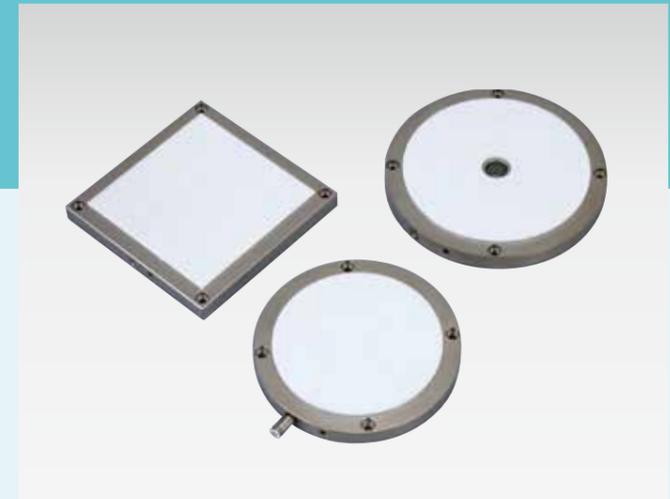


# Precision Suction Plate

PVP

■ Precision Components



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Precision Components

LBC

GFM

PVP

FBU2

AFB-RB

Ending

Precision Components

LBC

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PVP

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Ending

## Precision Resin Porous Plate Suctions ultra-thin or soft materials over the entire surface without damaging the workpiece or causing distortion/deformation.

### High-precision workpiece processing

Suction surface flatness: 2 μm, parallelism: 5 μm.  
(Specification values for R-36-18, C-50, S-50-50)  
High workpiece fixing accuracy enables high-precision workpiece processing.

Parallelism : 5 μm

Flatness : 2 μm

### Large Suction Force

Porosity is 40%, enabling full-surface suction with large suction force. Even with large suction force, there is no suction deformation of ultra-thin workpieces.

Porosity : 40%



### Does Not Damage Workpiece

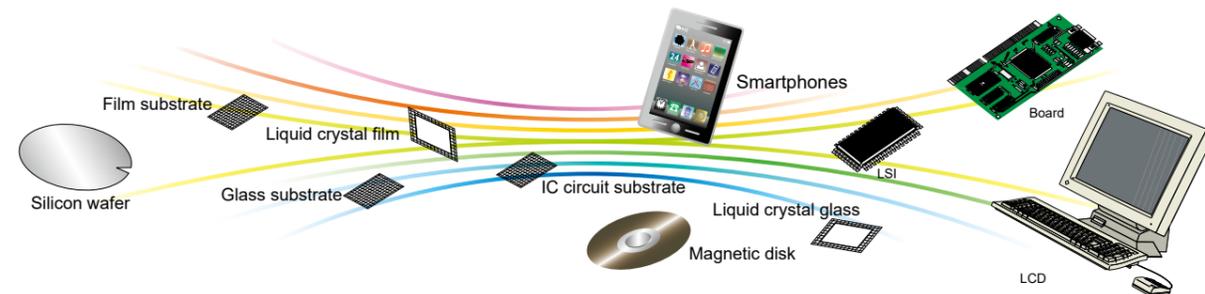
Suction surface hardness is Shore D60. Soft contact does not damage the workpiece.

Hardness: Shore D60

### Lightweight

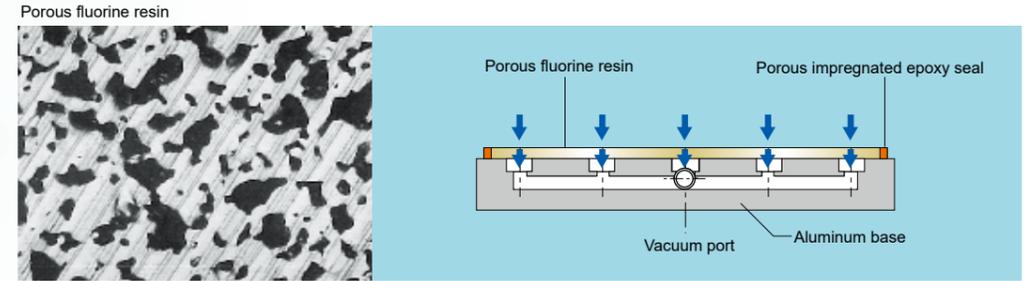
Porous fluorine resin (apparent specific gravity: 1.3) and aluminum base (specific gravity: 2.7). Being lightweight allows for smaller drive force.

Specific gravity: 2.7 or less



### Porous Material Principle

Evacuates from the vacuum port and suctions from the entire surface of the fluororesin porous material.



### Series Variations

Plate shape is available in 3 standard types. Furthermore, we customize to the desired shape according to customer requests.

Standard

#### PVP-R

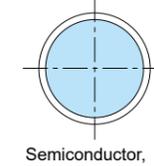
(1) Donut shaped



Disc, etc.

#### PVP-C

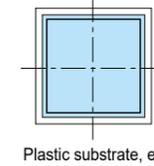
(2) Round shape



Semiconductor, silicon wafer, etc.

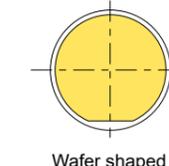
#### PVP-S

(3) Square shape

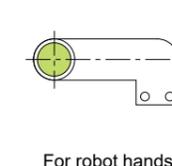


Plastic substrate, etc.

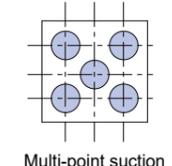
Example of shape Special Specification Product



Wafer shaped



For robot hands



Multi-point suction

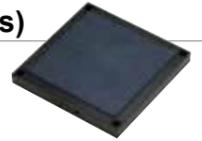
\* Accepted as a special specification product. For details, please contact our sales department.

### Antistatic (option)

Antistatic agent coated on the porous fluorine resin plate can prevent static electricity that may damage workpieces.

