

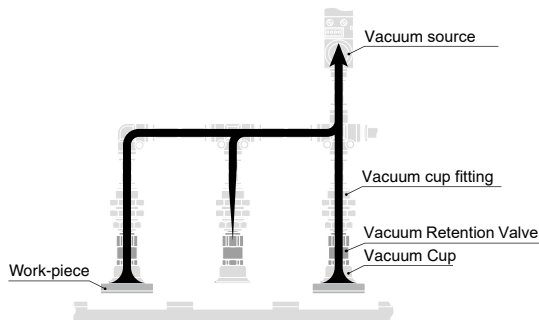
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## Valves for several Vacuum Cups with one Vacuum System

# Vacuum Retention Valve

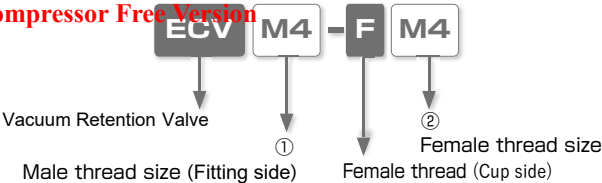
- *Minimize vacuum loss when vacuum cup seal is lost.*
- *Maintaining the vacuum level is crucial to the performance of vacuum systems which have one vacuum source with multiple vacuum cups.*
- *Eliminating the problem of vacuum loss through non-working vacuum cups and making other cups work normally.*
- *Replaceable filter is integrated*
- *Direct-mounting to vacuum cups*



# Vacuum Retention Valve

## Model Designation (Example)

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### ① Male thread size (Fitting side)

Thread type	Metric thread					Taper pipe thread
Code	M3	M4	M5	M6	M10	O1
Size (mm)	M3×0.5	M4×0.7	M5×0.8	M6×1	M10×1.5	R1/8

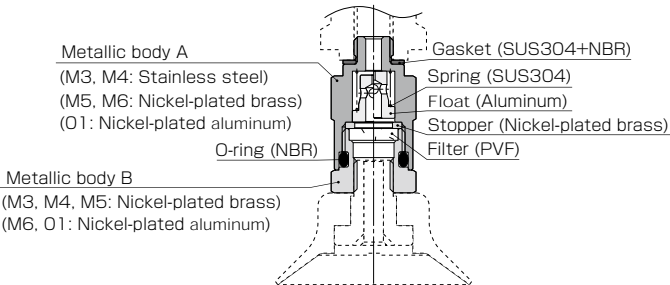
### ② Female thread size (Cup side)

Thread type	Metric thread					Taper pipe thread
Code	M3	M4	M5	M6	M10	O1
Size (mm)	M3×0.5	M4×0.7	M5×0.8	M6×1	M10×1.5	Rc1/8

## Specifications

Fluid medium	Air
Operating pressure range	Positive pressure : 0 ~ 100 psi (0 ~ 0.7MPa) Negative pressure : 0 ~ -29.5inHg (0 ~ -100kPa)
Min. cracking pressure	-2 inHg (-7kPa)
Operating temp. range	32 ~ 140°F (0 ~ 60°C) (no freezing)

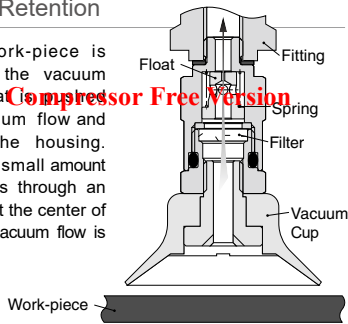
## Construction



## Mechanism

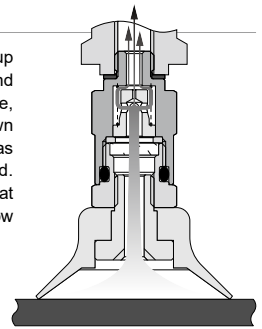
### Vacuum Retention

When a work-piece is apart from the vacuum cup, the float is pushed up by vacuum flow and seals on the housing. In this state, small amount of air passes through an orifice hole at the center of the float. Vacuum flow is checked.



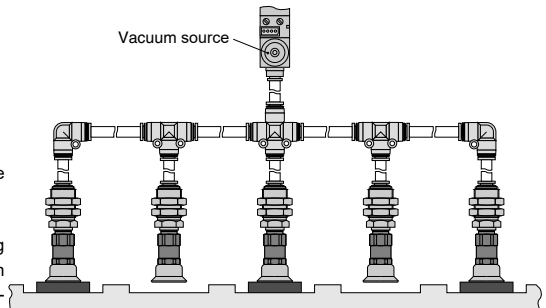
### Suction State

When the vacuum cup comes in contact and seals on a work-piece, the float is pushed down by a spring force as vacuum flow is reduced. This breaks the seal at the float and vacuum flow is in the full open state.



