

Valve for Water and Chemical-based Fluids (2/3 Port Air Operated Valve)

Applicable for 2 types of liquid paint (VCC12D)

- PTFE diaphragm structure = Sliding part eliminated
- Less paint adhesion

Mountable on a robot arm (space-saving, lightweight)

- 2 valves per station (30 mm pitch)
- 2/3 port valves mixed mounting
- Resin manifold block



- 2 port ... 6 valves
- 3 port ... 6 valves
- Fitting ... 19 pcs.

SUS316L Stainless steel fitting

Series VCK / $\phi 6$ to $\phi 12$



2 port valve

VCC12(D)



3 port valve

VCC13



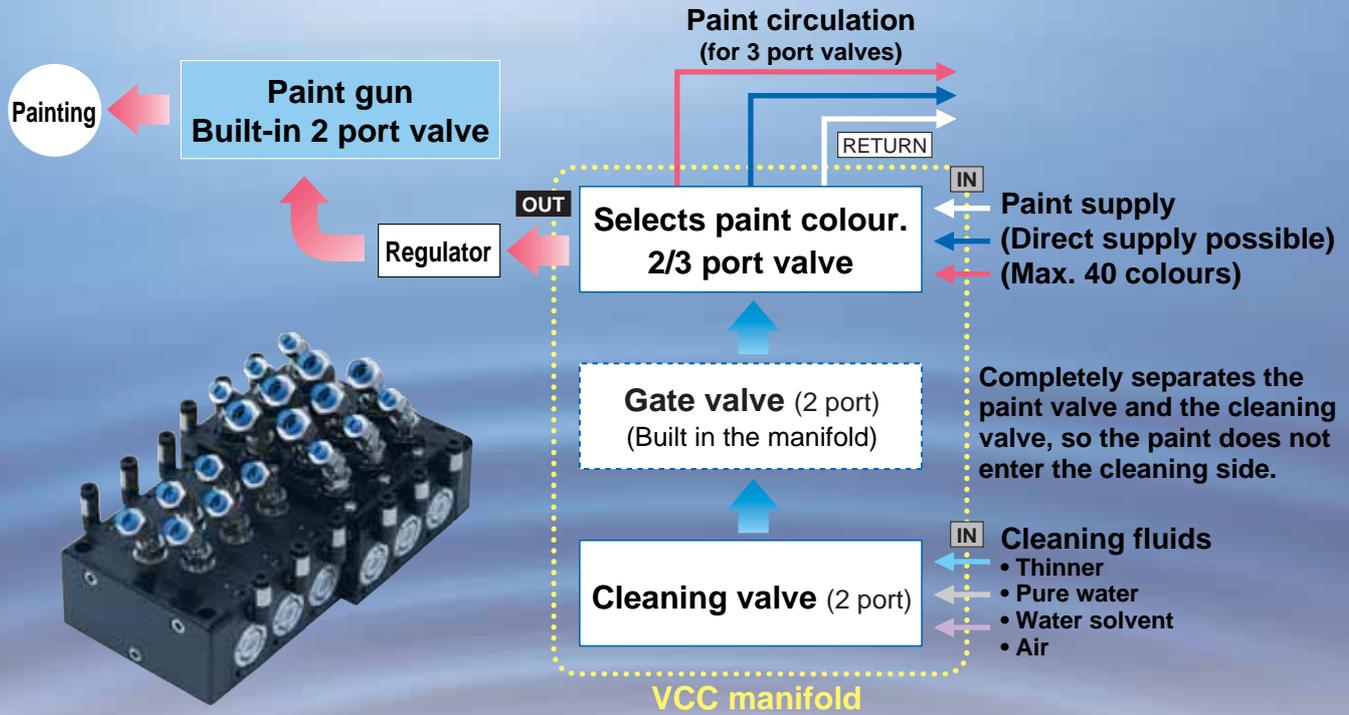
Series VCC



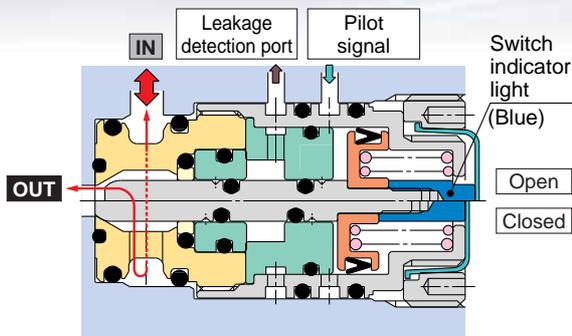
Paint Line System

(Application example)

Water/Chemical-based Paint, Pure Water, Cleaning Solvent type



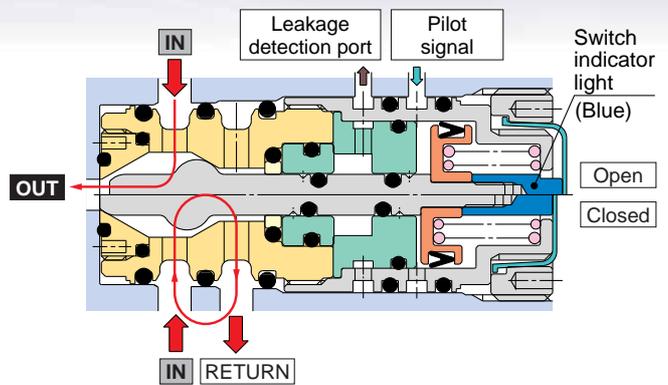
2 port valve (VCC12)



Leakage detection port

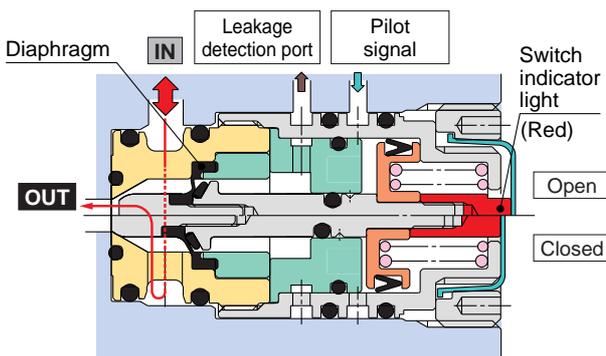
Paint leakage to the pilot piping can be checked visually. Even when leakage occurs, there is no backflow between the paint and pneumatics.

3 port valve (VCC13)



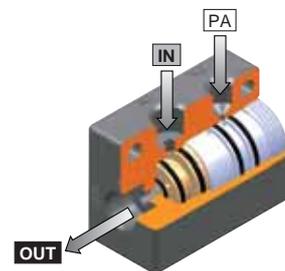
2 types of Liquid Paint/PTFE Diaphragm

PAT.

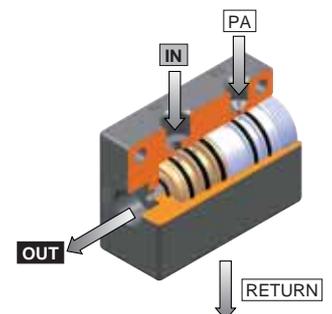


Single Paint, Solvent, Ink Control type/Single Unit

2 port valve (VCC12(D))



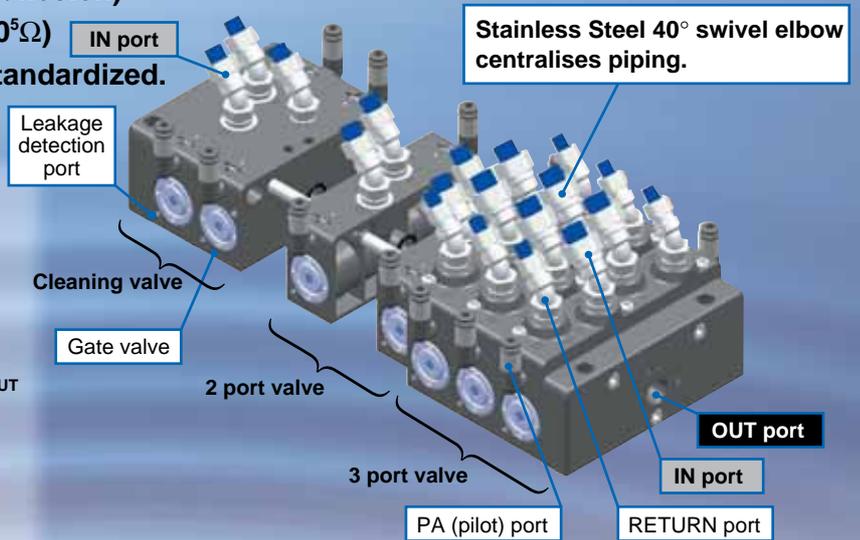
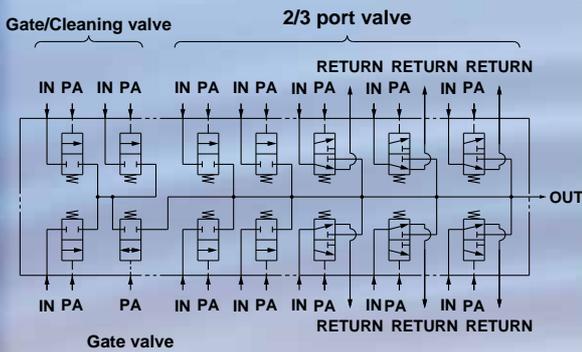
3 port valve (VCC13)



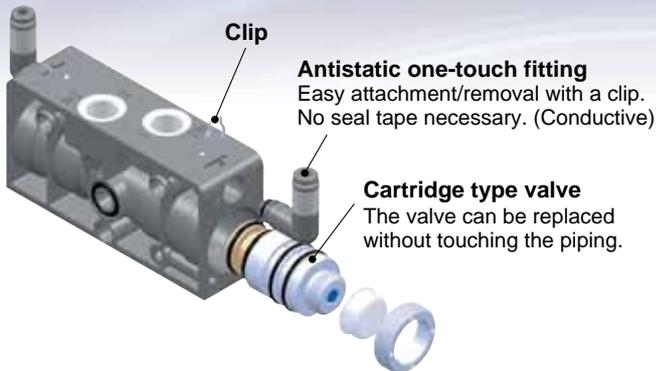
Manifold Valve

Separable Resin Manifold Block

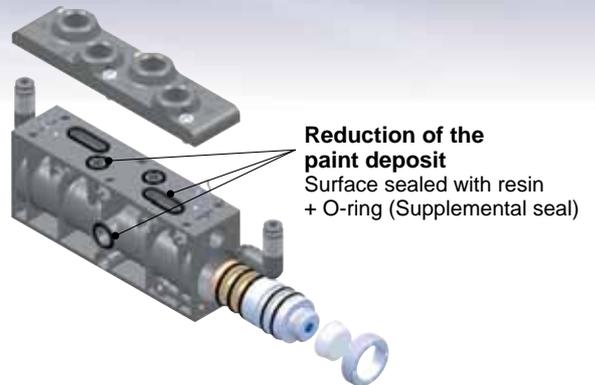
- Easy addition and reduction of stations
- Tough PPS (Polyphenylene Sulfide) resin is used.
- Fluororesin is contained. (Less fluid adhesion)
- Antistatic (Surface resistance 10^2 to $10^5 \Omega$)
- SUS316L Stainless steel fittings are standardized.