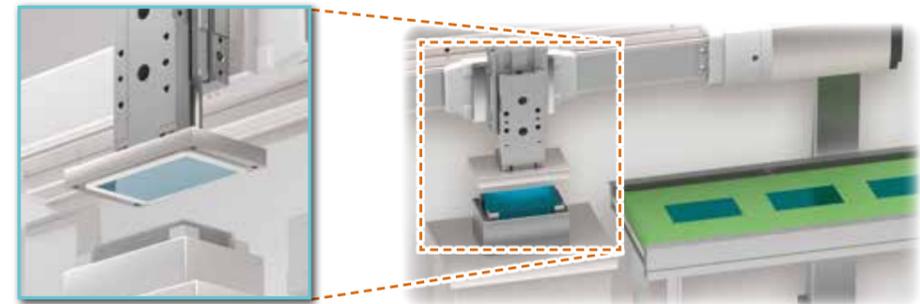
### Black/conductive (PPS porous)

A black series that will not scratch nor cause glare on workpieces is also available.

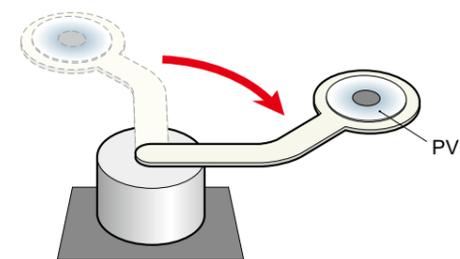


### Application Example

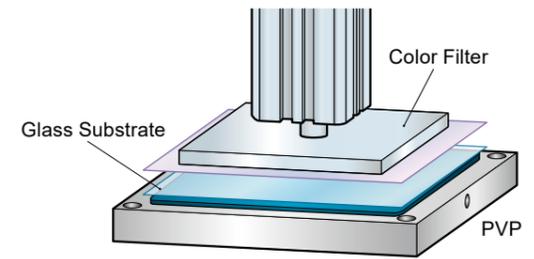
#### Film Substrate Transport

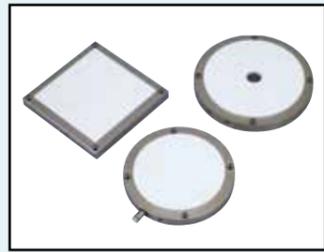


#### Robot Hand/Wafer Transport



#### LCD Glass Lamination Process





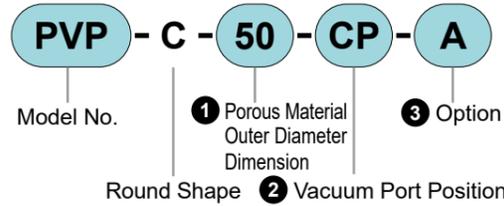
# Precision Suction Plate

## PVP Series



### Model No. Notation

#### Model No. notation of the round adsorption plate



#### ① Porous Material Outer Diameter Dimension

| Code | Content |
|------|---------|
| 50   | 50      |
| 75   | 75      |
| 100  | 100     |
| 113  | 113     |
| 138  | 138     |
| 187  | 187     |

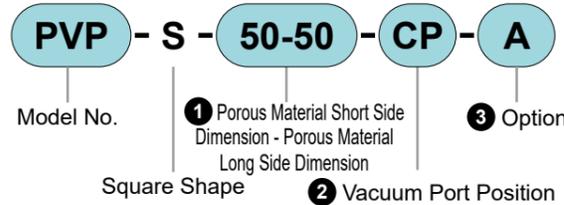
#### ② Vacuum Port Position

| Code  | Content   |
|-------|-----------|
| Blank | Side Port |
| CP    | Back Port |

#### ③ Option

| Code  | Content              |
|-------|----------------------|
| Blank | None                 |
| A     | Antistatic Treatment |

#### How to order the square adsorption plate



#### ① Porous Material Short Side Dimension - Porous Material Long Side Dimension

| Code    | Content |
|---------|---------|
| 50-50   | 50-50   |
| 100-100 | 100-100 |
| 150-150 | 150-150 |
| 200-250 | 200-250 |

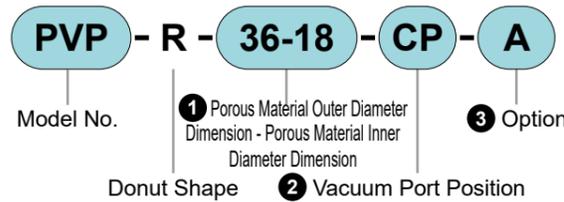
#### ② Vacuum Port Position

| Code  | Content   |
|-------|-----------|
| Blank | Side Port |
| CP    | Back Port |

#### ③ Option

| Code  | Content              |
|-------|----------------------|
| Blank | None                 |
| A     | Antistatic Treatment |

#### How to order the donut shaped suction plate



#### ① Porous Material Outer Diameter Dimension - Porous Material Inner Diameter Dimension

| Code   | Content |
|--------|---------|
| 36-18  | 36-18   |
| 85-27  | 85-27   |
| 118-18 | 118-18  |

#### ② Vacuum Port Position

| Code  | Content   |
|-------|-----------|
| Blank | Side Port |
| CP    | Back Port |

#### ③ Option

| Code  | Content              |
|-------|----------------------|
| Blank | None                 |
| A     | Antistatic Treatment |