## Mechanism

Minimizing vacuum loss to maintain a certain vacuum level is critical to the performance of vacuum systems which have a single vacuum generator or a vacuum cup with multiple vacuum cups. Vacuum Retention Valves eliminate the problem of vacuum loss through non-working vacuum cups and maintain the level of vacuum so that other vacuum cups work correctly. Once vacuum retention valve is checked, a small amount of metered flow occurs. So it is critical to figure out how many non-working vacuum cups are acceptable in the system and provide a safety measure against work-piece drops if needed.



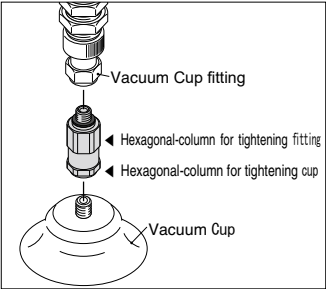
## Applicable Vacuum Cup List

Model code	Vacuum Cup type	Cup size (mm)	Fitting type (including Level Compensator)					
			VPA	VPB	VPC	VPD	VPE	VPF
			VPMA	VPMB	VPMC	VPMD	VPME	—
ECVM3-FM3	Standard (Small type)	ø0.7, ø1, ø1.5, ø2, ø3, ø4			—		○	—
	Standard (General type)	ø1, ø2, ø3, ø4			—		○	—
	Standard (General type & Deep type)	ø10, ø15			○		—	○
ECVM4-FM4	Bellows	ø10, ø15			○		—	○
	Multi-Bellows	ø10			○		—	○
	Soft	ø4, ø6, ø8, ø10, ø15			○		—	○
	Soft Bellows	ø6, ø8, ø10, ø15			○		—	○
	Flat	ø10, ø15			○		—	○
	Skidproof	ø10			○		—	○
	Mark-free	ø10			○		—	○
	Standard (General type)	ø6, ø8			—		○	—
ECVM5-FM5	Bellows	ø6, ø8			—		○	—
	Ultrathin Object	ø8, ø10, ø15, ø20			—		○	—
	Standard (General type & Deep type)	ø20, ø25, ø30, ø40, ø50			○		—	○
ECVM6-FM6	Sponge	ø10, ø15, ø20, ø25, ø30, ø35, ø50			○		—	○
	Bellows	ø20, ø25, ø30, ø40, ø50			○		—	○
	Multi-Bellows	ø20, ø30, ø40, ø50			○		—	○
	Oval	2 × 4 ~ 8 × 30			○		—	○
	Soft	ø20, ø30, ø40			○		—	○
	Soft Bellows	ø20			○		—	○
	Flat	ø20, ø25, ø30			○		—	○
	Skidproof	ø20, ø30, ø40, ø50			○		—	○
	Mark-free	ø20, ø30			○		—	○
	Standard (General type & Deep type)	ø60, ø80, ø100			○		—	—
ECVM10-FM10	Sponge	ø70, ø100			○		—	—
	Bellows	ø60, ø80, ø100			○		—	—

# Vacuum Retention Valve

## How to install and disconnect

In order to install Vacuum Retention Valve, tighten hexagonal-columns with a wrench. Refer to the dimensional drawings for detail.



## ⚠ Detailed Safety Instructions

Before using PISCO products, be sure to read "Safety Instructions" and "Safety Instruction Manual" and "Common Safety Instructions for Vacuum Series".

### Warning

1. Vacuum Retention Valve is not a check valve. Unless a vacuum supply side has the vacuum check function, Vacuum Retention Valve can not hold vacuum. Do not use it for a vacuum retention purpose.
2. Though several Vacuum Retention Valves can be used with a single vacuum supply, make sure to test them with an actual system before operation.
3. When a leakage amount from vacuum cup Sponge Series exceeds switching flow rates, the valve may start to operate and there is a risk of dropping work-piece.

### Caution

#### 1. Safety Rules for Installation and Disconnection

- ① Use a proper tool to install and disconnect Vacuum Retention Valve.
- ② Refer to the following tightening torque to tighten thread.

