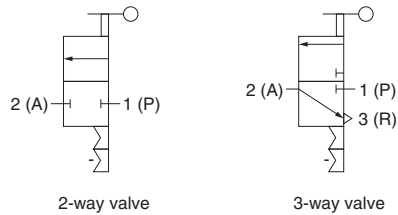


# HAND VALVES

- Valves for switching the flow path in the pipes.
- Can be installed in various locations, including horizontal connections.
- Both 3-way valves (standard type, with exhaust function) and 2-way valves are available.

## Symbol

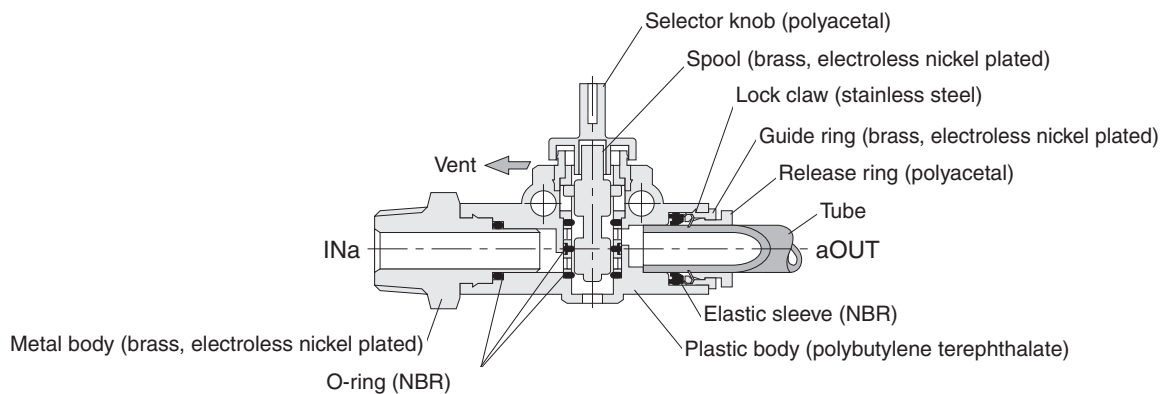


## Specifications

Media	Air
Operating pressure range	0~0.9MPa [0~131 psi]
Operating vacuum pressure	-100 kPa [-29.5 inHg]
Operating temperature range	0~60°C [32~140°F]
Recommended tube	Nylon tube, urethane tube
Sales unit	1 pc.

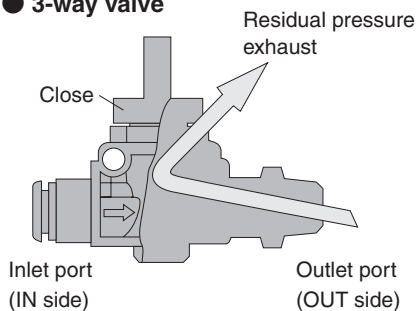
Note: The R port of the 3-way valves cannot be connected to pipes.

## Inner Construction, Major Parts and Materials



## Functions

### ● 3-way valve

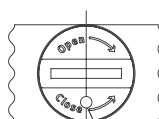


The 3-way valve can exhaust residual pressure (residual pressure remained in mounted equipment) left behind in the outlet port side when air has been shut off. Ensures safe operations during equipment maintenance and repairs, etc.

The 2-way valve is suitable for air supply to tanks and other equipment where exhausting residual pressure is not desired.

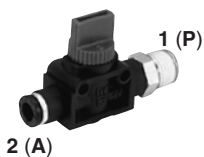
The 2-way valve is also suitable for use in vacuum piping.

Top of cap lever



② is a bidirectional valve. ③ is a tri-directional valve.

## ● FVB



Tube size	Thread size R			
	1/8	1/4	3/8	1/2
6	01	02	03	—
8	01	02	03	—
10	—	02	03	04
12	—	02	03	04