### Specifications

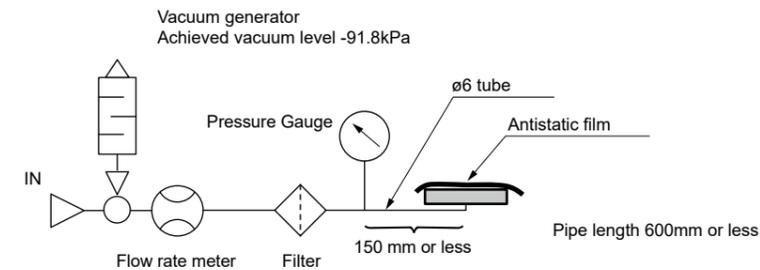
| Item                 | PVP-R-36-18         | PVP-R-85-27<br>PVP-R-118-18<br>PVP-C-75<br>PVP-C-100<br>PVP-C-113<br>PVP-C-138<br>PVP-S-100-100 | PVP-C-50                           | PVP-C-187               |     |
|----------------------|---------------------|---|------------------------------------|-------------------------|-----|
|                      | PVP-S-50-50         | PVP-S-150-150<br>PVP-S-200-250  |                                    |                         |     |
| Product              | Suction Surface     | Flatness  | 2                                  | 3                       |     |
|                      |                     | Parallelism   | 5                                  | 10                      |     |
|                      |                     | Reference Surface Flatness  | 10                                 | 10                      |     |
|                      |                     | Air Leakage Amount  | L/min (ANR)                        | 0.4                     | 0.6 |
|                      |                     | Vacuum Differential Pressure  | kPa(*2)                            | 40 or more              | 1   |
|                      |                     | Applied Operating Pressure  | MPa                                | 0.2 or less (Clean Air) |     |
| Porous Material Part | Ambient Temperature | °C  | 5 to 40                            |                         |     |
|                      | Ambient Humidity    | %RH(*3)   | 65 or less                         |                         |     |
|                      | Material            |   | Polychlorotrifluoroethylene resin  |                         |     |
| Base Part            | Porosity            | %   | 40±5                               |                         |     |
|                      | Shore D Hardness    | Degrees   | 60±15                              |                         |     |
| Base Part            | Material            |   | Corrosion Resistant Aluminum Alloy |                         |     |
|                      | Surface Treatment   | (*4)  | None                               |                         |     |

\*1: This accuracy is the measured value when left for 24 hours in a constant temperature room at 23°C. In temperature atmospheres deviating from 23°C, accuracy changes and may deviate from specification values. The measurement method involves measuring the straightness (in 2 or more directions) when the product is placed unloaded on a surface plate, and the maximum value is specified. Although this is not the original method for measuring flatness, this measurement method is used due to the depressions in the porous material.

\*2: Represents the pressure drop value of the vacuum source when the workpiece is vacuum-suctioned over the entire porous surface.

\*3: In humidity atmospheres exceeding 65% RH, suction surface accuracy may deteriorate and deviate from specification values.

\*4: The body material of this product is raw corrosion-resistant aluminum alloy. If surface treatment (alumite treatment, electroless nickel plating, etc.) is specified, it will be handled as custom.



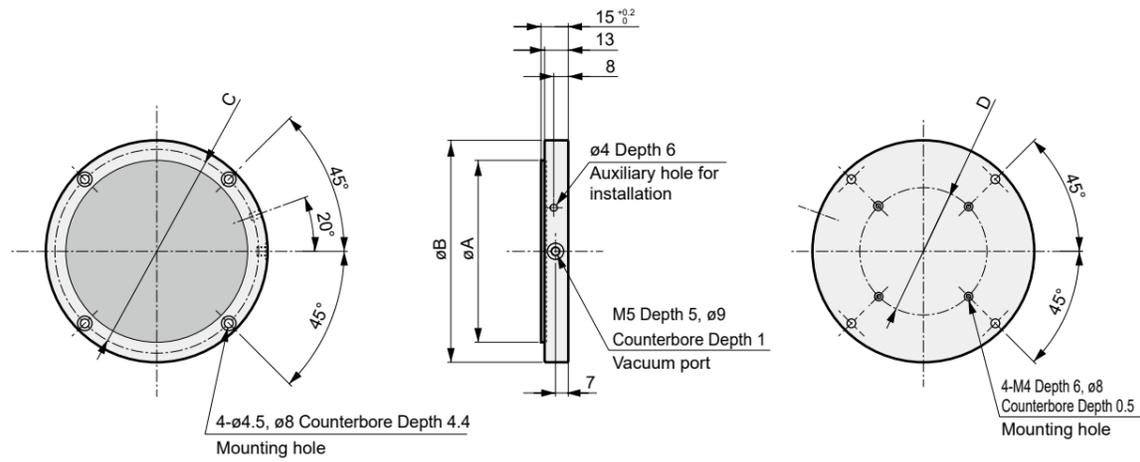
(Fig. 1) Inspection circuit diagram

### Suction Area/Weight Table

| Model No.     | Suction Area (cm <sup>2</sup> ) | Weight (g) |
|---------------|---------------------------------|------------|
| PVP-R-36-18   | 8                               | 80         |
| PVP-R-85-27   | 51                              | 290        |
| PVP-R-118-18  | 107                             | 520        |
| PVP-C-50      | 20                              | 140        |
| PVP-C-75      | 44                              | 250        |
| PVP-C-100     | 79                              | 390        |
| PVP-C-113     | 100                             | 490        |
| PVP-C-138     | 149                             | 680        |
| PVP-C-187     | 275                             | 1,170      |
| PVP-S-50-50   | 25                              | 160        |
| PVP-S-100-100 | 100                             | 490        |
| PVP-S-150-150 | 225                             | 980        |
| PVP-S-200-250 | 500                             | 2,030      |

