# Vacuum Saving Valve
# *ZP2V Series*

## How to Order

**ZP2V – A5 – 03**

**Connection size (Pad side/Vacuum generator side)**

**Male thread/Female thread**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | Male thread | Female thread | 0.3 | 0.5 | 0.7 | 1.0 | Female thread |
| **A5** | M5 x 0.8 | | ○ | ○ | ○ | — |  |
| **A8** | M8 x 1.25 | | — | ○ | ○ | ○ | |
| **A01** | R1/8 | Rc1/8 | — | ○ | ○ | ○ | |
| **AG1** | G1/8 | | — | ○ | ○ | ○ | Male thread |
| **AN1** | NPT1/8 | | — | ○ | ○ | ○ | **Pad side** |

**Female thread/Male thread**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | Female thread | Male thread | 0.3 | 0.5 | 0.7 | 1.0 | Male thread |
| **B5** | M5 x 0.8 | | ○ | ○ | ○ | — |  |
| **B6** | M6 x 1 | | ○ | ○ | ○ | — | |
| **B01** | Rc1/8 | R1/8 | — | ○ | ○ | ○ | |
| **BG1** | G1/8 | | — | ○ | ○ | ○ | Female thread |
| **BN1** | NPT1/8 | | — | ○ | ○ | ○ | **Pad side** |

**Male thread/Male thread**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | Male thread | Male thread | 0.3 | 0.5 | 0.7 | 1.0 | Male thread |
| **A5A5** | M5 x 0.8 | | ○ | ○ | ○ | — |  |
| **A01A01** | R1/8 | | — | ○ | ○ | ○ | |
| **AG1AG1** | G1/8 | | — | ○ | ○ | ○ | Male thread |
| | | | | | | | **Pad side** |

**Female thread/Female thread**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | Female thread | Female thread | 0.3 | 0.5 | 0.7 | 1.0 | Female thread |
| **B5B5** | M5 x 0.8 | | ○ | ○ | ○ | — |  |
| **B01B01** | Rc1/8 | | — | ○ | ○ | ○ | |
| **BG1BG1** | G1/8 | | — | ○ | ○ | ○ | Female thread |
| | | | | | | | **Pad side** |

**Fixed orifice size**

| Symbol | Fixed orifice size [mm] |
|---|---|
| **03** | 0.3 |
| **05** | 0.5 |
| **07** | 0.7 |
| **10** | 1.0 |

**Male thread/One-touch fitting**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | Male thread | One-touch fitting | 0.3 | 0.5 | 0.7 | 1.0 | One-touch fitting |
| **A5W4** | M5 x 0.8 | ø4 | ○ | ○ | ○ | — |  |
| **A01W6** | R1/8 | ø6 | — | ○ | ○ | ○ | |
| **AG1W6** | G1/8 | ø6 | — | ○ | ○ | ○ | Male thread |
| | | | | | | | **Pad side** |

**Female thread/One-touch fitting**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | Female thread | One-touch fitting | 0.3 | 0.5 | 0.7 | 1.0 | One-touch fitting |
| **B5W4** | M5 x 0.8 | ø4 | ○ | ○ | ○ | — |  |
| **B01W6** | Rc1/8 | ø6 | — | ○ | ○ | ○ | |
| **BG1W6** | G1/8 | ø6 | — | ○ | ○ | ○ | Female thread |
| | | | | | | | **Pad side** |

