-08F-02S	65.2	26.2	39	66.2	40	49	68	51	72	63	70	64	71	70	72																													
8	1/8	VHK□A-08F-01S	22	46	62.2	36	65.2	26.2	39	18.7	1.9	0.15	0.39	0.6	31	59	17	VHK-B1A	44.5	14.5	27	22	16.5	26																					
	1/4	VHK□A-08F-02S																							3.1	0.65	3.4	0.70	49	68	51	72	63	70	64	71	70	72							
10	1/4	VHK□A-10F-02S	22	46	73.8	43.3	74.8	30.5	44.3	20.8	3.1	0.65	0.67	0.21	49	68	19	VHK-B2A	49	17	30	25	21.5	31																					
	3/8	VHK□A-10F-03S																							3.4	0.70	77.3	31.5	45.8	21.8	3.4	0.70	77.3	31.5	45.8	21.8	3.4	0.70	77.3	31.5	45.8	21.8	3.4	0.70	
12	1/4	VHK□A-12F-02S	22	46	76.3	44.8	77.3	31.5	45.8	21.5	4	14	3.4	0.70	63	70	22	VHK-B2A	49	17	30	25	21.5	31																					
	3/8	VHK□A-12F-03S																							3.4	0.70	80.2	48.7	80.2	48.7	21.8	3.4	0.70	80.2	48.7	21.8	3.4	0.70	80.2	48.7	21.8	3.4	0.70		
	1/2	VHK□A-12F-04S			80.2	48.7	80.2	48.7	21.8	3.4	0.70	80.2	48.7	21.8	3.4	0.70	80.2	48.7	21.8	3.4	0.70	80.2	48.7	21.8	3.4	0.70																			

\*1 3-port valve \*2 Reference dimensions after insertion of R thread.

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



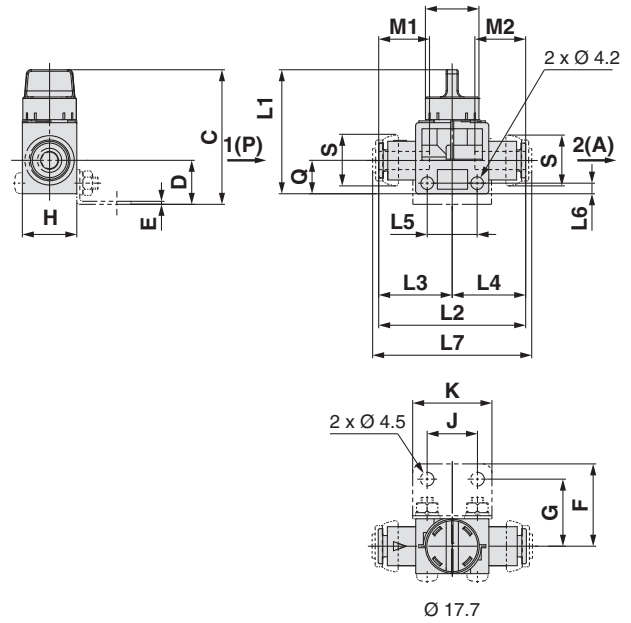
Connection thread R	Model	H	L1	L2	L3	L4	L5	L6	Q	Flow rate characteristics						Weight (g)	*2 B	S (Width across flat)	T (Width across flat)	Bracket mounting dimensions							
										1(P)→2(A)			2(A)→3(R)*1							Bracket assembly no.	C	D	E	F	G	J	K
										$C_{(l/min)(\psi/bar)}$	b	Cv	$C_{(l/min)(\psi/bar)}$	b	Cv												
M5	M5	VHK□A-M5-M5	18	41	58.2	29.1	29.1	32.6	16.5	3.5	11	0.4	0.08	0.25	0.06	23	51	11	VHK-B1A	44.5	14.5	1	27	22	16.5	26	
1/8	M5	VHK□A-01S-M5																									61.6
1/8	1/8	VHK□A-01S-01S	18	41	65.2	32.6	32.6	16.5	3.5	11	1.6	0.35	0.25	0.06	30	57	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26		
	1/4	1/8																								VHK□A-02S-01S	71.6
1/4	1/4	VHK□A-02S-02S	22	46	71.6	39	78	39	21.5	4	14	1.9	0.39	0.6	47	66	17	VHK-B2A	49	17	1	30	25	21.5	31		
	3/8	1/4																								VHK□A-03S-02S	85.1
3/8	3/8	VHK□A-03S-03S	22	46	85.1	44.3	88.6	44.3	21.5	4	14	3.1	0.56	0.67	72	76	19	VHK-B2A	49	17	1	30	25	21.5	31		
	1/2	3/8																								VHK□A-04S-03S	93
1/2	1/2	VHK□A-04S-04S	22	46	93	48.7	97.4	48.7	21.5	4	14	3.4	0.71	0.67	101	81	22	VHK-B2A	49	17	1	30	25	21.5	31		
	1/2	1/2																								VHK□A-04S-04S	97.4

\*1 3-port valve \*2 Reference dimensions after insertion of R thread.