## Order codes

FVB



Number of ports

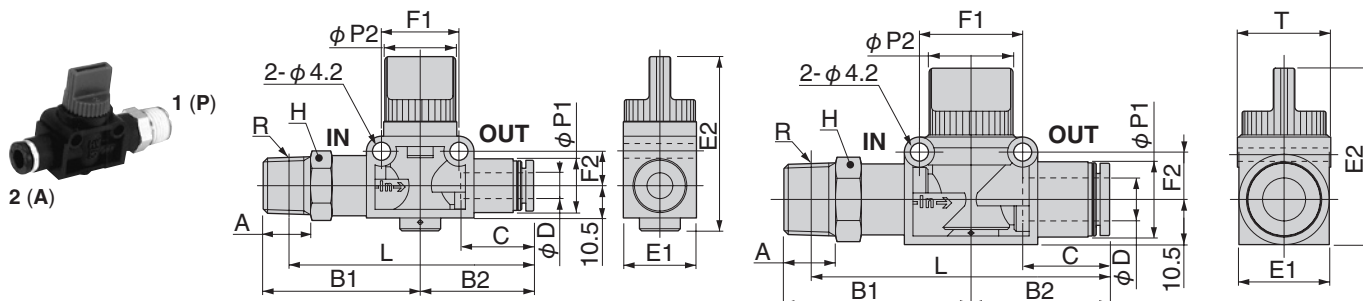
Blank — 3-way valve

2 — 2-way valve

Tube size of the outlet port

Thread size of the inlet port

## Dimensions mm

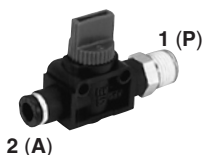
Straight B  
FVBTube outer diameter  $\phi$  6, 8Tube outer diameter  $\phi$  10, 12

Model	Tube outer diameter $\phi$ D	R	A	E1	E2	L <sup>Note</sup>	$\phi$ P1	$\phi$ P2	C	B1	B2	Width across flats H	F1	F2	T	Effective area mm <sup>2</sup>	Mass g
FVB01-6-□	6	R1/8	8	17	40.5	55.9	12.5	16.5	17	33.5	26.4	14	18	8	—	8.3	34
FVB02-6-□		R1/4	11			56.8				36.5						8.5	40
FVB03-6-□		R3/8	12			58.3				38.3						8.2	53
FVB01-8-□	8	R1/8	8	17	40.5	57.2	15	16.5	18.1	33.5	27.7	14	18	8	—	8.9	35
FVB02-8-□		R1/4	11			58.2				36.5							41
FVB03-8-□		R3/8	12			59.7				38.3							54
FVB02-10-□	10	R1/4	11	21	41	68.7	17.5	19.5	20.2	42.5	32.2	17	24	11	21.7	16.6	62
FVB03-10-□		R3/8	12			69.4				43.5						16.9	71
FVB04-10-□		R1/2	15			70.5				46.5						16.5	93
FVB02-12-□	12	R1/4	11	21	41	71.4	21	19.5	23.4	42.5	34.9	17	24	11	21.7	17	66
FVB03-12-□		R3/8	12			72.1				43.5						17.1	74
FVB04-12-□		R1/2	15			73.2				46.5						16.8	96

Note: The L dimensions are the reference dimensions after the fittings are assembled.

# Straight B

● FVB



Tube size	Thread size R			
	1/8	1/4	3/8	1/2
0.236	01	02	03	—
0.315	01	02	03	—
0.394	—	02	03	04
0.472	—	02	03	04