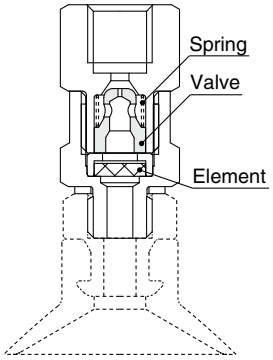
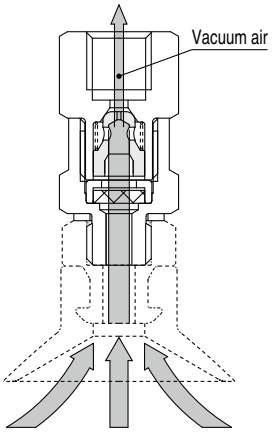
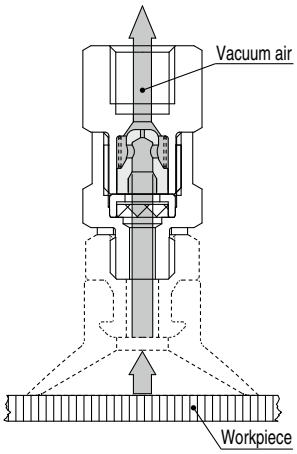
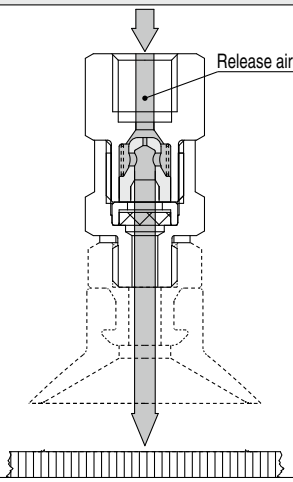
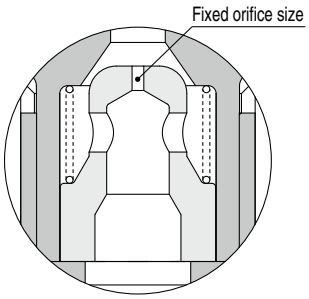
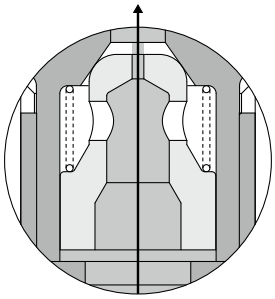
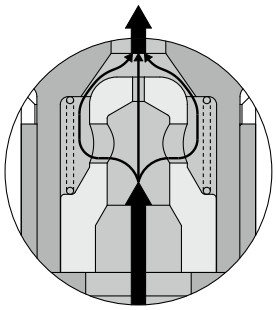
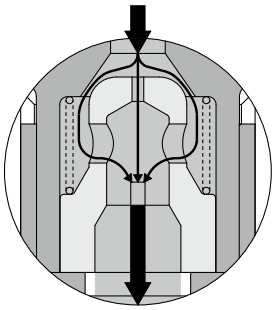
**One-touch fitting/One-touch fitting**

| Symbol | Pad side | Vacuum generator side | Applicable fixed orifice size | | | | Vacuum generator side |
|---|---|---|---|---|---|---|---|
| | One-touch fitting | One-touch fitting | 0.3 | 0.5 | 0.7 | 1.0 | One-touch fitting |
| **W4** | ø4 | | ○ | ○ | ○ | — |  |
| **W6** | ø6 | | — | ○ | ○ | ○ | |
| | | | | | | | One-touch fitting |
| | | | | | | | **Pad side** |

## Specifications

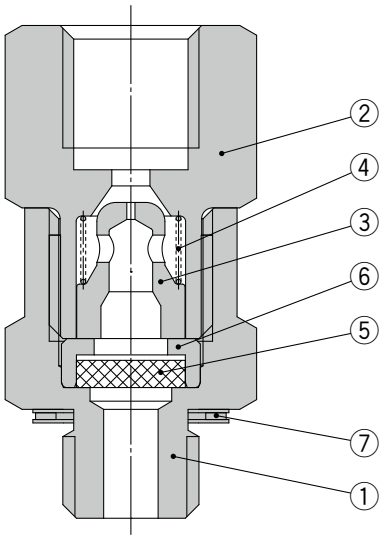
| **Connection size for pad side** | | M5, M6, ø4 | | | M8, R1/8, Rc1/8, G1/8, NPT1/8, ø6 | | |
|---|---|---|---|---|---|---|---|
| **Fixed orifice size [mm]** | | 0.3 | 0.5 | 0.7 | 0.5 | 0.7 | 1.0 |
| **Effective area** | When the valve is operating [mm²] | 0.07 | 0.19 | 0.38 | 0.19 | 0.38 | 0.78 |
| | When the valve is not operating [mm²] | 1.64 | 1.76 | 1.95 | 1.76 | 2.64 | 3.04 |
| **Fluid** | | Air | | | | | |
| **Max. operating pressure range [MPa]** | | 0 to 0.7 | | | | | |
| **Max. operating vacuum pressure range [kPa]** | | 0 to –100 | | | | | |
| **Ambient and fluid temperatures [°C]** | | 5 to 60 (No freezing) | | | | | |
| **Element nominal filtration rating [μm]** | | 40 | | | | | |
| **Min. operating flow rate [L/min (ANR)]** | | 3 | 5 | 8 | 5 | 8 | 16 |