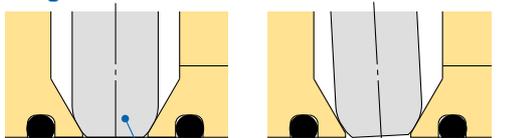
2 port valve manifold block assembly



3 port valve manifold block assembly



Less build-up of liquid → Better cleaning performance, mixing of the colours reduction
 Liquid build-up at valve is **0.01 cc** or less.
Ensures stable sealing performance in case of misalignment.



PAT.

Special fluororesin seal

Even if the sphere is worn out, The O-ring back-up ensures sealing performance.

Indicator function

Operating condition can be checked visually or by touching.

Indicator color
 Blue ... **VCC12, 13**
 Red ... **VCC12D**

Standard (Sliding type)



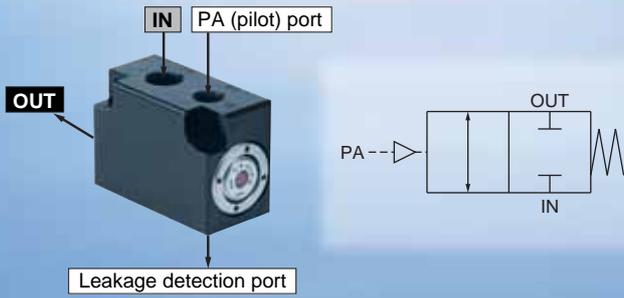
Diaphragm type



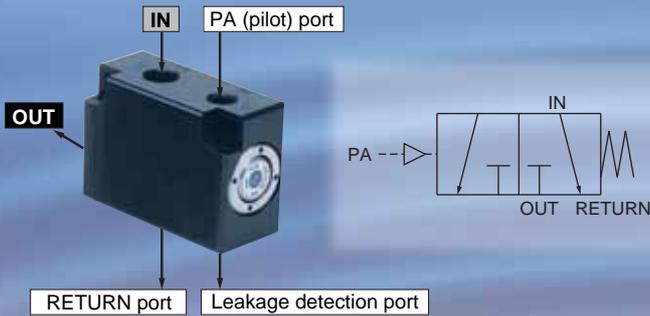
Features 2

Single Unit

• 2 port valve



• 3 port valve



SUS316L Stainless Steel Fitting

VCKH



Male connector

VCKK



40° swivel elbow

VCKL



90° swivel elbow

- 40° swivel elbow is added in line-up.
- Seal tape is unnecessary. No chance for insulation. (Applicable for paint with high voltage)
- Attachment/removal in a narrow space is easy.

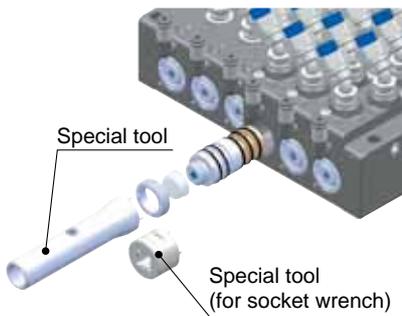
Type	Model	Port size	Applicable tubing O.D. x I.D.
Male connector	VCKH	G1/4	6 x 4 8 x 6
40° swivel elbow	VCKK		10 x 8
90° swivel elbow	VCKL		10 x 7.5 12 x 9

Special Tools

Disassembly and maintenance are possible.

Product design takes maintenance performance into consideration.

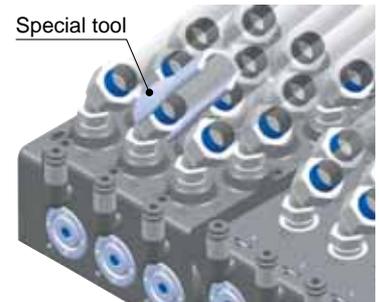
Attaching/Detaching the valve



Disassembling/Cleaning the valve element



Attaching/Detaching the tubing

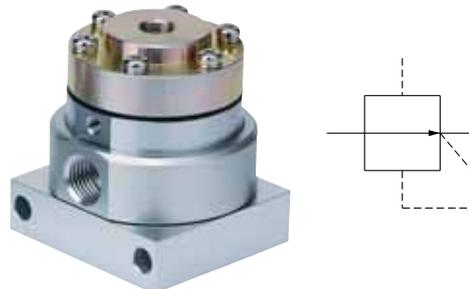


Made to Order

Check valve



Regulator



Note) Also applicable to special manifold.

Valve for Water and Chemical Base Fluids

(2/3 Port Air Operated Valve)

Series VCC

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Valve for Water and Chemical-base Fluids (2/3 Port Air Operated Valve)

Series VCC



Please refer to "Manifold Specification Sheet" in the back of page 6.

How to Order

Valve

VCC1 **2** - **00**

Passage number

2	2 port valve
3	3 port valve
2D	2 port/Diaphragm type (Applicable for 2 liquid paint)

Port size

00	For manifold mounting
02	Rc1/4 (for single unit) <small>Note</small>
02F	G1/4 (for single unit) <small>Note</small>

Note) Part number for sub-base
For 2 port: VCC12-S-⁰²[Rc1/4]_{02F}[G1/4]
For 3 port: VCC13-S-⁰²[Rc1/4]_{02F}[G1/4]



VCC12(D)-00



VCC13-00



VCC12(D)-02(F)



VCC13-02(F)

Manifold

Standard

VV **M** CC1- **06** **06** **C4**

Type (Passage number)

2	2 port valve, Cleaning valve
3	3 port valve
M	2/3 port valves mixed mounting

Pilot port fitting size

C4	ø4 one-touch fitting (Antistatic)
C6	ø6 one-touch fitting (Antistatic)

2 port valve mountable number

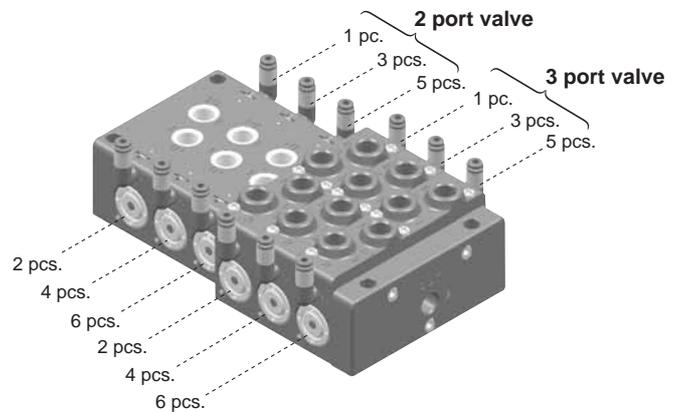
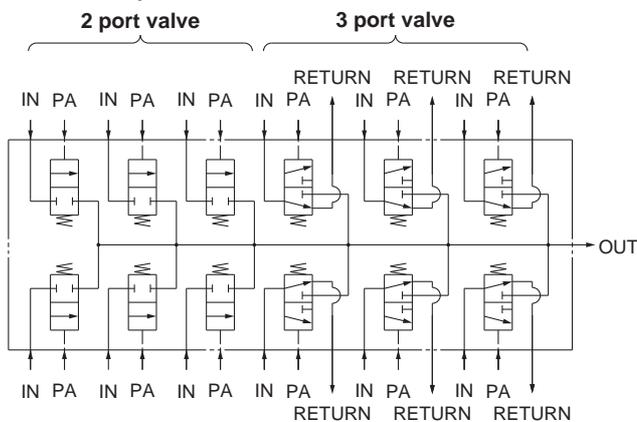
00	No 2 port valves used
02	2 pcs. (colours)
04	4 pcs. (colours)
⋮	⋮

3 port valve mountable number

00	No 3 port valves used
02	2 pcs. (colours)
04	4 pcs. (colours)
⋮	⋮

Note) Maximum mountable valve number: 40 pcs.
(total of 2 port and 3 port valves)

Circuit example



How to Order

Manifold

With gate valve **VV M CC1-06 06 C4-G 04**

Passage number

2	2 port valve, Cleaning valve
M	2/3 port valves mixed mounting

2 port valve mountable number

00	No 2 port valves used
02	2 pcs. (colours)
04	4 pcs. (colours)
⋮	⋮

3 port valve mountable number

00	No 3 port valves used
02	2 pcs. (colours)
04	4 pcs. (colours)
⋮	⋮

Note) Maximum mountable valve number: 40 pcs. (total of 2 port, 3 port and gate valves)

Gate valve and cleaning valve mountable number

02	Cleaning valve (2 port valve): 1 pc. + Gate valve: 1 pc.
04	Cleaning valve (2 port valve): 3 pcs. + Gate valve: 1 pc.
06	Cleaning valve (2 port valve): 5 pcs. + Gate valve: 1 pc.

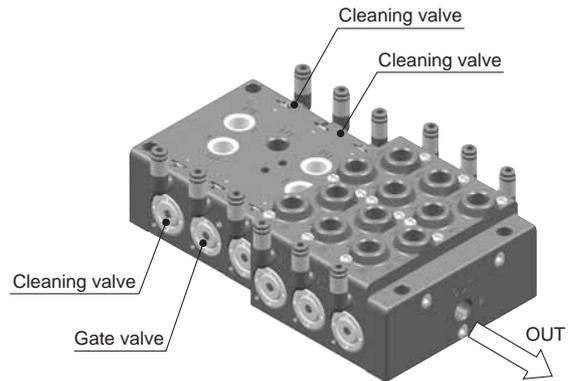
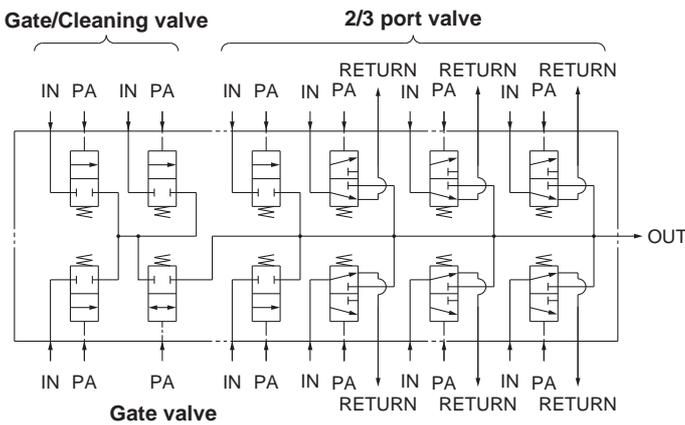
Pilot port fitting size

C4	ø4 one-touch fitting (Antistatic)
C6	ø6 one-touch fitting (Antistatic)

* The gate valve and cleaning valve (2 port valve) are not included. They are ordered separately. (Gate valve is equivalent to 2 port valve.)

* When cleaning valve number is an even number, use the

Circuit example



SUS316L Stainless steel fitting

VCK K 0604 - 02F

Shape

H	Male connector
K	40 swivel elbow
L	90 swivel elbow

Port size

02F	G1/4
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* G1/4 bottom seal has a special shape. Please refer to page 7 for details.

Applicable tubing (O.D. x I.D.)

