VACUUM CHUCKS

Model KVR

VACUUM CHUCK

Vacuum system required additionally

An example of fabrication of special type

Features

- The suction holes on the chuck work face can be arranged to set an effective holding area according to shapes of workpieces by combined adjustment of thread valves and valves.
- The suction holes have cross grooves to expand the acting area. Thus, fewer thread valves are used to improve the work efficiency.
- The chuck work face is made of iron to allow self-grinding to recover parallelism.
- Since the chuck work face is made of iron, magnetic devices such as workpiece stoppers can be utilized.
- A special suction hole layout adapter can be installed according to workpieces and work procedures.
- These chucks can be mounted on magnetic chucks.
- Since no heat source or moving parts are used inside the chucks, highly precise machining is ensured.

KVR-D (Thread valve type)

- An effective holding area can be set according to shapes of workpieces by combined adjustment of thread valves and valves.
- Since suction grooves of cross shape are provided on the holding face, the number of thread valves has been reduced to enhance the work efficiency.

KVR-H (Small hole type)

- Holes of φ4 are provided on the holding face at 8-mm pitches.

Application

Chucks to hold workpieces by utilizing atmospheric pressure. Nonferrous and nonmagnetic materials can be held and machined. These chucks are suitable for grinding and cutting plastics and grinding aluminum, brass, stainless steel, ceramic and glass.

PRECAUTIONS FOR USE

The vacuum chuck is of such construction that the inside of the chuck is evacuated by a vacuum pump to reduce the internal pressure and a workpiece is held by atmospheric pressure. Therefore, the holding power is determined by a difference between the internal pressure and atmospheric pressure and the holding area. Due to physical restrictions, a difference in pressure that can be obtained by a pump is about 80 kPa (600 mmHg) in consideration of the upper limit of available evacuation efficiency. Since the same holding power as about 80 kPa (0.8 kgf/cm²) can be obtained, if the holding area of a workpiece is 100 cm², it is held by a holding power of about 800 N (80 kgf). Note, however, that if the holding face of workpieces is rough or distorted, even if slightly, atmospheric pressure leak occurs to decrease the holding power significantly. For such workpieces, some leak preventing measures must be taken. Workpieces could be deformed by heat generated during machining depending on materials and thickness of workpieces. Pay attention to machining methods. In particular, thin stainless steel sheets deform due to machining heat largely and are difficult to hold. If you have questions, please contact us.

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Size</th>
<th>Work Face</th>
<th>Hole Pitch</th>
<th>Mounting Face</th>
<th>Height</th>
<th>Mass</th>
<th>Applicable Vacuum System</th>
</tr>
</thead>
</table>
| KVR-D1018 | 100 × 175 × 175 | 100 × 175 | 85.34 | 145.57 | 19.2 kg | 716% | VPU-E10
| KVR-D1325 | 125 × 250 × 250 | 125 × 250 | 106.41 | 225.86 | 33.5 kg | 716% | VPU-E20
| KVR-D1515 | 150 × 300 × 300 | 150 × 300 | 125.49 | 425.94 | 48.3 kg | 716% | VPU-E20
| KVR-D1530 | 150 × 300 × 300 | 150 × 300 | 125.49 | 425.94 | 72 kg | 716% | VPU-E20
| KVR-D1545 | 150 × 450 × 450 | 150 × 450 | 125.49 | 425.94 | 716% | VPU-E20
| KVR-D2035 | 200 × 350 × 350 | 200 × 350 | 185.72 | 305.12 | 716% | VPU-E20
| KVR-D2050 | 200 × 500 × 500 | 200 × 500 | 185.72 | 305.12 | 716% | VPU-E20
| KVR-D2060 | 300 × 600 × 600 | 300 × 600 | 285.11 | 545.21 | 716% | VPU-E20

* Clamp parts are included.

KVR-H1018

KVR-H1325

KVR-H1515

KVR-H1530

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Size</th>
<th>Work Face</th>
<th>Hole Pitch</th>
<th>Mounting Face</th>
<th>Height</th>
<th>Mass</th>
<th>Applicable Vacuum System</th>
</tr>
</thead>
</table>
| KVR-H1018 | 100 × 175 × 175 | 100 × 175 | 85.34 | 145.57 | 19.2 kg | 716% | VPU-E10
| KVR-H1325 | 125 × 250 × 250 | 125 × 250 | 106.41 | 225.86 | 33.5 kg | 716% | VPU-E20
| KVR-H1515 | 150 × 300 × 300 | 150 × 300 | 125.49 | 425.94 | 48.3 kg | 716% | VPU-E20
| KVR-H1530 | 150 × 300 × 300 | 150 × 300 | 125.49 | 425.94 | 716% | VPU-E20

* Clamp parts are included.
Model **KVR-AV**  AUTO VALVE TYPE VACUUM CHUCK

An epoch-making vacuum chuck that requires no masking!