## Working Principle

| | Initial condition | When a workpiece is adsorbed | | When a workpiece is released |
|---|---|---|---|---|
| | | Without workpiece | With workpiece | |
| Air flow |  |  |  |  |
| Valve operating condition |  |  |  |  |
| | Since there is no air flow, the valve remains open by the spring force. | **Valve closed**<br>When the workpiece is separated from the vacuum pad, the valve is closed by the air flow, and the suction air can only flow through the fixed orifice. At this time, an amount of air corresponding to the fixed orifice size is sucked. | **Valve open**<br>When the workpiece is adsorbed by the vacuum pad, the suction flow reduces, and the valve is open by the spring force, which opens the path between the valve and the body for suction. | **Valve open**<br>When the workpiece is released, the valve is open by the vacuum release air, and the path between the valve and the body will open. |

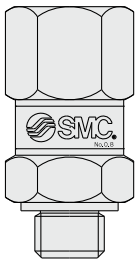
## Construction

**Vacuum generator side**




**Pad side**

**Vacuum generator side**



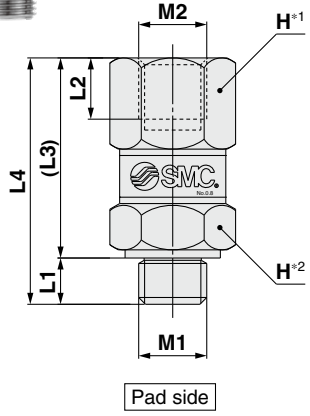
**Pad side**

* For the mounting direction of the product, refer to page 352.

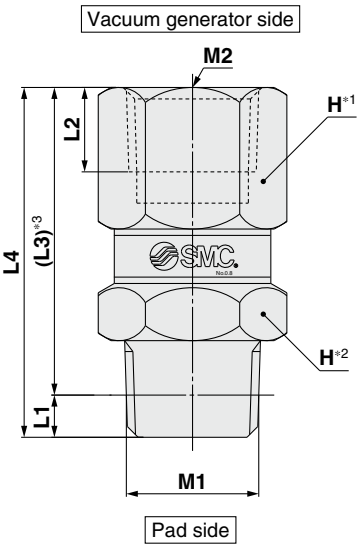
**Component Parts**

| No. | Description | Material |
|---|---|---|
| 1 | **Body A** | Brass (Electroless nickel plating) |
| 2 | **Body B** | Brass (Electroless nickel plating) |
| 3 | **Valve** | Synthetic resin |
| 4 | **Spring** | Stainless steel |
| 5 | **Element** | CAC403 equivalent |
| 6 | **Ring** | Aluminum alloy |
| 7 | **Gasket** | Stainless steel/NBR |