0604	6 x 4
0806	8 x 6
1075	10 x 7.5
1008	10 x 8
1209	12 x 9



VCKH
Male connector



VCKK
40 swivel elbow



VCKL
90 swivel elbow

Option

Blanking Plug Assembly

Type	Model	Description	Qty.
For a 2 port valve	VVCC12-10A-1	Blanking plug (with O-ring)	1
		Hexagon socket head plug (R1/4)	1
For a 3 port valve	VVCC13-10A-1	Blanking plug (with O-ring)	1
		Hexagon socket head plug (R1/4)	2



Series VCC

Specifications

Model	VCC12	VCC13	VCC12D
Passage number	2 port	3 port	2 port (Diaphragm type)
Construction (Fluid contact material)	Poppet seal (PEEK resin + Stainless steel) + Special fluororesin sliding part		Poppet seal (PEEK resin + Stainless steel) + Special fluororesin diaphragm
Fluid	Water/Chemical-based paint, Ink, Cleaning solvent (Water, Butyl acetate), Air		
Operating pressure range (MPa)	0 to 1.0 (Instantaneous pulsation pressure: 1.2)		0 to 0.7 (Instantaneous pulsation pressure: 0.9)
Withstand pressure (MPa)	2		1.5
Pilot pressure (MPa)	0.4 to 0.7		
Orifice size (mm)	ø3.8		
Effective area (mm ²)	6		
Fluid temperature (°C)	5 to 50		
Ambient temperature (°C)	5 to 50		
Explosion proof construction	Not possible (Default lubricant: White vaseline)		
Mounting orientation	Unrestricted		
Valve leakage (cm ³ /min)	1 or less (3 port valve IN → RETURN: 20 or less) ^{Note 1)}		1 or less ^{Note 2)}

Note 1) Supply pressure: Valve leakage at 1.2 MPa (for air)

Note 2) Supply pressure: Valve leakage at 0.9 MPa (for air)

SUS316L Stainless Steel Fitting Specifications

Applicable tubing	Nylon/Fluoro tubing
Fluid	Water/Chemical-based paint, Ink, Cleaning solvent (Water, Butyl acetate), Air
Max. operating pressure (at 20°C) (MPa)	1.0
Ambient and fluid temperature (°C)	0 to 60°C

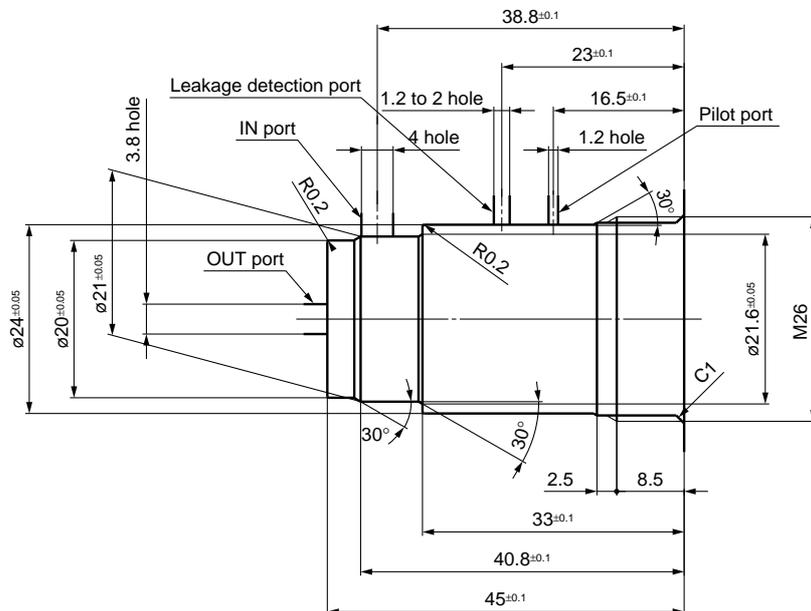
Weight

Valve	VCC12 (2 port)	37 g	
	VCC13 (3 port)	48 g	
Blanking plug assembly	For 2 port	29 g	
	For 3 port	45 g	
Manifold block * Valves are not attached.	For 2 port (2 stations, one-piece style)	150 g	
	For 3 port (2 stations, one-piece style)	254 g	
	For gate valve	300 g	
End plate	For 2 port	409 g	
	For 3 port	495 g	
	For 2/3 port mixed mounting	452 g	
Fitting	VCKH	ø6	24 g
		ø8	25 g
		ø10	33 g
		ø12	36 g
	VCKK	ø6	25 g
		ø8	26 g
		ø10	32 g
		ø12	37 g
	VCKL	ø6	29 g
		ø8	30 g
		ø10	37 g
		ø12	41 g

Dimensions

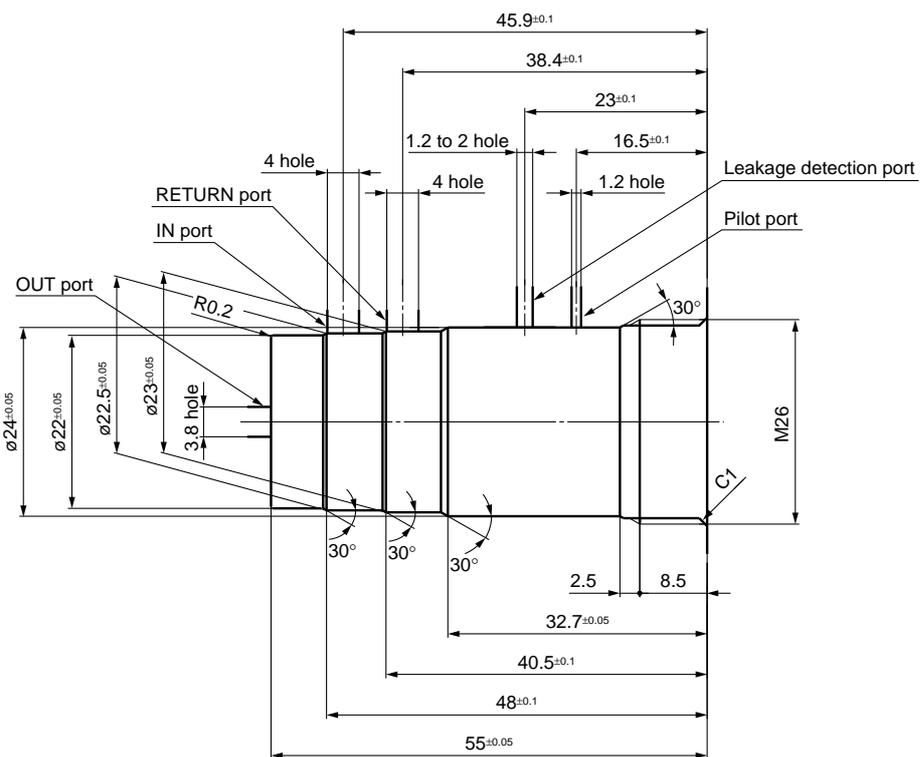
Mounting hole dimensions (When the valve is built into the device.)

VCC12(D)-00



* The recommended insertion surface roughness is Rz6.3.

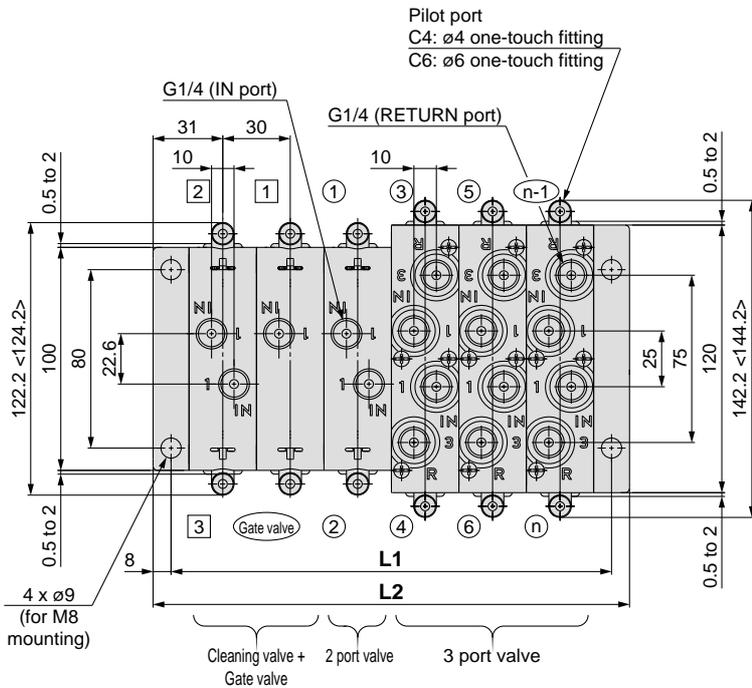
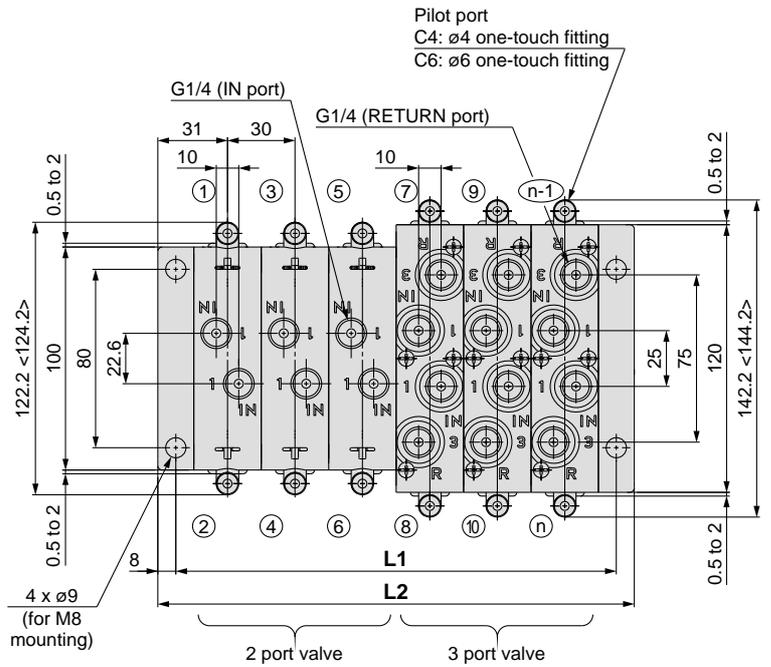
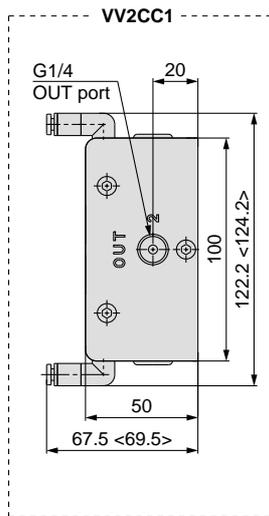
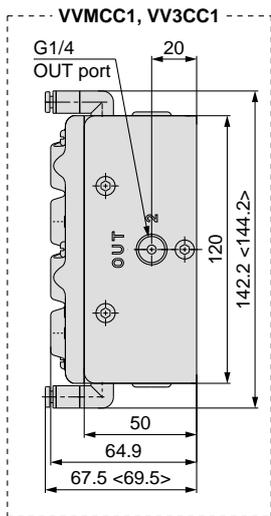
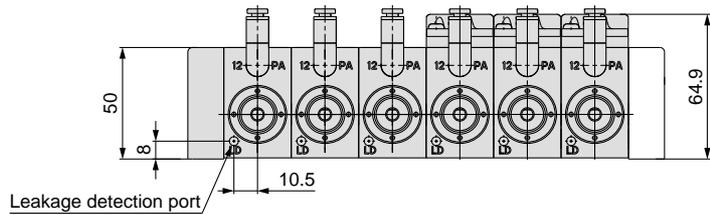
VCC13-00



* The recommended insertion surface roughness is Rz6.3.