Table : Tightening torque

Thread size	Tightening torque
M3×0.5	0.5N·m
M4×0.7	1 ~ 1.2N·m
M5×0.8	1.0 ~ 1.5N·m
M6×1	1.5 ~ 2N·m
M10×1.5	5.0 ~ 7.0N·m
R1/8	4.5 ~ 6.5N·m

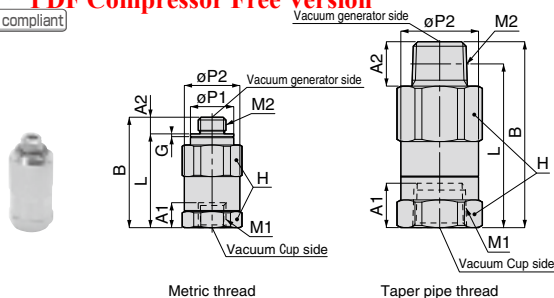
#### 2. Safety Rules for Fixing Position

- ① When male tread of Vacuum Retention Valve is connected with other equipment or vacuum cup fitting, use the hexagonal-column of male thread side to tighten them. Refer to the above recommended tightening torque.
  - ② When female thread of Vacuum Retention Valve is connected with other equipment or vacuum cup, use the hexagonal-column of female thread side to tighten them. Refer to the above recommended tightening torque.
3. Since there is a small amount of vacuum loss during Vacuum Retention Valve is checked, make sure to test the Valve with an actual system when a pressure sensor is used to control the vacuum system. Pay attention when the sensor is set, for the vacuum loss becomes smaller in case the filter element is clogged.

# ECV Vacuum Retention Valve

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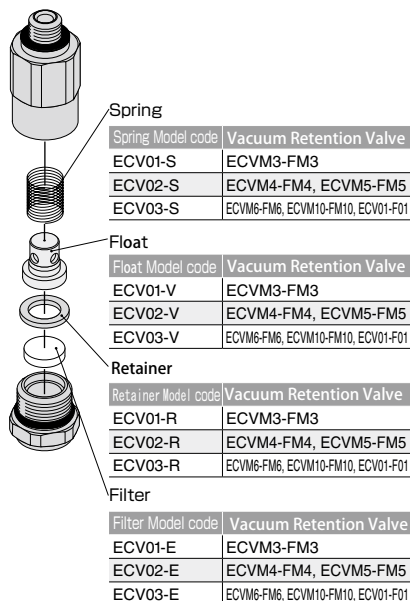
RoHS compliant



Unit : mm

Model code	M1	M2	A1	A2	B	L	G	øP1	øP2	Hex. H	Minimum suction flow for valve operation (ℓ/min[ANR])	Suction flow after valve operation (ℓ/min[ANR])	Effective area(mm²)		Weight (g)
													Free flow		
ECVM3-FM3	M3x0.5	M3x0.5	4.5	2.5	18.4	15.9	0.5	5.5	8	8	2	1.3	0.7		4.9
ECVM4-FM4	M4x0.7	M4x0.7	4.5	2.9	19.9	17	0.6	7.8	10	10	5	1.3	1.6		7.9
ECVM5-FM5	M5x0.8	M5x0.8	4.5	3	19.9	16.9	0.5	7.8	10	10	5	1.3	1.6		6.6
ECVM6-FM6	M6x1	M6x1	5	4	28.1	24.1	0.5	8.8	12	12	13	1.3	4.0		13
ECVM10-FM10	M10x1.5	M10x1.5	10	7.5	40	32.5	2.5	14	14	14	13	1.3	4.8		11
ECV01-F01	Rc1/8	R1/8	8	8	33.5	29.5	—	—	14	14	13	1.3	4.8		10

## Replacement Element



Thoroughly read this catalog to understand the construction of Vacuum Retention Valve, and confirm the Safety Rules below when filter elements are replaced. Pay attention not to lose components of the product.

### 【Safety Rules for Installation and Disconnection】

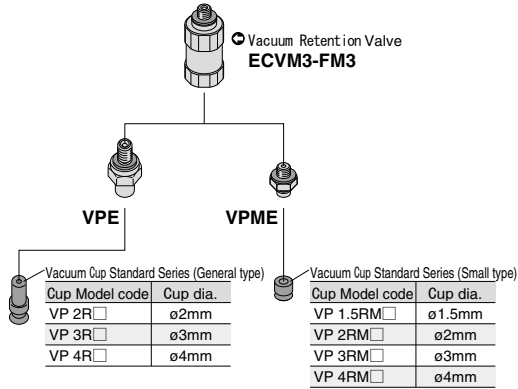
- ① Use a proper tool to install and disconnect filter elements.
- ② Refer to the following recommended tightening torque to tighten thread.