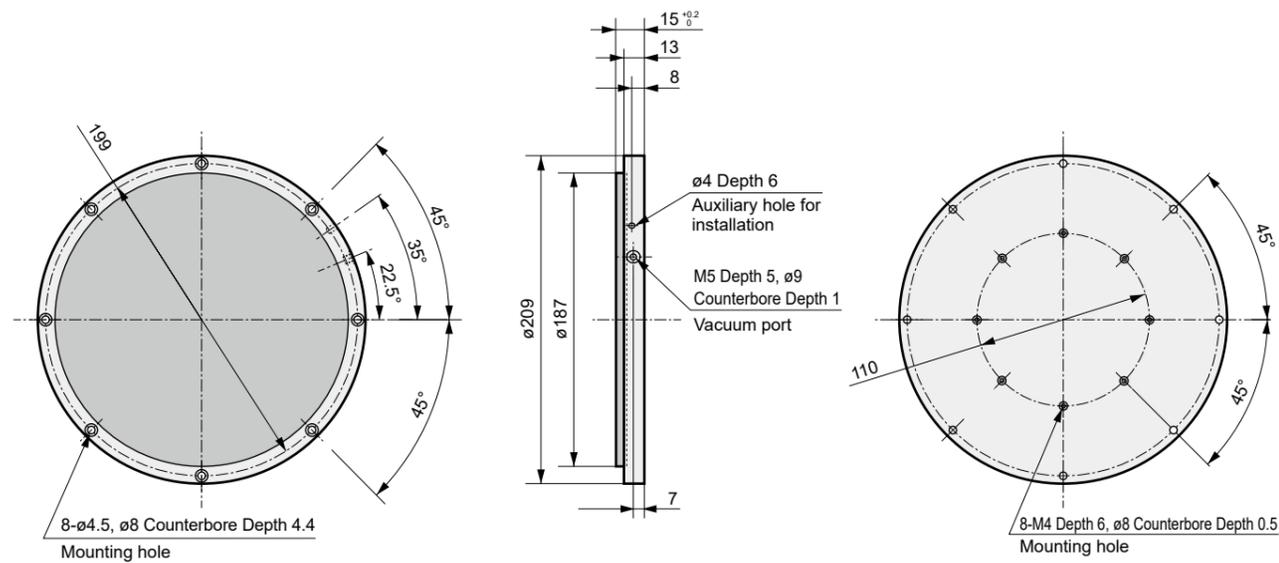
External Dimension Drawings

●PVP-C-□



| Model No. | A   | B   | C   | D  |
|-----------|-----|-----|-----|----|
| PVP-C-50  | 50  | 72  | 62  | 30 |
| PVP-C-75  | 75  | 97  | 87  | 50 |
| PVP-C-100 | 100 | 122 | 112 | 70 |
| PVP-C-113 | 113 | 135 | 125 | 70 |
| PVP-C-138 | 138 | 160 | 150 | 90 |