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

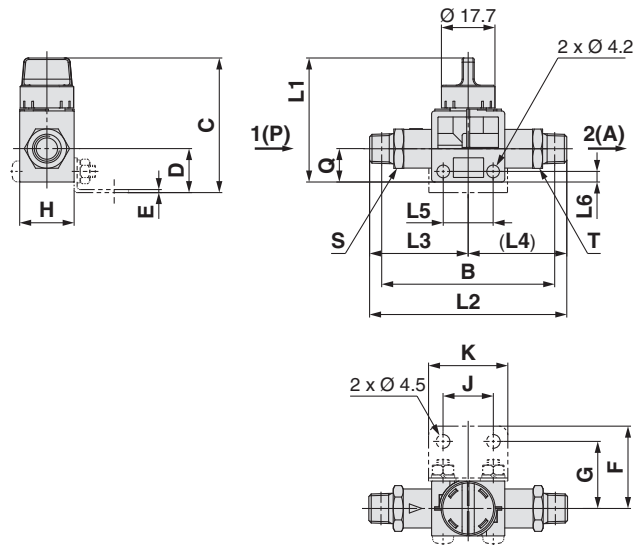
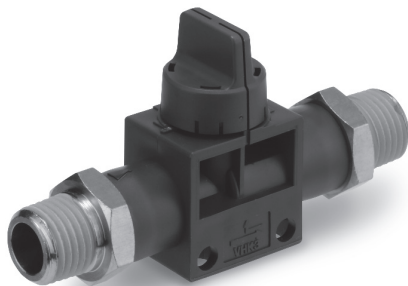


With flame resistant cover



Applicable tubing O. D. (mm)	Model	H	L1	L2	L3	L4	L5	L6	L7	Q	M1	M2	Flow rate characteristics						Weight (g)	S	Bracket mounting dimensions																			
													1(P)→2(A)			2(A)→3(R)					Cv	b	Cv	b	Cv	Bracket assembly no.	C	D	E	F	G	J	K							
1(P)	2(A)	C <sub>1</sub> (m <sup>3</sup> /s·bar <sup>1/2</sup> )	b	Cv	C <sub>2</sub> (m <sup>3</sup> /s·bar <sup>1/2</sup> )	b	Cv																																	
4	4	VHK□AR-04F-04F	18	41	47.6	23.8	28.8	16.5	3.5	51.6	11	15.8	15.8	0.4	0.14	0.35	0.25	0.6	0.08	15	Ø 14.4	VHK-B1A	44.5	14.5	1	27	22	16.5	26											
6	6	VHK□AR-06F-06F			48.6	24.3	24.3																							52.4	26.2	26.2	56.4	18.7	18.7	1.9	0.39	0.21	16	Ø 16.8
8	8	VHK□AR-08F-08F			52.4	26.2	26.2																							61	30.5	30.5	65	20.8	20.8	3.1	0.65	0.21	17	Ø 19.2
10	10	VHK□AR-10F-10F	22	46	61	30.5	30.5	21.5	4	65	4	20.8	20.8	3.1	0.65	0.67	0.21	29	Ø 23.3	VHK-B2A	49	17	1	30	25	21.5	31													
12	12	VHK□AR-12F-12F			63	31.5	31.5																					67	21.8	21.8	3.4	0.70	0.67	0.21	32	Ø 25.7				

## 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*	Flow rate characteristics						Weight (g)	S (Width across flat)	T (Width across flat)	Bracket mounting dimensions													
											1(P)→2(A)			2(A)→3(R)						Cv	b	Cv	b	Cv	Bracket assembly no.	C	D	E	F	G	J	K	
1(P)	2(A)	C <sub>1</sub> (m <sup>3</sup> /s·bar <sup>1/2</sup> )	b	Cv	C <sub>2</sub> (m <sup>3</sup> /s·bar <sup>1/2</sup> )	b	Cv																										
1/8	1/8	VHK□AR-01S-01S	18	41	65.2	32.6	32.6	16.5	3.5	11	57	1.6	0.35	0.25	0.08	30	13	13	VHK-B1A	44.5	14.5	1	27	22	16.5	26							
1/4	1/4	VHK□AR-02S-02S			78	39	39																				66	1.9	0.39	0.21	47	17	17
3/8	3/8	VHK□AR-03S-03S			88.6	44.3	44.3																				76	3.1	0.66	0.21	72	19	19
1/2	1/2	VHK□AR-04S-04S	97.4	48.7	48.7	81	3.7	0.71	0.67	101	22	22	VHK-B2A	49	17	1	30	25	21.5	31													



# VHK-A Series Made to Order

Please contact SMC for detailed dimensions, specifications, and lead times.



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

**VHK 2 A-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"

**Knob colour**

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

**Bracket**

—	None
L	With L-bracket

\* Bracket and screws are attached.

IN/OUT size: Altered 1/4" valve

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

**VHK 2 A-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"

**Knob colour**

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

**Bracket**

—	None
L	With L-bracket

\* Bracket and screws are attached.

IN/OUT size: Altered 5/16" valve

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

**VHK 2 A-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"

**Knob colour**

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

**Bracket**

—	None
L	With L-bracket

\* Bracket and screws are attached.

IN/OUT size: Altered 3/8" valve

## 4 IN/OUT Size: Altered 1/2" Valve X247

**VHK 2 A-13F-13F [ ] [ ] - X247**

**Valve model**

2	2-port valve
3	3-port valve

1(P) port size: 1/2"

2(A) port size: 1/2"

**Knob colour**

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

**Bracket**

—	None
L	With L-bracket

\* Bracket and screws are attached.

IN/OUT size: Altered 1/2" valve



# VHK-A Series Specific Product Precautions

Be sure to read this before handling the products.

## 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.

## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>1)</sup>, and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.  
ISO 4413: Hydraulic fluid power – General rules relating to systems.  
IEC 60204-1: Safety of machinery – Electrical equipment of machines.  
(Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots - Safety.  
etc.

## Warning

### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

## Caution

### 1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.<sup>2)</sup> Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
  2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
  3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.
- 2) Vacuum pads are excluded from this 1 year warranty.  
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Caution

### SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.



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