Table: Recommended tightening torque

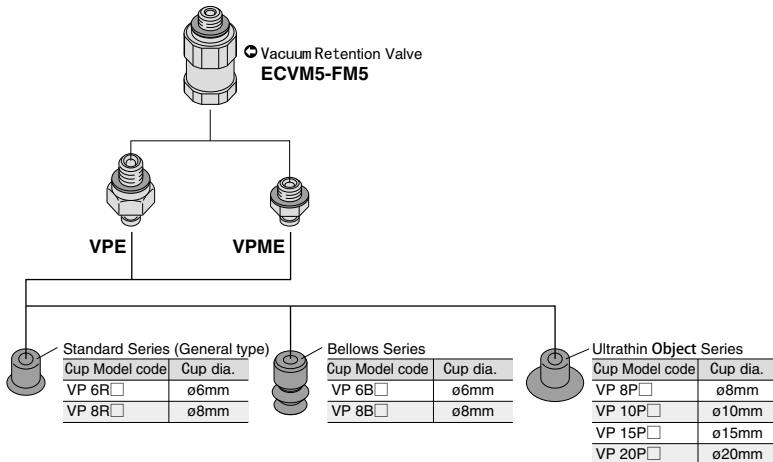
Thread size	Tightening torque
M6x0.75	0.8 ~ 1.0N·m (ECVM3-FM3)
M8x0.75	1.0 ~ 2.0N·m (ECVM4-FM4, ECV05-FM5)
M10x1	3.0 ~ 4.0N·m (ECVM6-FM6, ECV10-FM10, ECV01-F01)

## Construction (ECVM3-FM3 / ECVM5-FM5)

● Cup dia. : ø6mm, ø8mm, ø10mm, ø15mm, ø20mm



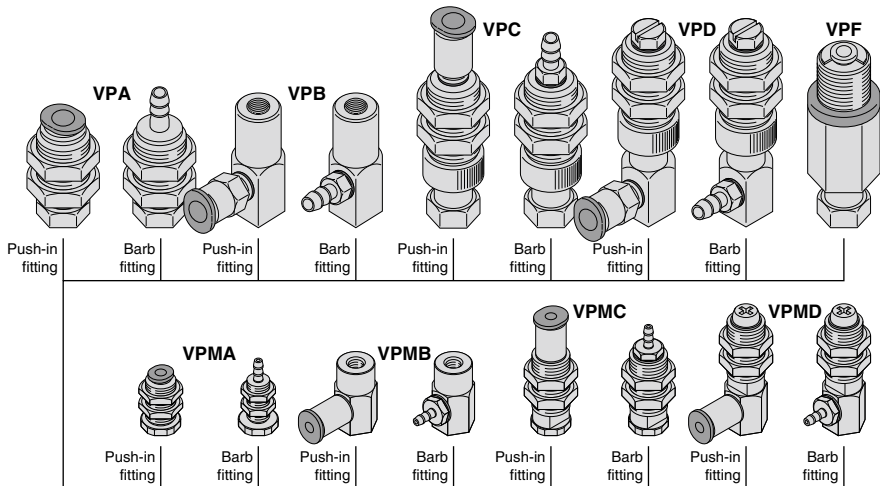
● Cup dia. : ø6mm, ø8mm, ø10mm, ø15mm, ø20mm



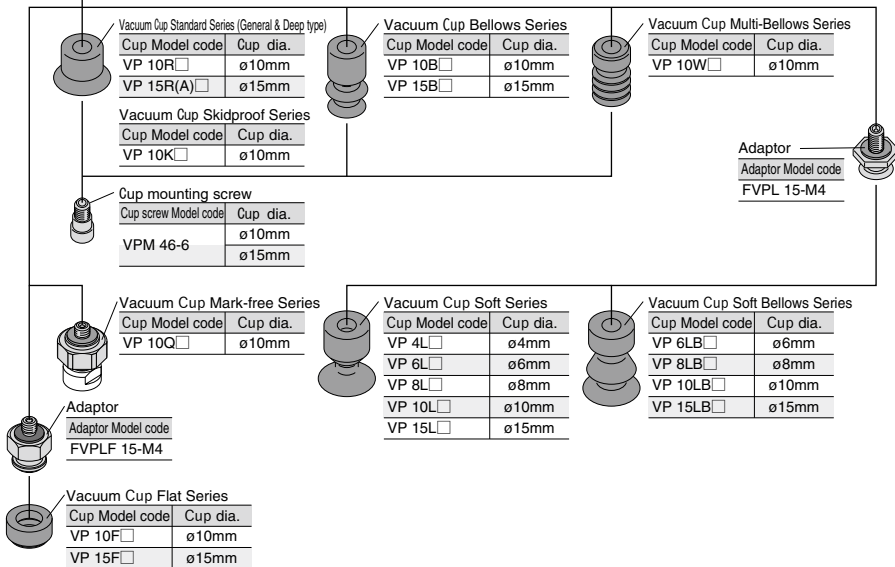
# Vacuum Retention Valve

## Construction (ECVM4-FM4)

● Cup dia. 6mm or 15mm



● Vacuum Retention Valve  
**ECVM4-FM4**



## Construction (ECVM6-FM6)

- Cup dia. 20mm, 25mm, 30mm, 40mm, 50mm, ø30mm, ø35mm, ø40mm, ø50mm