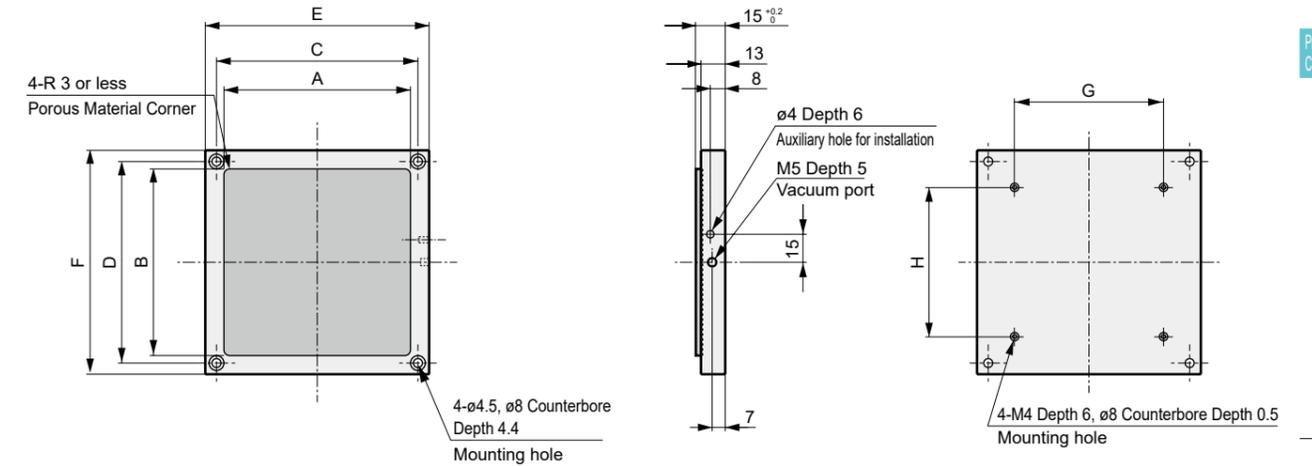
●PVP-C-187



External Dimension Drawings

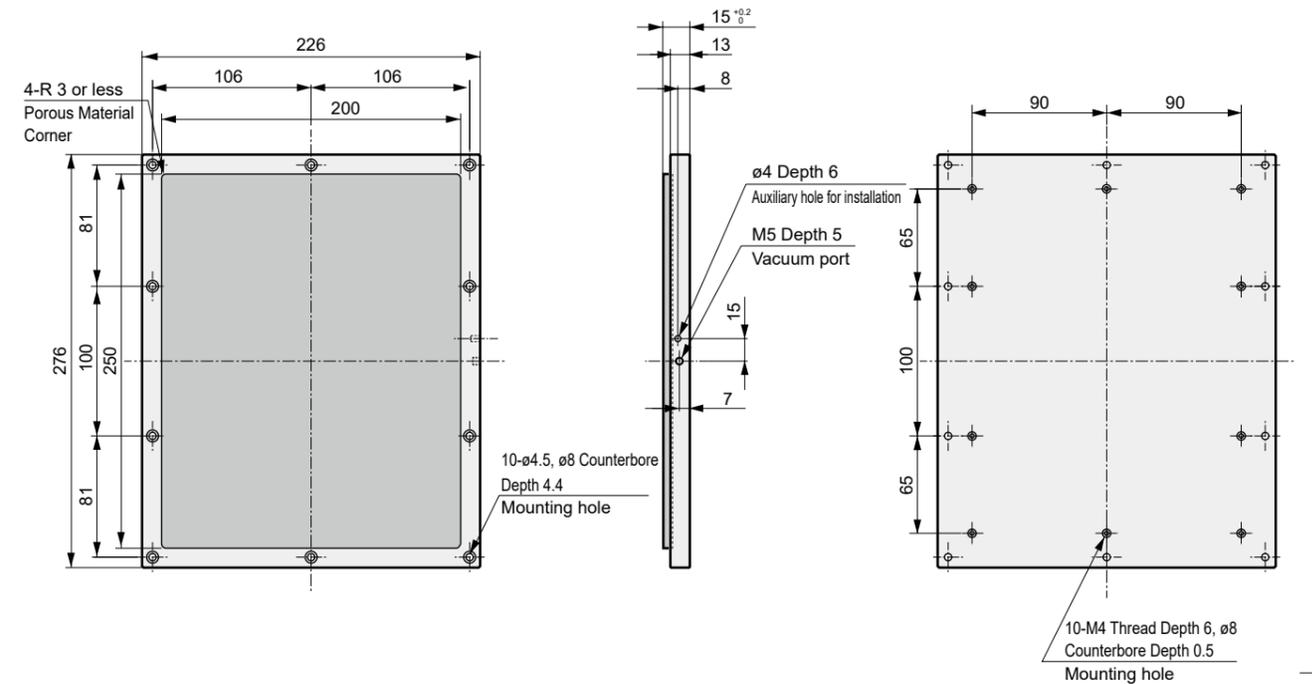
External Dimension Drawings

●PVP-S-□



| Model No.     | A   | B   | C   | D   | E   | F   | G   | H   |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|
| PVP-S-50-50   | 50  | 50  | 58  | 58  | 70  | 70  | 40  | 40  |
| PVP-S-100-100 | 100 | 100 | 108 | 108 | 120 | 120 | 80  | 80  |
| PVP-S-150-150 | 150 | 150 | 158 | 158 | 170 | 170 | 120 | 120 |