## Order codes

FVB



Number of ports

Blank — 3-way valve

2 — 2-way valve

Tube size of the outlet port

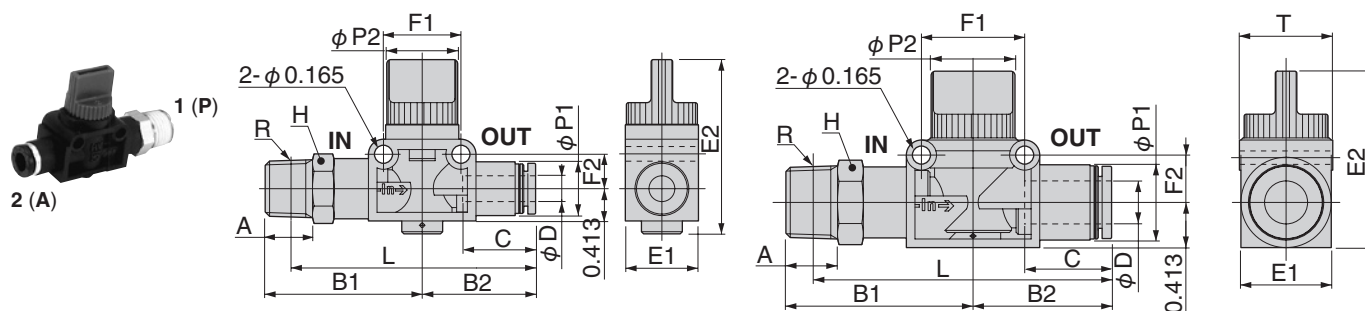
Thread size of the inlet port

## Dimensions in

### Straight B FVB

Tube outer diameter  $\phi$  0.236, 0.315

Tube outer diameter  $\phi$  0.394, 0.472



Model	Tube outer diameter $\phi$ D	R	A	E1	E2	L <sup>Note</sup>	$\phi$ P1	$\phi$ P2	C	B1	B2	Width across flats H	F1	F2	T	Effective area Cv	Mass oz
FVB01-6-□	0.236	R1/8	0.315	0.669	1.594	2.201	0.492	0.650	0.669	1.319	1.039	0.551	0.709	0.315	-	153.135	1.199
FVB02-6-□		R1/4	0.433			2.236				1.437						156.825	1.411
FVB03-6-□		R3/8	0.472			2.295				1.508						151.290	1.870
FVB01-8-□	0.315	R1/8	0.315	0.669	1.594	2.252	0.591	0.650	0.713	1.319	1.091	0.551	0.709	0.315	-	164.205	1.235
FVB02-8-□		R1/4	0.433			2.291				1.437							1.446
FVB03-8-□		R3/8	0.472			2.350				1.508							1.905
FVB02-10-□	0.394	R1/4	0.433	0.827	1.614	2.705	0.689	0.768	0.795	1.673	1.268	0.669	0.945	0.433	0.854	306.270	2.187
FVB03-10-□		R3/8	0.472			2.732				1.713						311.805	2.504
FVB04-10-□		R1/2	0.591			2.776				1.831						304.425	3.280
FVB02-12-□	0.472	R1/4	0.433	0.827	1.614	2.811	0.827	0.768	0.921	1.673	1.374	0.669	0.945	0.433	0.854	313.650	2.328
FVB03-12-□		R3/8	0.472			2.839				1.713						315.495	2.610
FVB04-12-□		R1/2	0.591			2.882				1.831						309.960	3.386

Note: The L dimensions are the reference dimensions after the fittings are assembled.

## Safety Precautions (Hand Valve)

The safety precautions for the hand valves are shown below. Be sure to read the material in the front of the General Personal Catalog regarding safety precautions other than those below.

### CAUTION

- To operate the cap lever, turn it 90° until it stops completely. Insufficiencies in flow volume and continuity due to incomplete switching may occur if it is not fully turned.
- Check the identification for bidirectional valves and tri-directional valves with the ② or ③ engraved on the top of the cap lever.
- Install a filter for the vacuum on the suction side when negative pressure is being used. Erratic operation may be caused by dirt that has been sucked into the product.

## Handling Instructions and Precautions

### ● Mounting

#### Precautions for mounting the body

- ① Use the appropriate tool to tighten the hex nuts on the hand valve's tapered threads for pipes.
- ② Refer to the following table of recommended tightening torques when tightening the threaded parts. If you use more than the recommended torque when tightening the threaded parts, you may cause leaks by damaging or deforming the threads. Also, if you use less than the recommended torque when tightening the threaded parts, it may result in looseness or leaks.

Recommended tightening torque

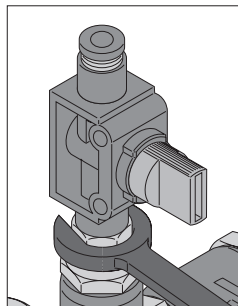
Thread type	Thread size	Tightening torque
Tapered threads for pipes	R1/8	7 to 9 N·m [61.957 to 79.659 in·lbf]
	R1/4	12 to 14 N·m [106.212 to 123.914 in·lbf]
	R3/8	22 to 24 N·m [194.722 to 212.424 in·lbf]
	R1/2	28 to 30 N·m [247.828 to 265.530 in·lbf]

#### Precautions for disconnecting fittings

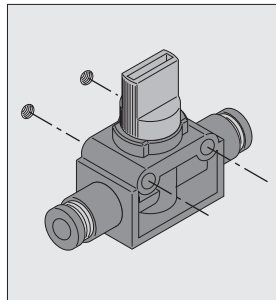
- ① Use the appropriate tool to remove the hex nuts from the hand valve's tapered threads for pipes.
- ② Remove the sealant from the threads on the other parts. If the sealant is stuck to the other parts, it may get into peripheral devices and cause a malfunction.

#### Fixing

- ① Tightening the hex nuts  
Tighten the hex nuts on straight A, B, and nipple type hand valves with a wrench.



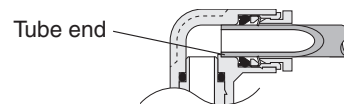
- ② Fixing to the body  
For union straight type hand valves, use the fixing holes on the plastic body and fix with M4 screws. (Refer to the diagram for the external dimensions of the body for the hole pitch to use for mounting.)