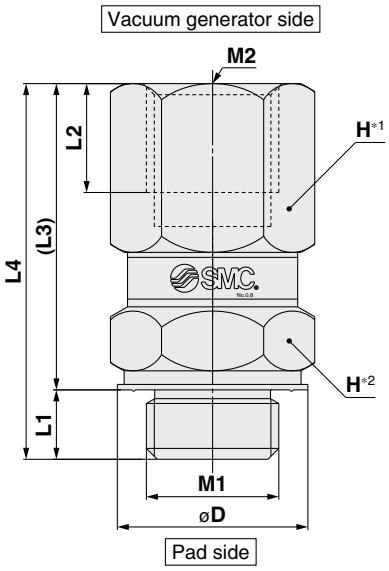
## Dimensions



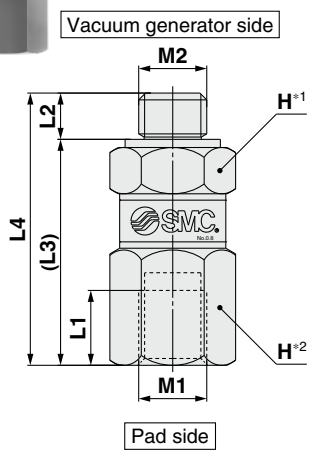

**ZP2V-A5-□**
**ZP2V-A8-□**



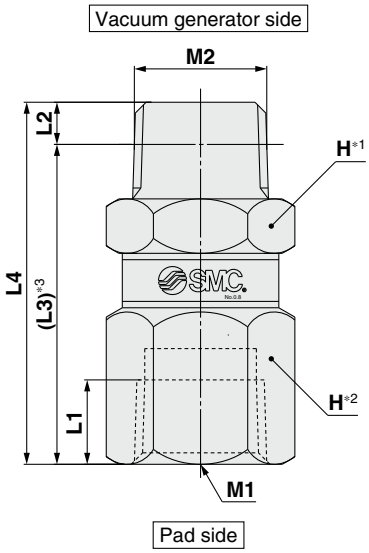

**ZP2V-A01-□**
**ZP2V-AN1-□**



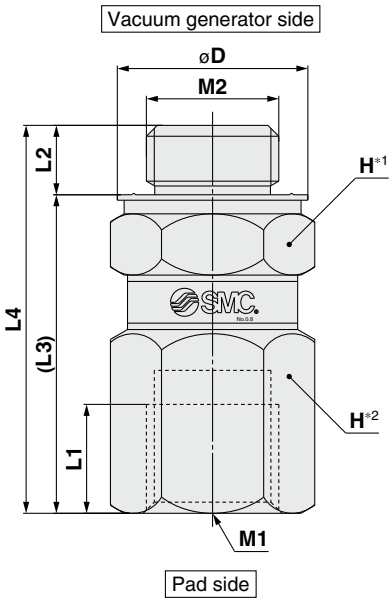

**ZP2V-AG1-□**




**ZP2V-B5-□**
**ZP2V-B6-□**




**ZP2V-B01-□**
**ZP2V-BN1-□**




**ZP2V-BG1-□**

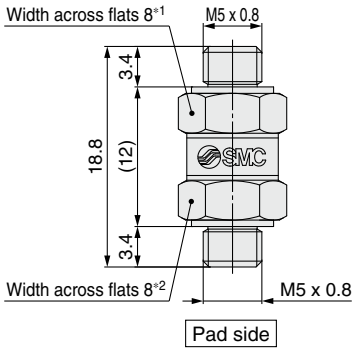
∗1 The place at the vacuum generator side where the tool is used
∗2 The place at the pad side where the tool is used
∗3 The reference dimension after the R or NPT thread is screwed

[mm]

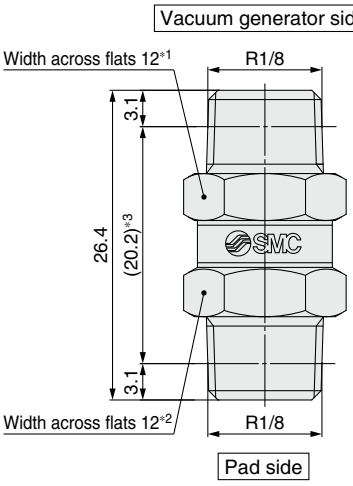
| Model | M1 | M2 | L1 | L2 | L3 | L4 | H (Width across flats) | øD | W [g] | Tightening torque [N·m]∗1 |
|---|---|---|---|---|---|---|---|---|---|---|
| **ZP2V-A5-□** | M5 x 0.8 | M5 x 0.8 | 3.4 | 4.5 | 14.7 | 18.1 | 8 | — | 6 | 1.0 to 1.5 |
| **ZP2V-A8-□** | M8 x 1.25 | M8 x 1.25 | 5.9 | 8 | 20.1 | 26 | 12 | — | 18 | 5.5 to 6.0 |
| **ZP2V-A01-□** | R1/8 | Rc1/8 | 3.1 | 6.2 | 22.6 | 25.7 | 12 | — | 18 | 7.0 to 9.0 |
| **ZP2V-AG1-□** | G1/8 | G1/8 | 5.1 | 8 | 22.5 | 27.6 | 13 | 14 | 23 | 5.5 to 6.0 |
| **ZP2V-AN1-□** | NPT1/8 | NPT1/8 | 3.2 | 6.9 | 23.3 | 26.5 | 12 | — | 19 | 7.0 to 9.0 |
| **ZP2V-B5-□** | M5 x 0.8 | M5 x 0.8 | 5.5 | 3.4 | 16.6 | 20 | 8 | — | 7 | 1.0 to 1.5 |
| **ZP2V-B6-□** | M6 x 1 | M6 x 1 | 5 | 4.5 | 16.2 | 21.5 | 8 | — | 7 | 2.0 to 2.5 |
| **ZP2V-B01-□** | Rc1/8 | R1/8 | 6.2 | 3.1 | 23.5 | 27.1 | 12 | — | 19 | 7.0 to 9.0 |
| **ZP2V-BG1-□** | G1/8 | G1/8 | 8 | 5.1 | 23.4 | 29.0 | 13 | 14 | 24 | 5.5 to 6.0 |
| **ZP2V-BN1-□** | NPT1/8 | NPT1/8 | 6.9 | 3.2 | 24.2 | 27.9 | 12 | — | 19 | 7.0 to 9.0 |