●PVP-S-200-250



Precision Components

Precision Components

LBC

LBC

GFM

GFM

PVP

PVP

FBU2

FBU2

AFB-RB

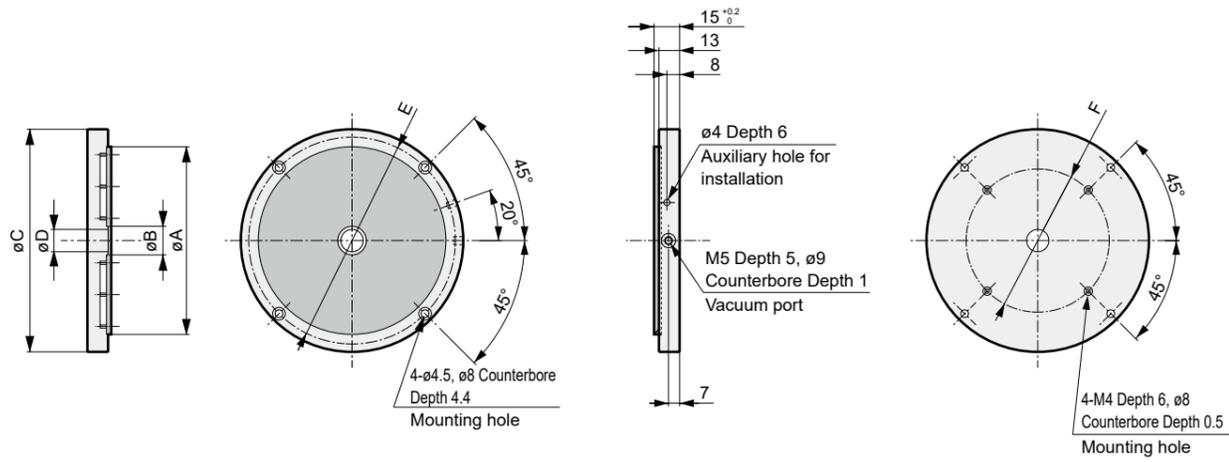
AFB-RB

Ending

Ending

External Dimension Drawings

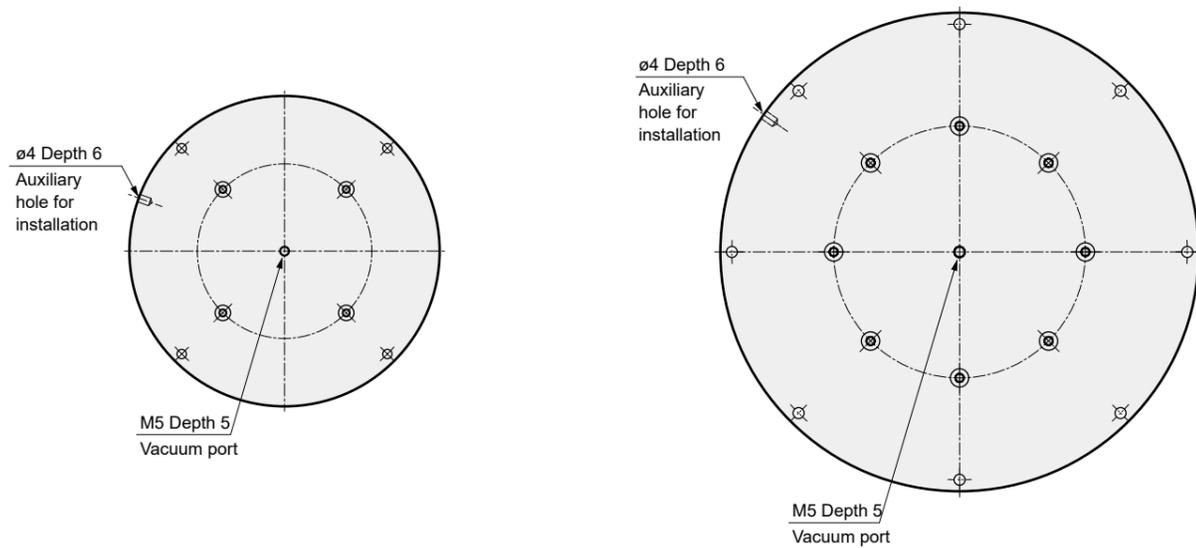
●PVP-R-□



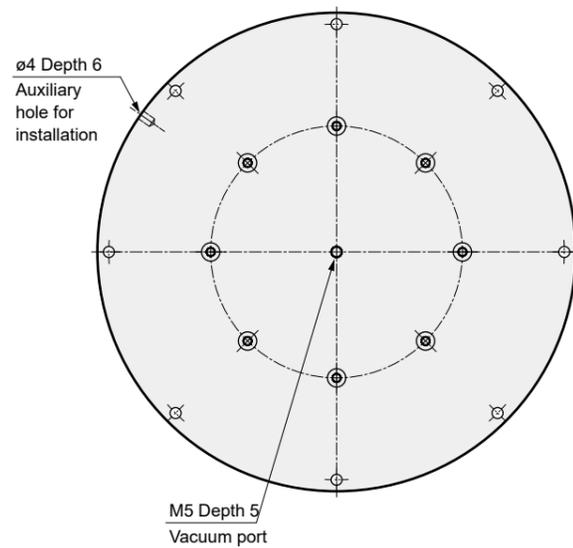
| Model No.    | A   | B  | C   | D  | E   | F  |
|--------------|-----|----|-----|----|-----|----|
| PVP-R-36-18  | 36  | 18 | 58  | 16 | 48  | 30 |
| PVP-R-85-27  | 85  | 27 | 107 | 25 | 97  | 60 |
| PVP-R-118-18 | 118 | 18 | 140 | 16 | 130 | 90 |

Vacuum Port Position Back Port (CP)

●PVP-C-□



●PVP-C-187

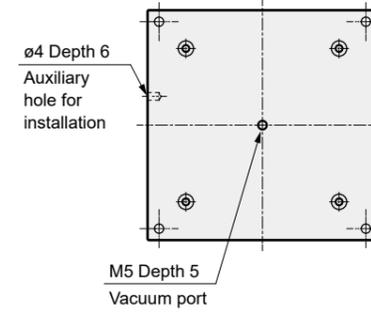


External Dimension Drawings

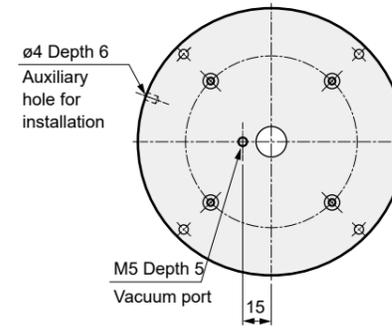
External Dimension Drawings

Vacuum Port Position Back Port (CP)

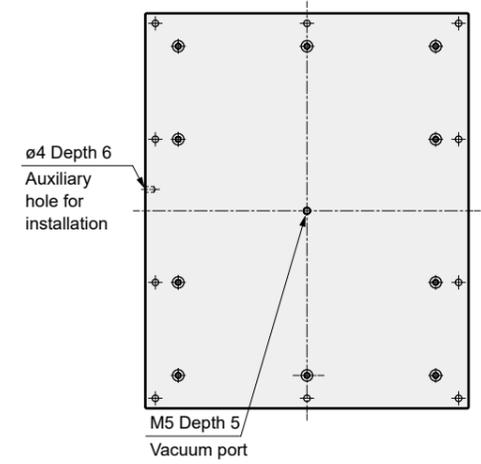
●PVP-S-□



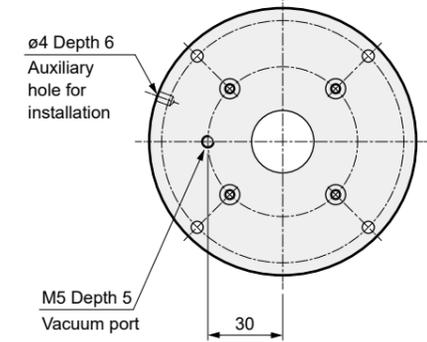
●PVP-R-□-18

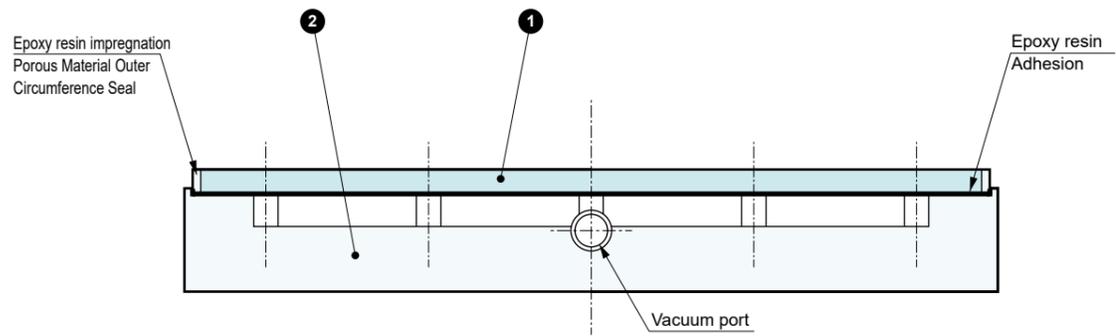


●PVP-S-200-250



●PVP-R-85-27

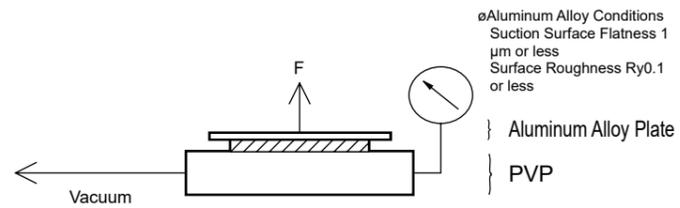
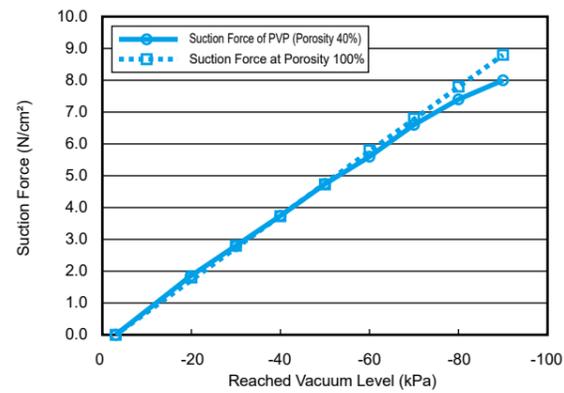