Dimensions

Manifold



< >: Pilot port is C6.

$$L1 = n / 2 \times 30 + 16 \quad L2 = n / 2 \times 30 + 32$$

* n = Number of valves (cleaning valve + gate valve + other valves)

n: Stations (mm)

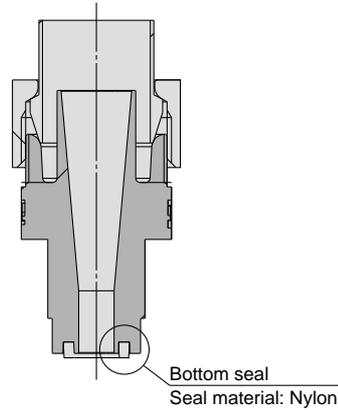
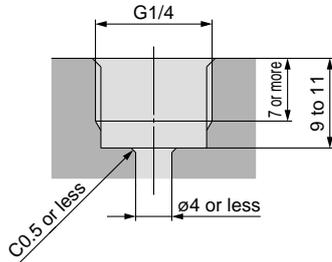
n	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
L1	46	76	106	136	166	196	226	256	286	316	346	376	406	436	466	496	526	556	586	616
L2	62	92	122	152	182	212	242	272	302	332	362	392	422	452	482	512	542	572	602	632

Series VCC

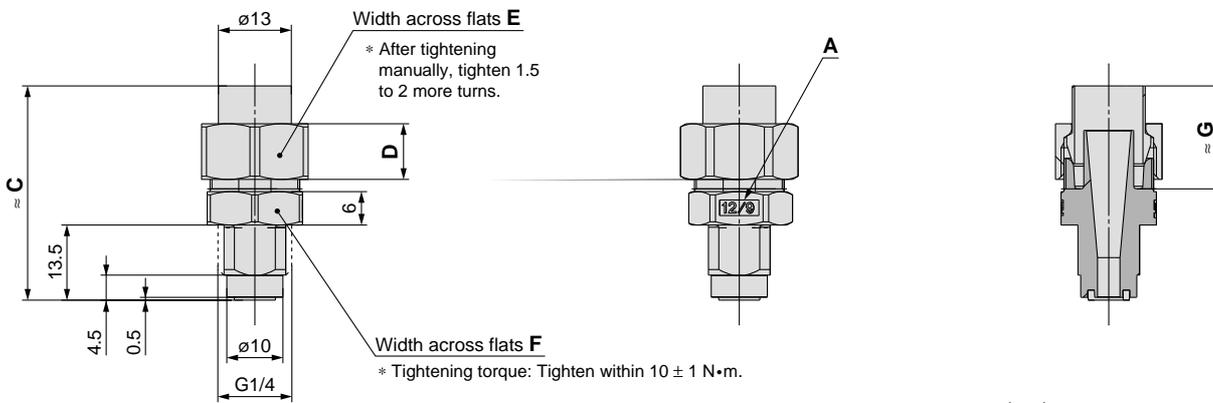
Dimensions

SUS316L Stainless steel fitting

Mounting female thread recommended dimensions



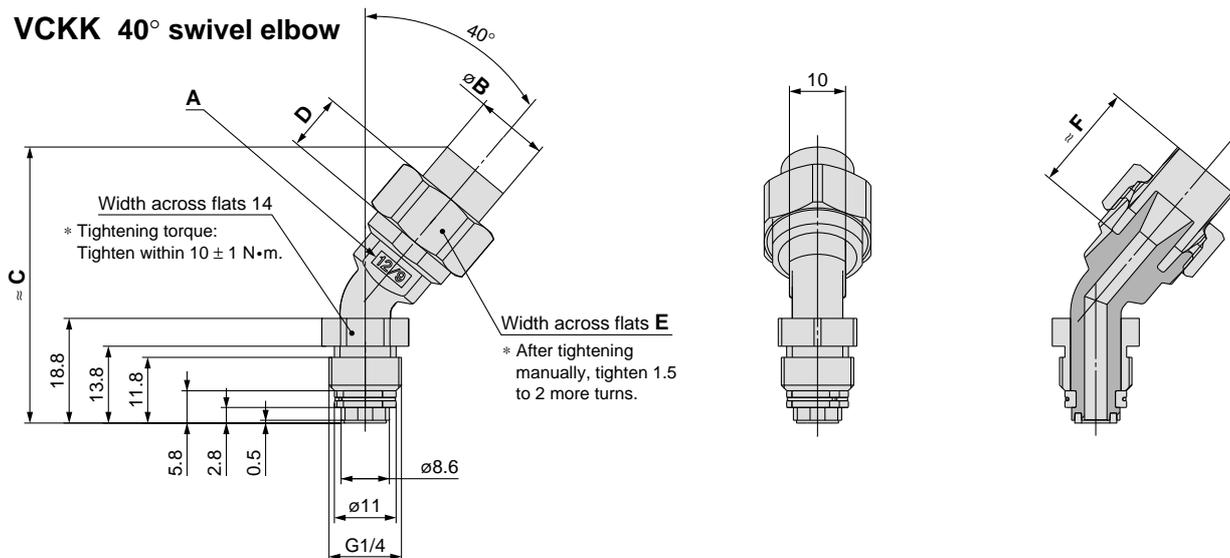
VCKH Male connector



Part no.	Indication of A	øB	C	D	E	F	G
VCKH1209-02F	12/9	13	38.5	10	19	17	18.5
VCKH1008-02F	10/8	11	38	9	17	17	18.5
VCKH1075-02F	10·75	11	38	9	17	17	18.5
VCKH0806-02F	8/4	9	36.5	8	14	14	16
VCKH0604-02F	6/4	7	36.5	8	12	14	15

(mm)

VCKK 40° swivel elbow

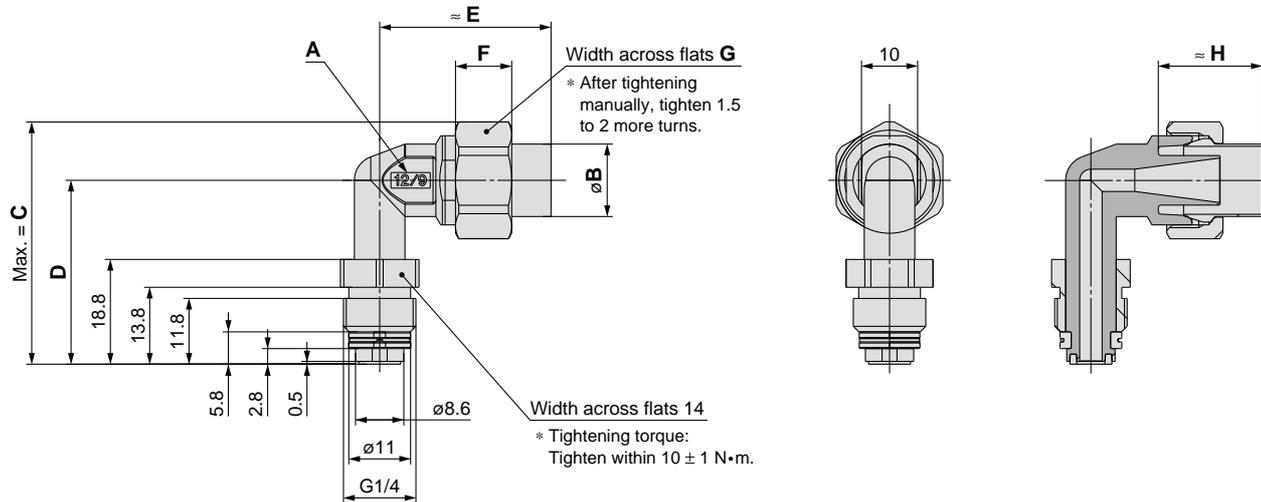


Part no.	Indication of A	øB	C	D	E	F
VCKK1209-02F	12/9	13	49.5	10	19	18.5
VCKK1008-02F	10/8	11	48.5	9	17	18.5
VCKK1075-02F	10·75	11	48.5	9	17	18.5
VCKK0806-02F	8/4	9	46	8	14	16
VCKK0604-02F	6/4	7	45.5	8	12	15

(mm)

Dimensions

VCKL 90° swivel elbow

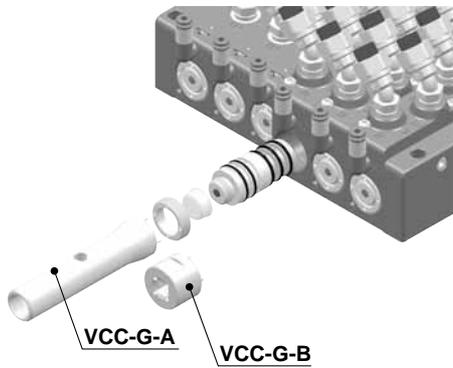


(mm)

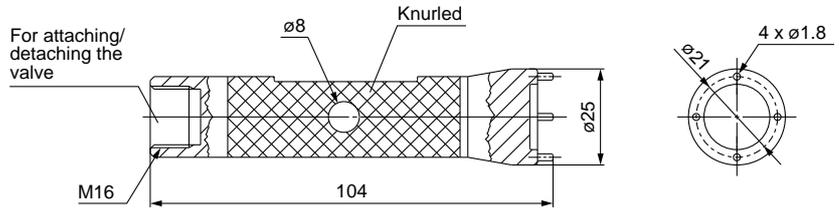
Part no.	Indication of A	øB	C	D	E	F	G	H
VCKL1209-02F	12/9	13	43.5	33	30.5	10	19	18.5
VCKL1008-02F	10/8	11	42.5	33	30	9	17	18.5
VCKL1075-02F	10-75	11	42.5	33	30	9	17	18.5
VCKL0806-02F	8/4	9	40	32	27.5	8	14	16
VCKL0604-02F	6/4	7	38.5	32	27.5	8	12	16

Special Tools

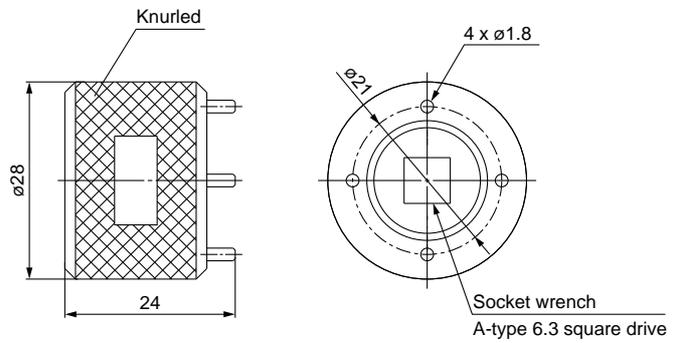
Tool for Attaching/Detaching the Valve



VCC-G-A



VCC-G-B (for socket wrench)