### ● Attaching and detaching tubes

#### Precautions for attaching tubes

- ① Confirm that the cut surface of the tube is cut straight across, that the outer surface of the tube is not damaged, and that the tube has not become oval shaped.
- ② When connecting tubes, if you do not insert the tube all the way to the tube end, it may result in leaks.



- ③ After installing the tube, pull on it to check that it does not come off.
- ④ Do not meaninglessly press on the release ring before attaching a tube. Doing so may cause the tube to become detached.

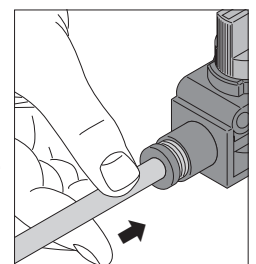
#### Precautions for removing tubes

- ① Before removing tubing, be sure to confirm that the pressure inside the tubing is zero.
- ② Uniformly press the release ring inwards as far as it goes and then pull out the tubing. If you do not fully press in on the release ring, the tube may not come out, or the tubing may become scratched causing debris to be left inside the fitting.

#### How to attach and detach tubes

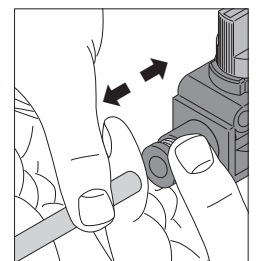
- ① Attaching tubes

Hand valves are equipped with lock claws that hold tubes in place when they have been pushed all the way to the end, and with an elastic sleeve for sealing the periphery around the tubes.



- ② Removing tubes

When removing a tube, pressing the release ring opens the lock claw and the tube can be pulled out. Be sure to stop the air before removing tubes.



## Handling Instructions and Precautions

If removing pipes is difficult because the piping space is very constricted, consult your nearest Koganei sales office for specialized tools that are available.

### Specialized tools for removing tubes

For  $\phi$  3 [0.118],  $\phi$  4 [0.157], and  $\phi$  6 [0.236] tubes  
Order codes: **UJ-1**



For  $\phi$  6 [0.236],  $\phi$  8 [0.315],  $\phi$  10 [0.394], and  $\phi$  12 [0.472] tubes  
Order codes: **UJ-2**



### Usable tubes

Use of both nylon tubing and urethane tubing are supported. Nylon tubing outside diameter precision should be within  $\pm 0.1$  mm [ $\pm 0.004$  in] (nominal) for nylon tubing and within  $\pm 0.15$  mm [ $\pm 0.006$  in] (nominal) for urethane tubing. Use tubing with ovality (difference between major axis and minor axis) within 0.2 mm [0.008 in] (use of Koganei tubing is recommended).

Use of tubing that is not a Koganei genuine product or a compatible (recommended) product may result in tube disconnection, air leakage, or other problems. Be sure to check on tubing before building a pneumatic system.



1. Use tubing with an exterior that is not damaged. If tubing becomes damaged after repeated use, cut off the damaged portion.
2. Do not allow tubing to become severely bent or twisted near the connection to a fitting. Such a condition creates the risk of air leakage. The table below shows minimum radius guidelines for nylon and urethane tubing.
3. Do not use extremely soft tubing, which causes a severe drop in pull-out strength.
4. Before removing any tubes, always turn off the air supply. Also, be sure to confirm that the air inside the pipes is completely vented before starting.

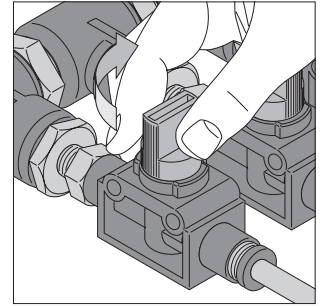
mm [in]

Tube size	Minimum bending radius	
	Nylon tube	Urethane tube
$\phi$ 6 [0.236]	30 [1.181]	15 [0.591]
$\phi$ 8 [0.315]	50 [1.969]	20 [0.787]
$\phi$ 10 [0.394]	80 [3.150]	27 [1.063]
$\phi$ 12 [0.472]	150 [5.9]	35 [1.378]

### Operating the cap lever

#### When opening air

Turning the cap lever clockwise 90° until it stops causes air to flow.



#### When closing the air

Turning the cap lever counter-clockwise 90° until it stops causes air to stop flowing. Also, when using tri-directional valves, the OUT side's residual pressure is vented at the same time when you are finished turning the cap lever.