| Part No. | Part Name       | Material                           |
|----------|-----------------|------------------------------------|
| 1        | Porous Material | Polychlorotrifluoroethylene resin  |
| 2        | Base            | Corrosion Resistant Aluminum Alloy |

Technical Data

● Vertical suction(reference data)



This data is reference data measured with the above(PVP-S-50-50). The lower limit of the vacuum level reached is not zero because there is piping resistance due to the porous material and piping. Other than the above, suction force may change depending on piping resistance, shape of the object being suctioned, surface roughness, etc.

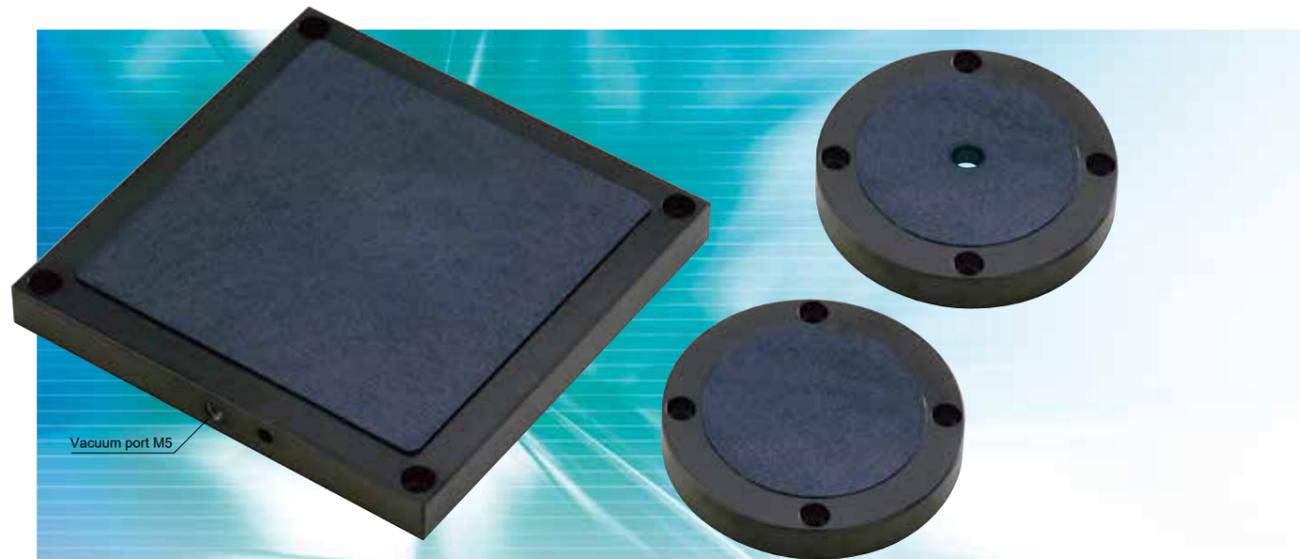
Aluminum Alloy Conditions  
 Suction Surface Flatness 1 μm or less  
 Surface Roughness Ry0.1 or less  
 Aluminum Alloy Plate  
 PVP

# Precise suction plate (black) PVP-B Series

Available as a Special Specification Product.  
For details, please contact our sales department.

**Special Specification Product**

## No more scratches, no more glare. The long-awaited black suction plate!



### Black porous plate

#### No glare

The black color does not reflect light and thus enables the inspection processes that are not possible with a conventional white porous plate.

### Conductive resin

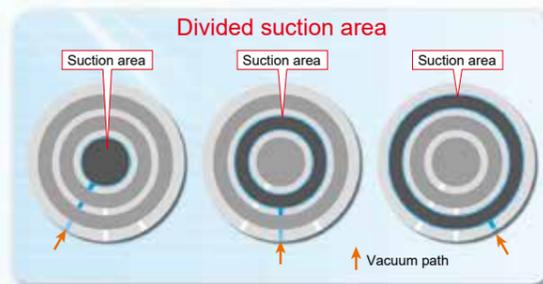
#### Soft touch on workpiece

The conductive resin suction plate does not generate static electricity nor damage a workpiece during suctioning.

### Dividable suction area (Example of customization)

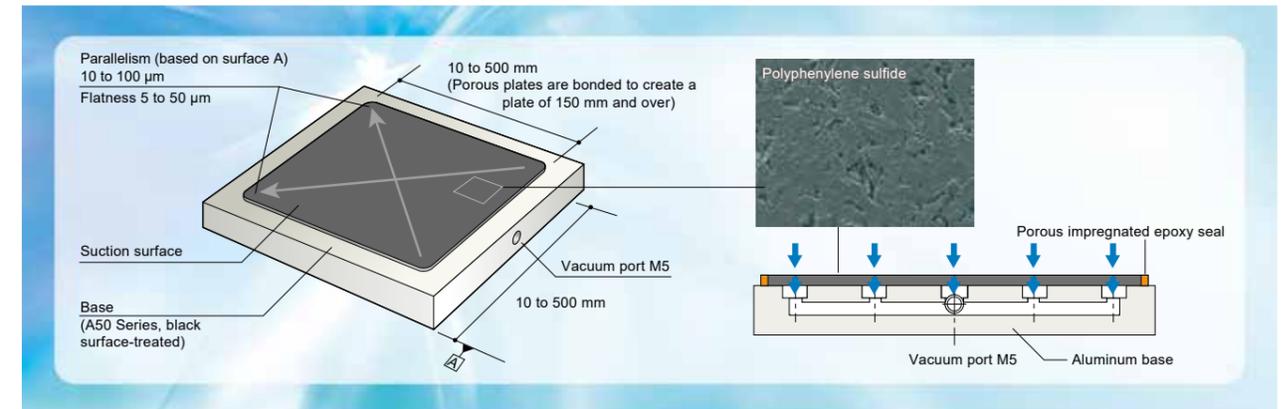
The suction area can be divided to handle various kinds of workpiece

The optimum section of the divided PVP suction area can be used according to the workpiece.