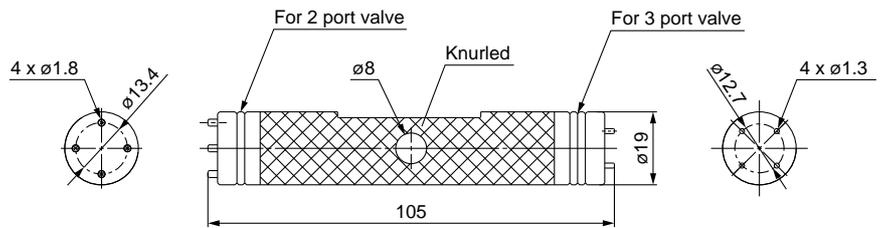


Tool for Disassembling/Cleaning the Valve Element

VCC12(D) 2 port valve



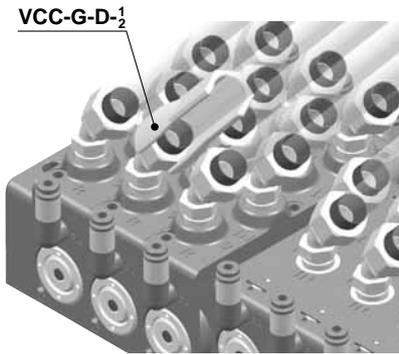
VCC-G-C



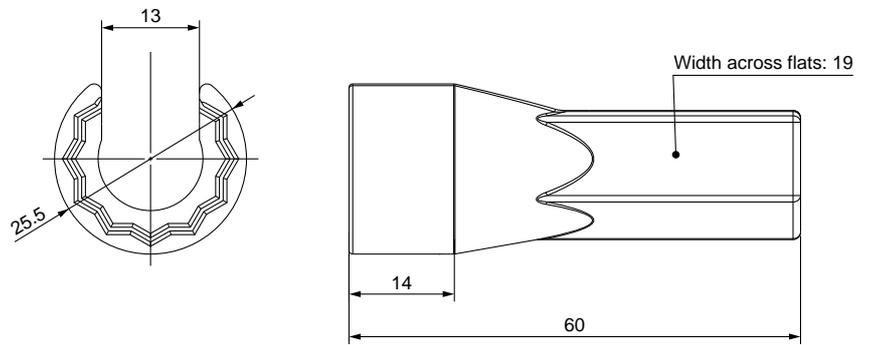
VCC13 3 port valve



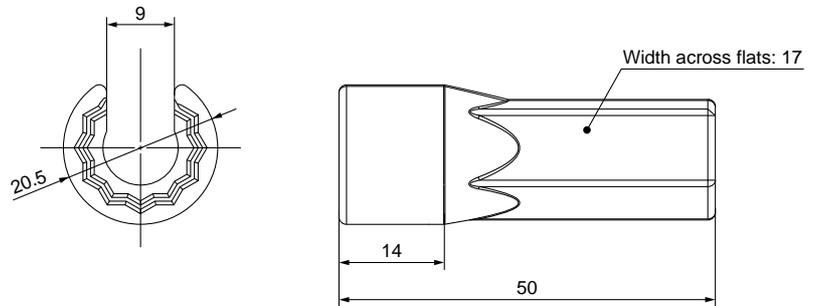
Union Nut Socket



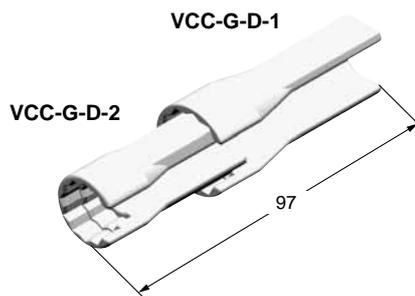
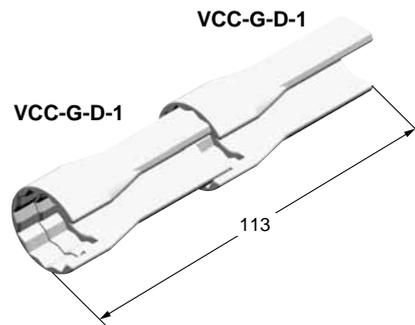
VCC-G-D-1 (Applicable fitting VCK□¹²⁰⁹₁₀₀₈¹⁰⁷⁵)



VCC-G-D-2 (Applicable fitting VCK□⁰⁸⁰⁶₀₆₀₄₎



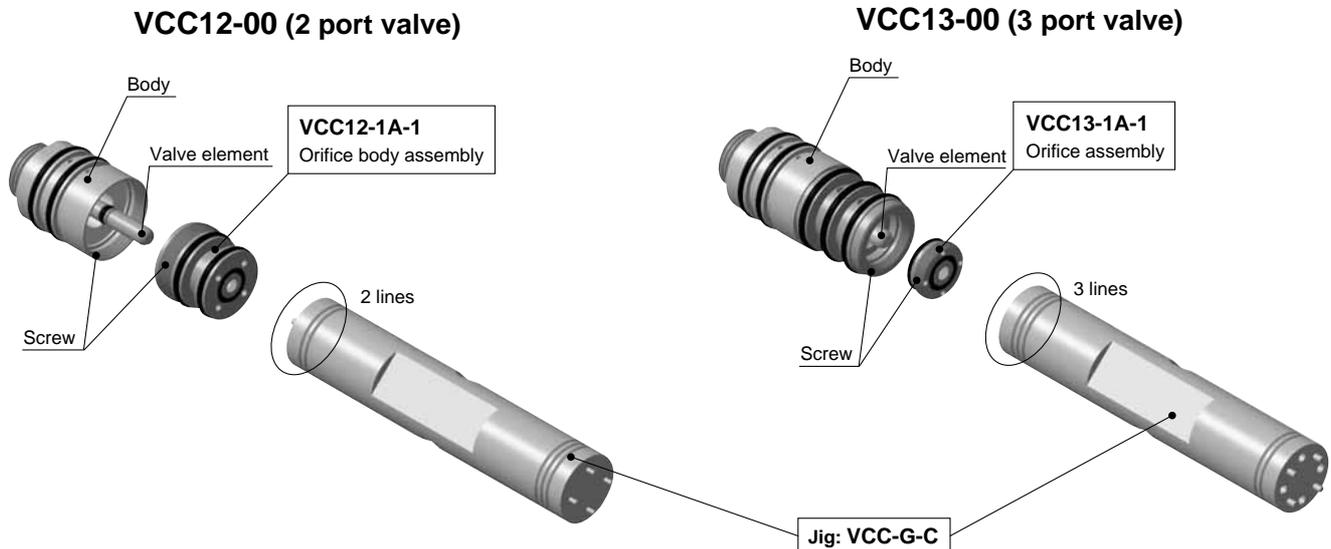
For extending the socket



Disassembly/Assembly/ Maintenance Procedure

Cleaning Valve Element

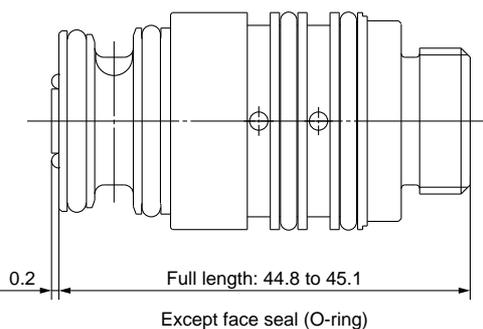
Special tool part no.: VCC-G-C



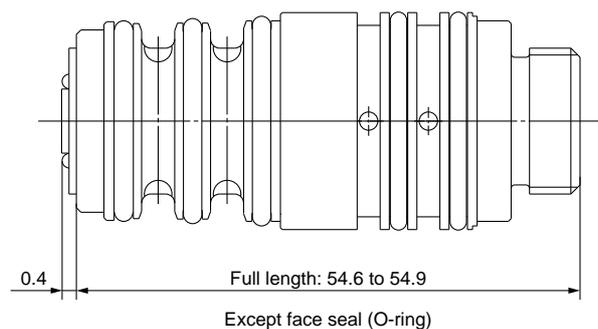
Procedure

- ① Loosen the orifice body with a tool and remove it.
- ② Clean the valve.
- ③ Assemble a new orifice body.

VCC12(D)-00 (2 port valve)



VCC13-00 (3 port valve)



Tighten the screw until it hits the body by pressing the orifice body with approx. 100 to 200 N of force.

(* Additional tightening is not necessary.)

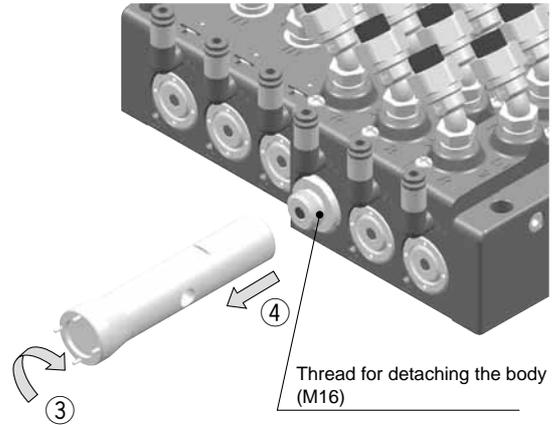
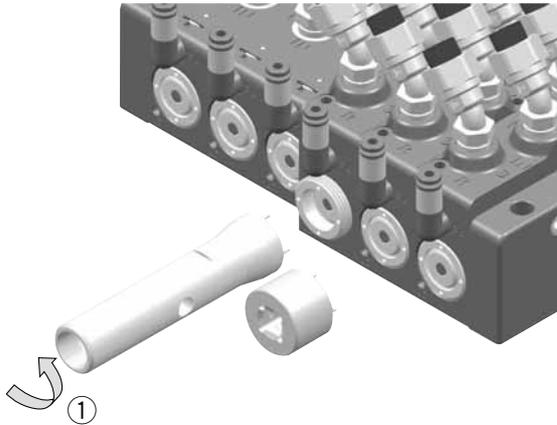
Control dimension with full length. (2 port valve: 44.8 to 45.1 mm, 3 port valve: 54.6 to 54.9 mm)

Reference tightening torque is approx. 1 to 2 N·m for VCC12(D)-00 (2 port valve), and 0.5 to 1 N·m for VCC13-00 (3 port valve).

There is a possibility of damaging threads if tightening exceeds the tightening torque range.

How to Remove the Valve

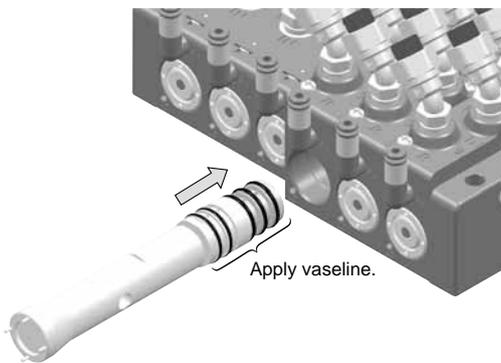
Special tool part no.: VCC-G-A, VCC-G-B (Refer to page 9.)



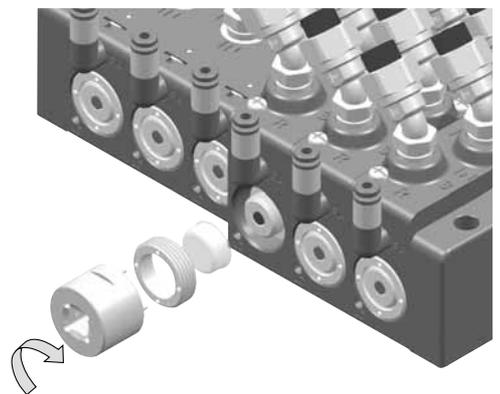
Procedure

- ① Loosen the mounting nut.
- ② Remove the indicator lamp cover.
- ③ Turn 45 to 90° (idle turn) clockwise with a tool (to avoid O-ring adhesion).
- ④ Pull out the valve straight.
- ⑤ Wipe off residual paint on the inner surface of the base with a cleaning material.
- ⑥ Replace the O-ring mounted to the valve. (O-ring part number: See page 13.)