∗1 When mounting and/or removing the product, use a wrench or torque wrench in the place shown in the figures.
When mounting the product, tighten to the torque specified in the table.

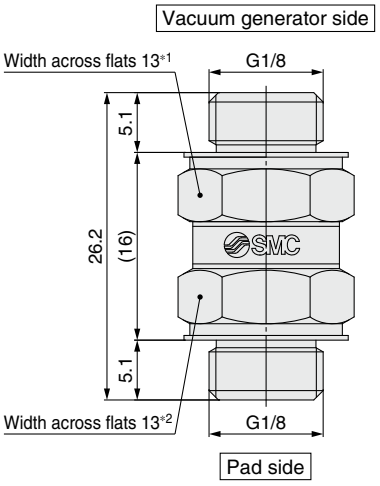
## Dimensions



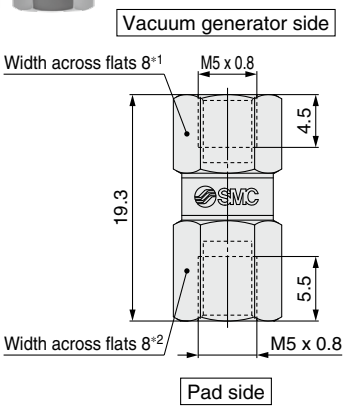

**ZP2V-A5A5-□**



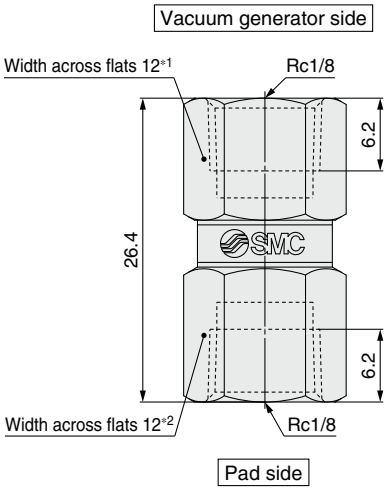

**ZP2V-A01A01-□**



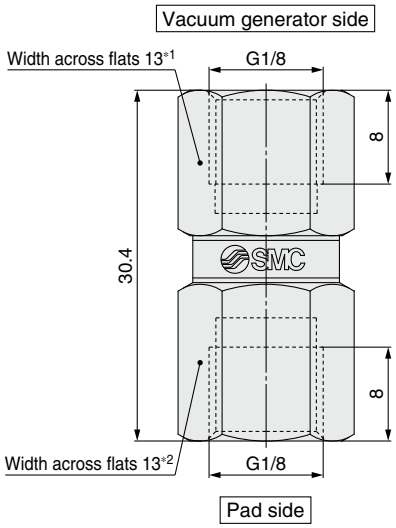

**ZP2V-AG1AG1-□**




**ZP2V-B5B5-□**




**ZP2V-B01B01-□**




**ZP2V-BG1BG1-□**

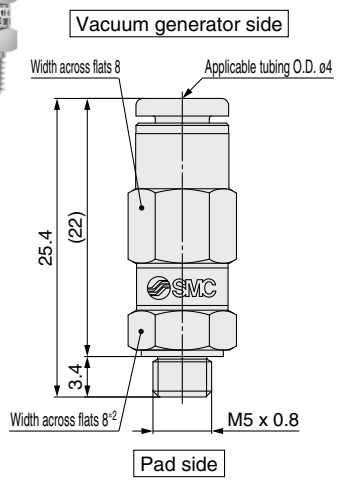
*1 The place at the vacuum generator side where the tool is used
*2 The place at the pad side where the tool is used
*3 The reference dimension after the R thread is screwed