Porosity 40% and flatness 5 μm/10 mm.

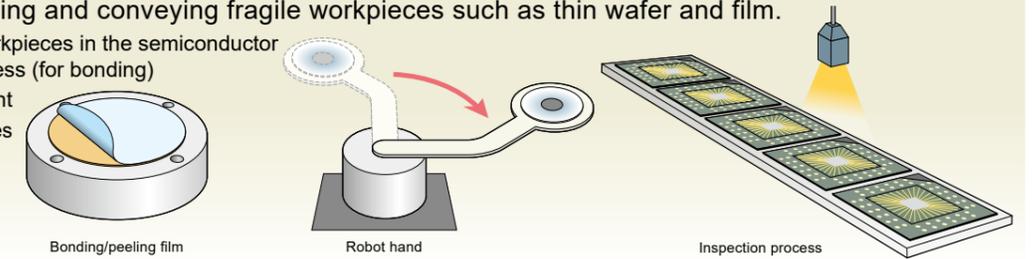
Shore D100 suction surface hardness without damaging workpieces is suitable for various applications.



### Applications of PVP

Perfect for suctioning and conveying fragile workpieces such as thin wafer and film.

- ◆ Suctioning to fix workpieces in the semiconductor manufacturing process (for bonding)
- ◆ Inspection equipment
- ◆ Conveying workpieces
- ◆ Assembling parts



### Main specifications

|                 |                              |   |              |
|-----------------|------------------------------|---|--------------|
| Product         | Suction surface accuracy     | Flatness  | 5 to 50 μm   |
|                 |                              | Parallelism                                     | 10 to 100 μm |
|                 | Vacuum differential pressure | 40 kPa and over (when vacuum source is -90 kPa) |              |
| Porous material | Material                     | With polyphenylene sulfide (PPS) carbon fiber * |              |
|                 | Porosity                     | 40±5%   |              |
|                 | Hardness (Shore)             | 100 or less                                     |              |
| Base material   | Material                     | Corrosion proof aluminum alloy                  |              |
|                 | Surface treatment            | Black surface-treated                           |              |

\*As carbon fiber is exposed on the surface, powder may adhere to the workpiece, due to the dirt or dust produced when rubbed strongly.



# To Use This Product Safely

Be sure to read this before use.

For general pneumatic components precautions, Intro P. 15 for details.

MEMO

## Design / Selection

### Warning

■ If a falling workpiece could pose a hazard in systems that incorporate a precision suction plate, a mechanical drop prevention device must be installed for safety.

■ Do not use in environments with corrosive or flammable gases, and never allow such gases to be suctioned.

■ Consider the behavior at emergency stop.  
If safety devices activate during emergency stop or system abnormality, causing the power source, machinery, etc., to stop, design so as not to cause injury to personnel or damage to workpieces/equipment/devices.

■ Be sure to use the product within the specified range (5 to 40°C, 0.2 MPa or less). The multi-porous layer peels off when used at a pressure or temperature exceeding the specified range. Do not use this product. It may generate corrosive gases.

■ Consider the behavior when restarting after emergency or abnormal stops.  
Design so that restarting does not cause injury to personnel or damage to workpieces/equipment/devices.

### Caution

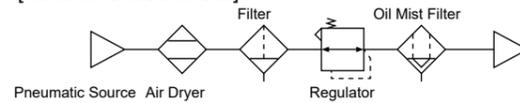
■ Confirm before use that the product will withstand the working environment.  
Environments that cause functional impairment, such as dusty atmospheres, processes that generate dust, chemical atmospheres, chemicals, vibrations, humidity, water droplets, gas atmospheres, ozone-generating environments, etc.

■ Use at an ambient humidity of 65% RH or less. Use outside the specification range may degrade suction surface accuracy.

■ Suction conditions vary with the product, piping, work, and working environment. Select the vacuum generator after sufficiently considering the ultimate vacuum level, suction flow rate, and response time.

■ Use dry, clean compressed air [Class 1.6.2] (solid particles 0.1 μm, pressure dew point 10°C, oil content 0.1 mg/m<sup>3</sup>) when purging with air.  
(The grade is based on the compressed air quality grades according to ISO 8573-1: 2010.)

[Recommended Circuit]



■ Do not use spiral hoses.  
Piping resistance increases, causing problems such as delays in reaching vacuum and reduced suction force.

■ Note the following when connecting more than one precise suction plate to one vacuum generator.  
● If one precise suction plate leaks, vacuum will drop and cause suction errors.

● Piping between the vacuum generator and branch must be bigger than the piping between the branch and suction pad.

■ When using this product in a cold climate, take the necessary measures to prevent freezing.  
Foreign matter or oil in compressed air can clog the porous material, causing failure/malfunction.

■ When there is a heat source in the surroundings, insulate the product.  
The product temperature may rise above the ambient temperature due to radiant heat, so shield it with a cover, etc.

■ Avoid using this product where vibration and impact are present.  
Causes failure/malfunction.

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site(<https://www.ckd.co.jp/kiki/en/>) → 'model No.' → [Instruction Manual](#)

Precision Components

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AFB-RB

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