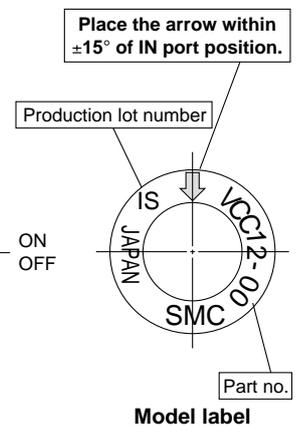
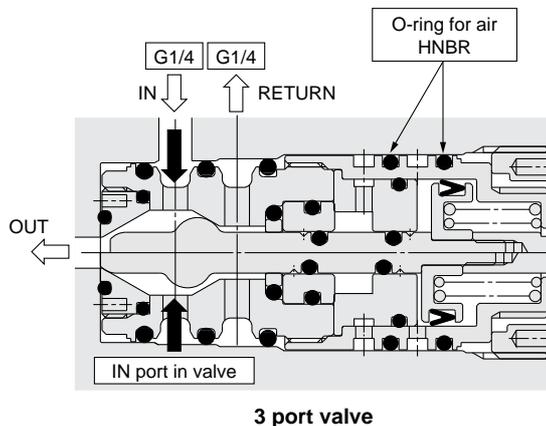
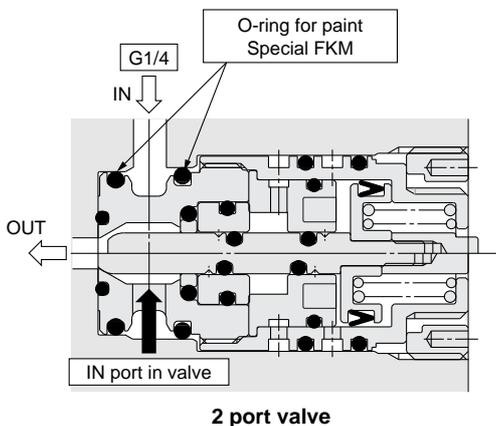
How to Attach the Valve



Apply vaseline (commercially available) onto the O-ring surface and insert straight. (Note the direction shown in the label.)



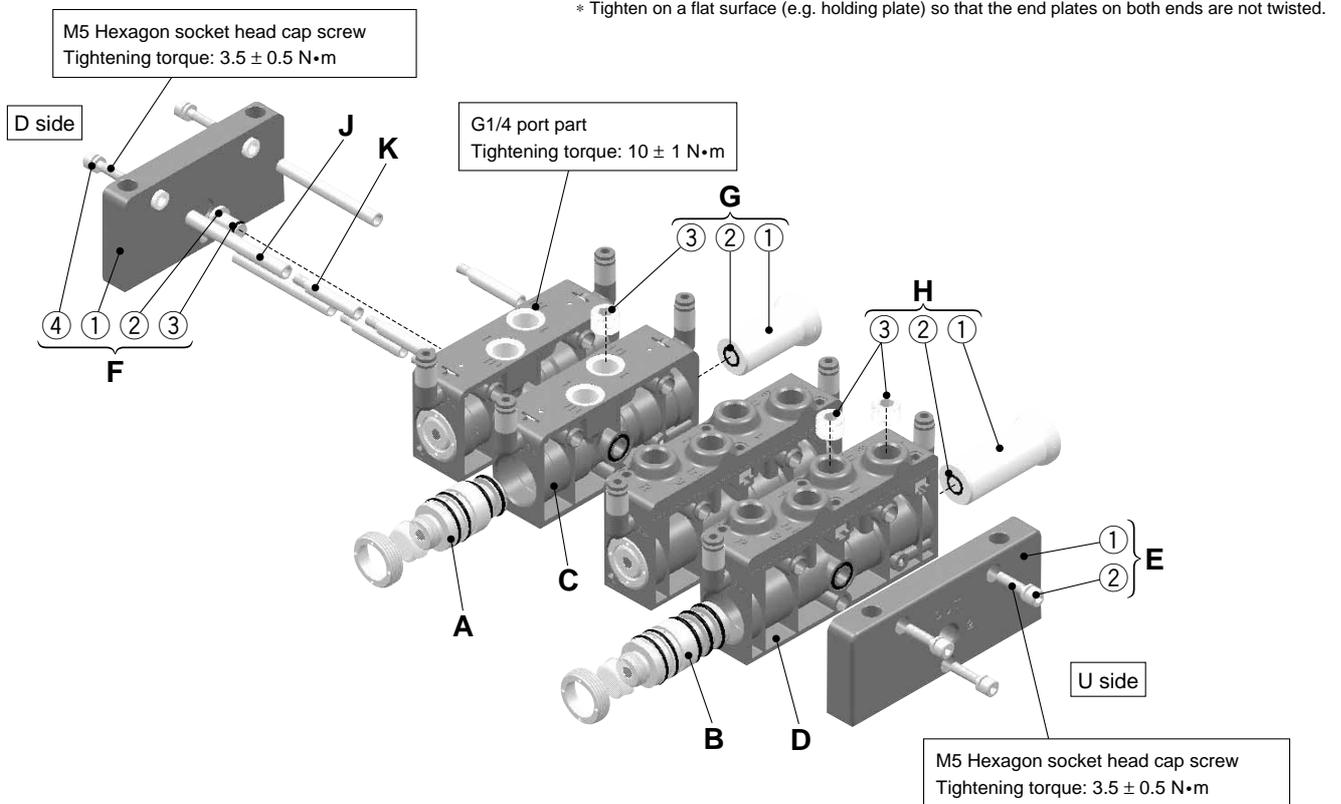
After mounting the indicator lamp cover, tighten the mounting nut to a tightening torque of 2.5 to 3.5 N·m



Attach and remove the valve straight. If the paint applied to the O-ring adheres to the pneumatic passage, clean it. When inserting, apply vaseline to the O-ring and the inner surface of the base and insert slowly so that the O-ring is not twisted or cut. The arrow shown on the model label of the valve is set to the optimum direction for cleaning. Mount the valve so that the arrow comes to IN port position.

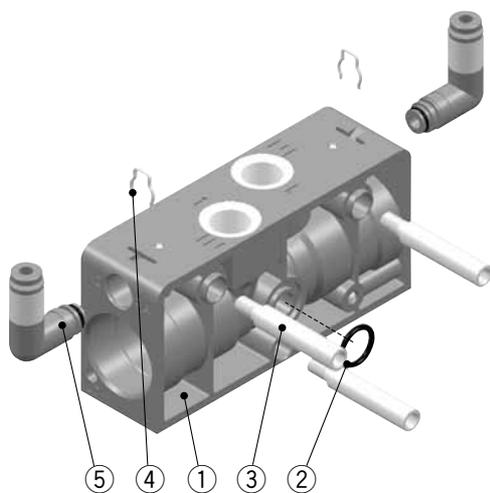
Replacement Parts

VV□CC1□: Manifold

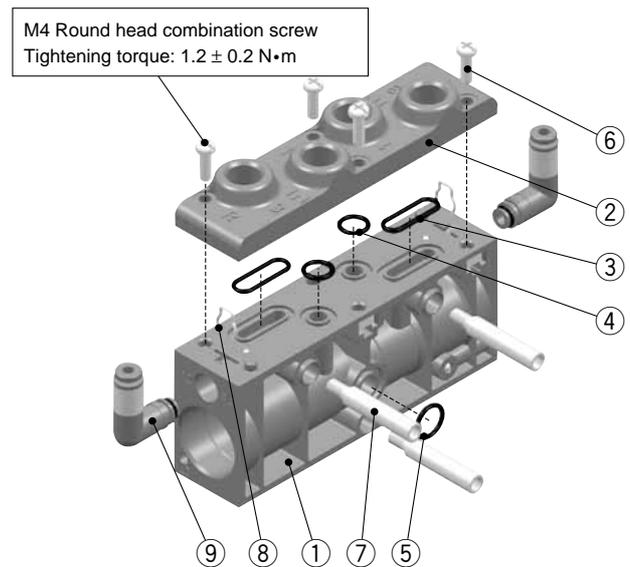


Block Assembly

C: 2 port valve manifold block assembly Manifold block assembly for gate valves



D: 3 port valve manifold block assembly

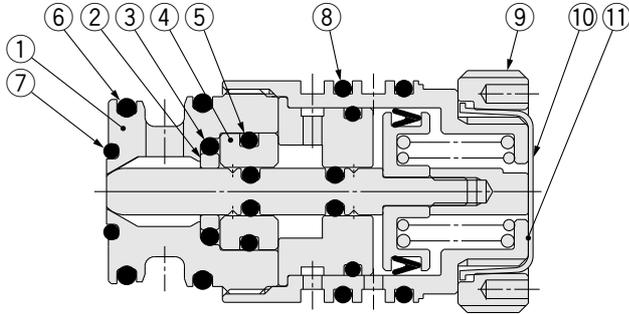


Component Parts

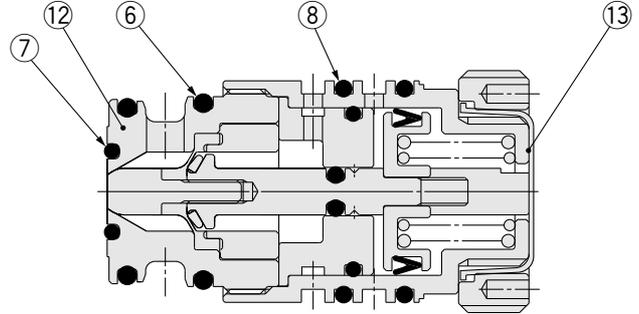
Model	Part no.	Description	Symbol	Component	Material	Qty.	Order qty.
VV2CC1 VV3CC1	VVCC12-OR-1	O-ring between manifold blocks	C-②	O-ring	Special FKM	1	10 set unit
VVMCC1 (common)			D-⑤				
VV3CC1 VVMCC1 (common)	VVCC12-50A-L1C4	ø4 one-touch fitting	C-⑤	One-touch fitting	—	1	1 set unit
	VVCC12-50A-L1C6	ø6 one-touch fitting	D-⑨	O-ring	HNBR	1	
VV3CC1 VVMCC1	VVCC13-OR-1	O-ring assembly between port blocks	D-③	O-ring	Special FKM	2	1 set unit
			D-④	O-ring	Special FKM	2	