[mm]

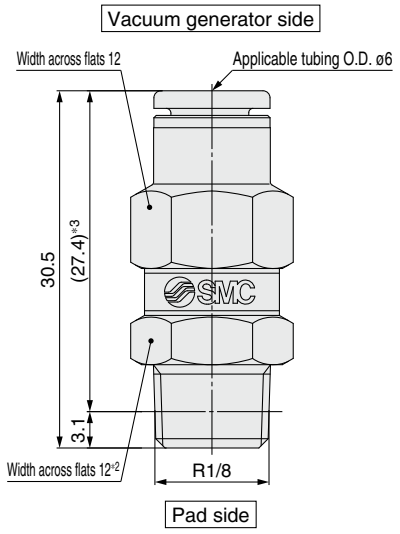
| Model | Connection thread size | | W [g] | Tightening torque [N·m] *1 |
|---|---|---|---|---|
| | Pad side | Vacuum generator side | | |
| **ZP2V-A5A5-□** | M5 x 0.8 | M5 x 0.8 | 6 | 1.0 to 1.5 |
| **ZP2V-A01A01-□** | R1/8 | R1/8 | 19 | 7.0 to 9.0 |
| **ZP2V-AG1AG1-□** | G1/8 | G1/8 | 22 | 5.5 to 6.0 |
| **ZP2V-B5B5-□** | M5 x 0.8 | M5 x 0.8 | 7 | 1.0 to 1.5 |
| **ZP2V-B01B01-□** | Rc1/8 | Rc1/8 | 17 | 7.0 to 9.0 |
| **ZP2V-BG1BG1-□** | G1/8 | G1/8 | 24 | 5.5 to 6.0 |

*1 When mounting and/or removing the product, use a wrench or torque wrench in the place shown in the figures.
When mounting the product, tighten to the torque specified in the table.