2/3 Port Valve

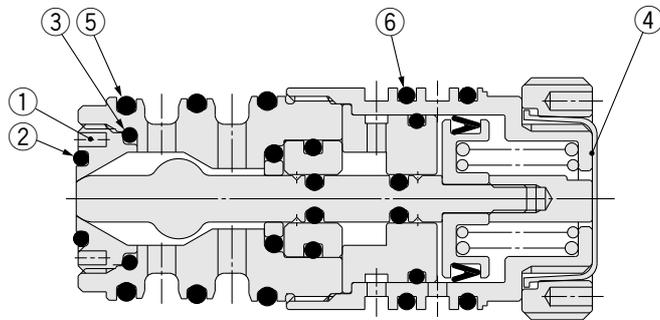
A: 2 port valve
Standard
VCC12-00



Diaphragm / 2 types of liquid paint
VCC12D-00



B: 3 port valve
VCC13-00



Component Parts

Model	Part no.	Description	Symbol	Component	Material	Qty.	Order qty.
VCC12(D)-00 (dedicated)	VCC12-1A-1 (for VCC12-00)	Orifice body assembly 	A-①	Orifice body	PEEK resin	1	1 set unit
			A-②	PTFE seal	Special PTFE	1	
			A-③	O-ring	Special FKM	1	
			A-④	Sleeve	POM	1	
			A-⑤	O-ring	Special FKM	1	
			A-⑥	O-ring	Special FKM	2	
			A-⑦	O-ring	Special FKM	1	
	A-⑪	Name plate	—	1			
	VCC12D-1A-1 (for VCC12D-00)	Orifice body assembly 	A-⑥	O-ring	Special FKM	2	1 set unit
			A-⑦	O-ring	Special FKM	1	
A-⑫			Orifice body	PEEK resin	1		
A-⑬			Name plate	—	1		
VCC12-OR-1	O-ring assembly	A-⑥	O-ring	Special FKM	2	1 set unit	
		A-⑦	O-ring	Special FKM	1		
		A-⑧	O-ring	HNBR	2		
VCC13-00 (dedicated)	VCC13-1A-1	Orifice assembly 	B-①	Orifice	PEEK resin	1	1 set unit
			B-②	O-ring	Special FKM	1	
			B-③	O-ring	Special FKM	1	
			B-④	Name plate	—	1	
	VCC13-OR-1	O-ring assembly	B-②	O-ring	Special FKM	1	1 set unit
			B-⑤	O-ring	Special FKM	3	
VCC12(D)-00 VCC13-00 (common)	VCC12-2A-1	Mounting nut assembly 	A-⑨	Mounting nut	Aluminum	1	1 set unit
			A-⑩	Switching display cover	A-PET	1	

Series VCC

Parts Description

Model	Symbol	Part no.	Description	Symbol	Description	Material	Surface treatment	Note
For 2 port valve	A	VCC12(D)-00	2 port valve	—	—	—	—	—
	C	VVCC12-1A-02F ^{C4} _{C6} * Pilot port C4: ø4 piping C6: ø6 piping	Manifold block assembly for 2 port valves	①	Manifold block	PPS resin	—	For VVCC12-1A-02F ^{C4} _{C6}
				②	O-ring	Aluminium	Hard anodized containing PTFE	For VVCC12-1G-02F ^{C4} _{C6}
				③	Tie-rod for adding stations	Special FKM	—	—
				④	Clip	Stainless steel	—	For adding stations
				⑤	One-touch fitting	Stainless steel	—	Refer to "Replacement Parts."
	E	VVCC12-2A-02F	U-side end plate assembly for 2 port valves	①	U-side end plate	Aluminium	Hard anodized containing PTFE	When the neighboring valve is a 2 port valve.
				②	Hexagon socket head cap screw with M5 SW	Stainless steel	—	
	F	VVCC12-3A-1	D-side end plate assembly for 2 port valves	①	D-side end plate	Aluminium	Hard anodized containing PTFE	When the neighboring valve is a 2 port valve.
				②	Plug	POM	—	
				③	O-ring	Special FKM	—	
				④	Hexagon socket head cap screw with M5 SW	Stainless steel	—	
	G	VVCC12-10A-1	Blanking plug assembly for 2 port valve	①	Blanking plug	POM	—	—
				②	O-ring	Special FKM	—	—
				③	R1/4 Hexagon socket head plug	Stainless steel	—	—
For 3 port valve	B	VCC13-00	3 port valve	—	—	—	—	—
	D	VVCC13-1A-02F ^{C4} _{C6} * Pilot port C4: ø4 piping C6: ø6 piping	Manifold block assembly for 3 port valves	①	Manifold block	PPS resin	—	—
				②	Port block	Aluminium	Hard anodized containing PTFE	—
				③	O-ring	Special FKM	—	—
				④	O-ring	Special FKM	—	—
				⑤	O-ring	Special FKM	—	—
				⑥	Round head combination screw with M4 SW	Stainless steel	—	—
				⑦	Tie-rod for adding stations	Stainless steel	—	For adding stations
				⑧	Clip	Stainless steel	—	—
				⑨	One-touch fitting	—	—	Refer to "Replacement Parts."
	E	VVCC13-2A-02F	U-side end plate assembly for 3 port valves	①	U-side end plate	Aluminium	Hard anodized containing PTFE	When the neighboring valve is a 3 port valve.
				②	Hexagon socket head cap screw with M5 SW	Stainless steel	—	
	F	VVCC13-3A-1	D-side end plate assembly for 3 port valves	①	D-side end plate	Aluminium	Hard anodized containing PTFE	When the neighboring valve is a 3 port valve.
				②	Plug	POM	—	
				③	O-ring	Special FKM	—	
④				Hexagon socket head cap screw with M5 SW	Stainless steel	—		
H	VVCC13-10A-1	Blanking plug assembly for 3 port valves	①	Blanking plug	POM	—	—	
			②	O-ring	Special FKM	—	—	
			③	R1/4 Hexagon socket head plug	Stainless steel	—	—	
Common	J	VVCC12-20A-□	Tie-rod	—	—	Stainless steel	—	□ = Three manifold blocks make up one set.
	K	VVCC12-21A	Tie-rod for adding stations	—	—	Stainless steel	—	Note) 3 pcs. make up one set.

Note) When the manifold is shipped out, tie-rods for two extra stations are used. You can add or reduce 2 stations of manifold block (4 valves in total).

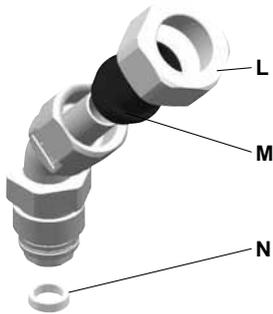
Example) For manifold block 4 stations (8 valves)

Tie-rod for 2 stations (VVCC12-20A-2)	Tie-rod for adding stations (VVCC12-21A)	Tie-rod for adding stations (VVCC12-21A)
------------------------------------------	---------------------------------------------	---------------------------------------------

Example) For manifold block 5 stations (10 valves)

Tie-rod for 3 stations (VVCC12-20A-3)	Tie-rod for adding stations (VVCC12-21A)	Tie-rod for adding stations (VVCC12-21A)
------------------------------------------	---------------------------------------------	---------------------------------------------

SUS316L Stainless Steel Fitting



Component Parts

Model	Symbol	Part no.	Description	Conforming item	Material	Qty.	Order qty.
K VCKL□□□□-02F H	L	KFN-06-X2	Union nut	K VCKL0604-02F H	C3604BD + Ni plated	1	1 set unit
		KFN-08-X2		K VCKL0806-02F H			
		KFN-10-X2		K VCKL1075-02F H			
				K VCKL1008-02F H			
		KFN-12-X2		K VCKL1209-02F H			
	M	KFS-06	Sleeve	K VCKL0604-02F H	Nylon	1	1 set unit
		KFS-08		K VCKL0806-02F H			
		KFS-10		K VCKL1075-02F H			
				K VCKL1008-02F H			
		KFS-12		K VCKL1209-02F H			
	N	VCKK-4-1	Gasket		Nylon	1	10 set unit



Series VCC

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 ^{Note 1)}, JIS B 8370 ^{Note 2)} and other safety practices.

■ Explanation of the Labels

Labels	Explanation of the labels
 Danger	In extreme conditions, there is a possible result of serious injury or loss of life.
 Warning	Operator error could result in serious injury or loss of life.
 Caution	Operator error could result in injury ^{Note 3)} or equipment damage. ^{Note 4)}

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

Note 3) Injury indicates light wounds, burns and electrical shocks that do not require hospitalization or hospital visits for long-term medical treatment.

Note 4) Equipment damage refers to extensive damage to the equipment and surrounding devices.

■ Selection/Handling/Applications

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

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or post analysis and/or tests to meet the specific requirements. The expected performance and safety assurance are the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators. (Understanding JIS B 8370 General Rules for Pneumatic Equipment, and other safety rules are included.)

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

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven objects have been confirmed.
2. When equipment is removed, confirm that safety process as mentioned above. Turn off the supply pressure for this equipment and exhaust all residual compressed air in the system, and release all the energy (liquid pressure, spring, condenser, gravity).
3. Before machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc.

4. If the equipment will be used in the following conditions or environment, please contact SMC first and be sure to take all necessary safety precautions.

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, requiring special safety analysis.
4. If the products are used in an interlock circuit, prepare a double interlock style circuit with a mechanical protection function for the prevention of a breakdown. Examine the devices periodically if they function normally or not.

■ Exemption from Liability

1. SMC, its officers and employees shall be exempted from liability for any loss or damage arising out of earthquakes or fire, action by a third person, accidents, customer error with or without intention, product misuse, and any other damages caused by abnormal operating conditions.

2. SMC, its officers and employees shall be exempted from liability for any direct or indirect loss or damage, including consequential loss or damage, loss of profits, or loss of chance, claims, demands, proceedings, costs, expenses, awards, judgments and any other liability whatsoever including legal costs and expenses, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

3. SMC is exempted from liability for any damages caused by operations not contained in the catalogues and/or instruction manuals, and operations outside of the specification range.

4. SMC is exempted from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.



Series VCC Specific Product Precautions 1

Be sure to read this before handling. For Safety Precautions, refer to back page 1.
For Precautions, refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

Design

⚠ Warning

1. Cannot be used as an emergency shutoff valve, etc.

The valves presented in this catalogue are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

2. Maintenance space

The installation should allow sufficient space for maintenance activities.

3. When an impact, such as water hammer, etc., caused by the rapid pressure fluctuation is applied, the solenoid valve may be damaged. Handle with care.

Selection

⚠ Warning

1. Confirm the specifications.

Give careful consideration to the operating conditions such as the application, fluid and environment, and use within the operating ranges specified in this catalogue.

2. Fluid

1) Applicable fluids on the list may not be used depending on the operating condition.

Give adequate confirmation, and then determine a model, just because the compatibility list shows the general case.

3. Air quality

1) Use clean air.

Do not use compressed air containing chemicals, synthetic oils, organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

2) Install air filters.

Install air filters close to the valves at their upstream side. A filtration degree of 5 μm or less should be selected.

3) Install an air dryer or after-cooler, etc.

Compressed air that includes excessive drainage may cause malfunction of the valves and other pneumatic equipment. To prevent this, install an air dryer or after-cooler.

4) If excessive carbon powder is generated, eliminate it by installing mist separators at the upstream side of the valves.

If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause malfunction.

Refer to SMC's "Best Pneumatics" catalogue for further details on compressed air quality.

4. Ambient environment

Use within the operable ambient temperature range. Confirm the compatibility between the product's composition materials and the ambient atmosphere. Be sure that the used fluid does not touch the external surface of the product.

5. Countermeasures against static electricity

Take measures to prevent static electricity since some fluids can cause static electricity.