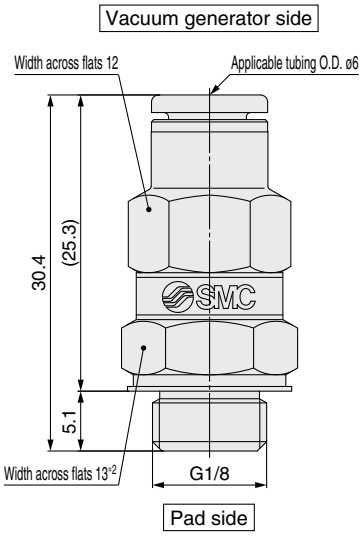
## Dimensions



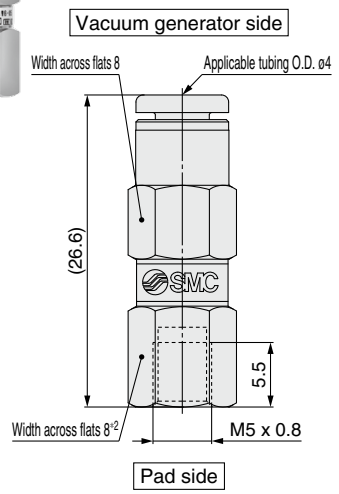

**ZP2V-A5W4-□**



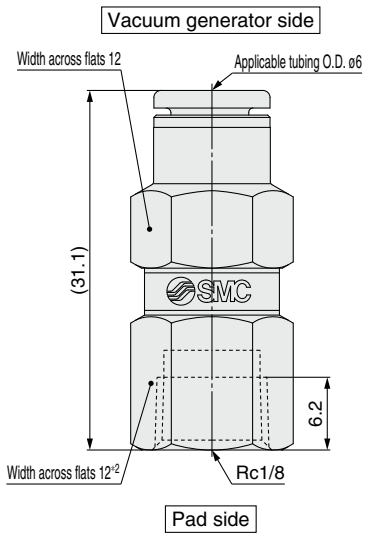

**ZP2V-A01W6-□**



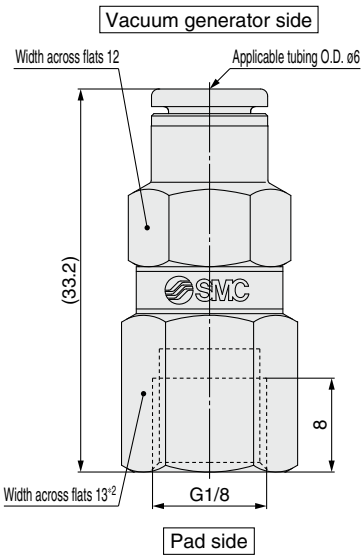

**ZP2V-AG1W6-□**




**ZP2V-B5W4-□**




**ZP2V-B01W6-□**




**ZP2V-BG1W6-□**

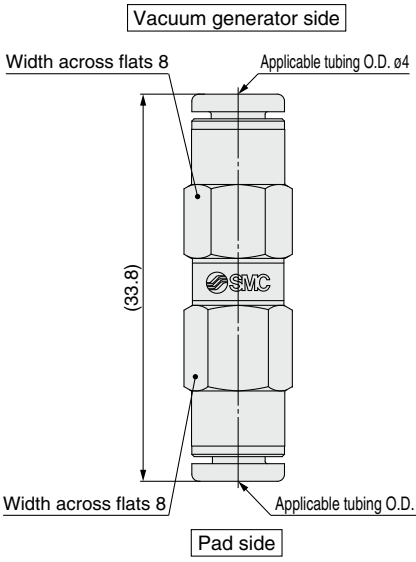
[mm]

| Model | Connection thread size | | W [g] | Tightening torque [N·m] *1 |
|---|---|---|---|---|
| | Pad side | Vacuum generator side | | |
| **ZP2V-A5W4-□** | M5 x 0.8 | ø4 | 6 | 1.0 to 1.5 |
| **ZP2V-A01W6-□** | R1/8 | ø6 | 18 | 7.0 to 9.0 |
| **ZP2V-AG1W6-□** | G1/8 | ø6 | 20 | 5.5 to 6.0 |
| **ZP2V-B5W4-□** | M5 x 0.8 | ø4 | 7 | 1.0 to 1.5 |
| **ZP2V-B01W6-□** | Rc1/8 | ø6 | 17 | 7.0 to 9.0 |
| **ZP2V-BG1W6-□** | G1/8 | ø6 | 21 | 5.5 to 6.0 |

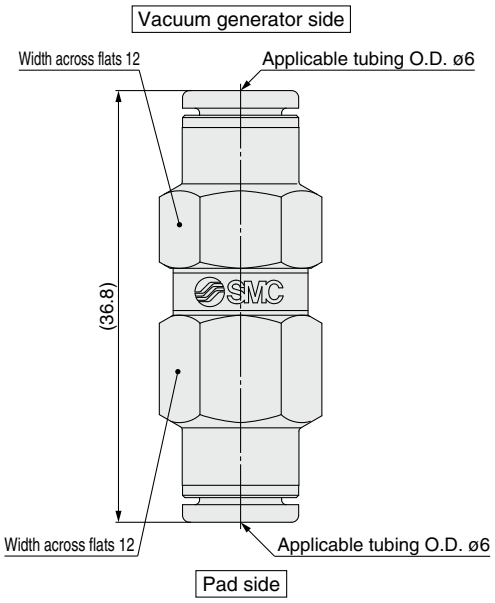
*1 When mounting and/or removing the product, use a wrench or torque wrench in the place shown in the figures.
When mounting the product, tighten to the torque specified in the table.

*1 The place at the vacuum generator side where the tool is used
*2 The place at the pad side where the tool is used
*3 The reference dimension after the R thread is screwed

## Dimensions




**ZP2V-W4-□**




**ZP2V-W6-□**

[mm]

| Model | Connection thread size | | **W** |
|---|---|---|---|
| | Pad side | Vacuum generator side | [g] |
| **ZP2V-W4-□** | ø4 | ø4 | 7 |
| **ZP2V-W6-□** | ø6 | ø6 | 19 |