Piping

⚠ Caution

1. Preparation before piping

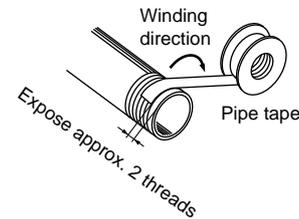
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

Install piping so that it does not apply pulling, pressing, bending or other forces onto the valve body.

2. Wrapping of pipe tape

When connecting pipes, fittings, etc., be sure that chips from the pipe threads and sealing material do not enter the valve.

Furthermore, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



3. Avoid connecting ground lines to piping, as this may cause electric corrosion of the system.

4. Always tighten threads with the proper tightening torque.

When attaching fittings to valves, tighten with the proper tightening torque shown below.

Tightening Torque for Piping

Connection threads	Proper tightening torque N·m
Rc 1/8	7 to 9
Rc 1/4	12 to 14
G 1/4	9 to 11

5. Connection of piping to products

When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.

Operating Environment

⚠ Warning

1. Do not use valves in atmospheres having corrosive gases, chemicals, salt water, water, steam, or where there is direct contact with any of these.

2. Do not use in locations subject to vibration or impact.

3. Do not use in locations where radiated heat will be received from nearby heat sources.

4. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.



Series VCC

Specific Product Precautions 2

Be sure to read this before handling. For Safety Precautions, refer to back page 1.
For Precautions, refer to “Precautions for Handling Pneumatic Devices” (M-03-E3A).

Maintenance

Caution

1. Filters and strainers

- 1) Be careful regarding clogging of filters and strainers.
- 2) Replace filter elements after one year of use, or earlier if the pressure drop reaches 0.1 MPa.
- 3) Clean strainers when the pressure drop reaches 0.1 MPa.

2. Storage

In case of long term storage, clean after use with heated water and thoroughly remove all moisture to prevent rust and deterioration of rubber materials, etc.

3. Exhaust the drain from an air filter periodically.



Series VCC

Specific Product Precautions 3

Be sure to read this before handling. For Safety Precautions, refer to back page 1.
For Precautions, refer to "Precautions for Handling Pneumatic Devices" (M-03-E3A).

Design

Warning

1. Leakage detection port

The valve has a leak detection area to completely separate the fluid area from the pilot pressure area. If leakage is found, valve replacement and maintenance are necessary immediately. Fluids that solidify or cure may block the leak detection, so port and leak may not be detected.

2. If applying high voltage to the fluid, it must be earthed by using the bolt to mount the base.

Do not use sealing tape when piping, as it may insulate.

Selection

Caution

1. Operating fluid

Eliminate all solid material larger than 150 μm in the fluid to avoid valve failure.

Piping

Caution

1. Piping to pilot port

Condensation may be formed in the piping to the pilot port, due to factors such as its length. The life of the valve will be shortened if condensed moisture enters the pilot port. To prevent condensation, the installation of a quick exhaust is recommended.

Lubrication

Caution

1. Do not lubricate the valve.

The valve uses white vaseline as lubricant.

Maintenance

Caution

1. Removing the product

- 1) Shut off the fluid supply and release the fluid pressure in the system.
- 2) Dismount the product.

2. Low frequency operation

Switch valves at least once every 30 days to prevent malfunction. Also, in order to use it under the optimum state, conduct a regular inspection once half a year.

3. Stoppage of line

When the line is stopped for a long time, clean the valve so that fluid (paint, ink, etc.) does not solidify or get cured.

Fill in this format.

Date: Year ____ / Month ____ / Date ____

Company name	Department	Person in charge
Phone	Fax	Repeat <input type="checkbox"/> Repeat <input type="checkbox"/> Not Repeat <input type="checkbox"/>
Device description	Drawing number	Production number

Ordered part number (Please order with this part number.)

Manifold valve part no. _____ SMC use _____

Manifold V V □ C C 1 - □ □ □ □ - □ □ □ □ } To fill in the blanks □ in the manifold number, please refer to the symbols in the catalogue. Select the valve referring to the specification table.

Valve V C C 1 □ □ - 0 0

Specification Sheet

* Fill in the symbol for stainless steel fitting. For others, mark necessary items with a circle.

Unit	Cleaning unit (with gate valve) ^{Note 2)}	Standard unit																		
		G06	G04	G02	02	04	06	08	10	12	14	16	18	20					40	
2 port valve	D side	Part number (Mountable valve number)	4	2	1	1	3	5	7	9	11	13	15	17	19					39
		Stations ^{Note 1)}	5	3	Gate	2	4	6	8	10	12	14	16	18	20					40
		Description/Model	2 port valve (Sliding type) VCC12-00																	
		Valve options	2 port valve (Diaphragm type) VCC12D-00																	
3 port valve	D side	Blanking plug for 2 port valve VVCC12-10A-1																		
		Fitting ^{Note 3)}	Piping port IN port																	

Unit	Cleaning unit (with gate valve) ^{Note 2)}	Standard unit																		
		G06	G04	G02	02	04	06	08	10	12	14	16	18	20					40	
3 port valve	D side	Part number (Mountable valve number)	1	3	5	1	3	5	7	9	11	13	15	17	19					39
		Stations ^{Note 1)}	4	2	Gate	2	4	6	8	10	12	14	16	18	20					40
		Description/Model	3 port valve (Sliding type) VCC13-00																	
		Valve options	Blanking plug for 3 port valve VVCC13-10A-1																	
3 port valve	D side	Piping port IN port																		
		Fitting ^{Note 3)}	Piping port RETURN port																	

Select stainless steel fitting for IN, RETURN port from the table below, and enter the symbol into the specification table.

Symbol	Description	Part no.	Symbol	Description	Part no.
A	For piping ø12 x ø9 40° swivel elbow	VCKK1209-02F	F	For piping ø12 x ø9 Male connector	VCKH1209-02F
B	For piping ø10 x ø8 40° swivel elbow	VCKK1008-02F	G	For piping ø10 x ø8 Male connector	VCKH1008-02F
C	For piping ø10 x ø7.5 40° swivel elbow	VCKK1075-02F	H	For piping ø10 x ø7.5 Male connector	VCKH1075-02F
D	For piping ø8 x ø6 40° swivel elbow	VCKK0806-02F	J	For piping ø8 x ø6 Male connector	VCKH0806-02F
E	For piping ø6 x ø4 40° swivel elbow	VCKK0604-02F	K	For piping ø6 x ø4 Male connector	VCKH0604-02F

Fill in the model number in the table below for connecting the fitting to the OUT port. (See SUS316L stainless steel fitting type.) For connecting the elbow union, the piping direction is on top (IN, RETURN port side).

OUT port Stainless steel fitting V C K □ □ □ □ - 0 2 F

Note 1) Two valves can be installed per manifold block. Assign two valves in one square.
 Note 2) Please order a cleaning unit when the gate valve is necessary.
 Note 3) When the fitting is necessary for IN, RETURN port, please order by selecting the necessary stainless steel fitting symbol in the port of each station. For 40° swivel elbow, the piping direction is on D side.

Customer code	U/C	Department code	Code for person in charge	Registered image no.
Fill in for faxed order	Customer's order no.	Date of delivery	SMC order no.	

Part no.	Qty.	Part no.	Qty.	Part no.	Qty.
1	6	11			
2	7	12			
3	8	13			
4	9	14			
5	10	15			

Manifold Specifications — Example of how to fill in

Condition	Valve type		Valve arrangement	Fitting arrangement		
	2 port valve		7 pcs.	IN port	ø10 x ø8 (40° swivel elbow)	
	3 port valve		24 pcs.	IN port	ø12 x ø9 (40° swivel elbow)	
				RETURN port	ø6 x ø5 (Male connector)	
	Cleaning unit	Gate valve	1 pc.			
Cleaning valve		4 pcs.	IN port	ø8 x ø6 (40° swivel elbow)		
			OUT port	ø10 x ø8 (90° swivel elbow)		
			Pilot port	One-touch fitting for ø4		

Put "M", because 2 port valves (including a cleaning unit) and 3 port valves are installed together.

Seven (7) 2 port valves are installed. Since two valves are installed per manifold base, it must be an even number, so the number of the valve that can be installed is "08". * Specify four (4) stations for manifold

When twenty-four (24) 3 port valves are used, specify "24". * Specify twelve (12) stations for manifold.

Specify when the gate valve is necessary for cleaning the valve. This example requires one gate valve and four cleaning valves, but specify "06" as the number of valves that can be installed, as this must be an even number.

Manifold
 Valve

VVMCC1-08 24 C4-G06

Pilot port piping size

To fill in the blanks in the manifold number, please refer to the symbols in the catalogue. Select the valve referring to the specification table.

* Fill in the symbol for stainless steel fittings. For others, mark necessary items with a circle.

The upper table is for 2 port valves. The lower is for 3 port valves.

Part number (Mountable valve number)	Stations (Note 1)	Description/Model	Standard unit																														
			G06	G04	G02	02	04	06	08	10	12	14	16	18	20					40													
2 port valve - Valve options Fitting (Note 3) IN port	4	5	2	3	1	Gate	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	/	/	/	/	39	40	
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
3 port valve - Valve options Fitting (Note 3) IN port RETURN port	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	→ 24									39	40		
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/

Select stainless steel fitting for IN, RETURN port from the table below, and enter the symbol into the specification table.

Symbol	Description	Part no.
A	For piping ø12 x ø9 40° swivel elbow	VCKK1209-02F
B	For piping ø10 x ø8 40° swivel elbow	VCKK1008-02F
C	For piping ø10 x ø7.5 40° swivel elbow	VCKK1075-02F
D	For piping ø8 x ø6 40° swivel elbow	VCKK0806-02F
E	For piping ø6 x ø4 40° swivel elbow	VCKK0604-02F

Symbol	Description	Part no.
F	For piping ø12 x ø9 Male connector	VCKH1209-02F
G	For piping ø10 x ø8 Male connector	VCKH1008-02F
H	For piping ø10 x ø7.5 Male connector	VCKH1075-02F
J	For piping ø8 x ø6 Male connector	VCKH0806-02F
K	For piping ø6 x ø4 Male connector	VCKH0604-02F

Fill in the model number in the table below for connecting the fitting to the OUT port. (See SUS316L stainless steel fitting type.)
For connecting the elbow union, the piping direction is on top (IN, RETURN port side).

OUT port Stainless steel fitting VCKL 1008-02F

It must be specified when the fitting is connected to the OUT port.

Note 1) Two valves can be installed per manifold block. Assign two valves in one square.
Note 2) Please order a cleaning unit when the gate valve is necessary.
Note 3) When the fitting is necessary for the IN, RETURN port, please order by selecting the necessary stainless steel fitting symbol in the port of each
For 40° swivel elbow, piping direction is on D side.

Customer/SMC use				Serial No.			
Customer code	U/C	Department code	Code for person in charge	Registered image no.			
Fill in for faxed order	Customer's order no.	Date of delivery	SMC order no.				
Component list							
Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.
1 VVMCC1-0824C4-G06	1	6 VCKK1008-02F	7	11			
2 VCC12-00	12	7 VCKK0806-02F	4	12			
3 VCC13-00	24	8 VCKH0604-02F	24	13			
4 VVCC12-10A-1	2	9 VCKL1008-02F	1	14			
5 VCKK1209-02F	24	10		15			

2 port valve is specified for the gate valve and the cleaning valve.
7 valves + 1 valve + 4 valves = 12 valves



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