**Vacuum system required additionally**

![KVR-AV1530](image)

**Patented** (Technical tie-up with Taiyo Tec Company)

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**Table: KVR-AV Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Size</th>
<th>Work Face</th>
<th>Suction Port Pitch</th>
<th>No. of Suction Ports</th>
<th>Mounting Face</th>
<th>Height</th>
<th>Mass</th>
<th>Applicable Vacuum System</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVR-AV1018</td>
<td>100 (3.93) x 175 (6.89)</td>
<td>B1</td>
<td>L1</td>
<td>Be</td>
<td>Le</td>
<td>P1</td>
<td>P2</td>
<td>11.5 (0.45)</td>
</tr>
<tr>
<td>KVR-AV1530</td>
<td>150 (5.90) x 300 (11.8)</td>
<td>150 (5.90) x 300 (11.8)</td>
<td>150 (5.90) x 300 (11.8)</td>
<td>300 (11.8)</td>
<td>96 (3.77)</td>
<td>240 (9.45)</td>
<td>188</td>
<td>146 (5.75)</td>
</tr>
<tr>
<td>KVR-AV2040</td>
<td>200 (7.87) x 400 (15.7)</td>
<td>200 (7.87) x 400 (15.7)</td>
<td>200 (7.87) x 400 (15.7)</td>
<td>400 (15.7)</td>
<td>144 (5.69)</td>
<td>348 (13.7)</td>
<td>388</td>
<td>196 (7.71)</td>
</tr>
<tr>
<td>KVR-AV3060</td>
<td>300 (11.8) x 600 (23.6)</td>
<td>300 (11.8) x 600 (23.6)</td>
<td>300 (11.8) x 600 (23.6)</td>
<td>600 (23.6)</td>
<td>228 (8.97)</td>
<td>540 (21.2)</td>
<td>908</td>
<td>256 (11.16)</td>
</tr>
</tbody>
</table>

*KVR-AV1530, KVR-AV2040 and KVR-AV3060 have places where no suction ports are provided. 2. Clamp ports are included.

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Model **VPU-E-AV**  VACUUM SYSTEM DEDICATED TO AUTO VALVE TYPE VACUUM CHUCK

**Dry/wet operations**

**[Application]**
A vacuum system dedicated to the auto valve type vacuum chucks. The chuck side is evacuated continuously in order to effectively maintain the atmospheric pressure on the workpiece on the chuck work face.

**[Features]**
- A vacuum evacuation system, filter, vacuum tank and vacuum gage are incorporated neatly.
- Since connectors are provided, the pipes of vacuum and reverse jet required for control of the vacuum chuck can be connected easily.
- A difference in pressure over 80 kPa (600 mmHg) can be obtained continuously.

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**Table: VPU-E-AV Specifications**

<table>
<thead>
<tr>
<th>Model</th>
<th>Evacuation Volume</th>
<th>Continuous Pressure</th>
<th>Suction Port</th>
<th>Compressed Air</th>
<th>Dimensions</th>
<th>Tank Capacity</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPU-E10-AV</td>
<td>110N l/min</td>
<td>80 kPa (600 mmHg) or over</td>
<td>3/8</td>
<td>500—600 kPa (5—6 kg/cm²)</td>
<td>180 kPa/min</td>
<td>1/4</td>
<td>ø277 (10.9)</td>
</tr>
</tbody>
</table>

*The capacity of a compressor to use must be 2.5 kW or over. ø12 hose, 10 m long, is included as an accessory.

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**Piping of vacuum system**

![Diagram of piping system](image)
**Model KVR-GW** VACUUM CHUCK WITH BUILT-IN VACUUM SYSTEM

No external vacuum system required!
Air consumption reduced significantly!

[Application]
Suitable for light duty cutting by vacuum chucking such nonmagnetic workpieces as aluminum alloy, copper alloy, stainless steel and plastics.

[Features]
- Compared with the conventional ejector vacuum system, the air consumption amount can be reduced significantly.
- The chuck can be used simply by connecting a quick-connector type tube to a compressor in the factory.
- Since no vacuum system is required, the chuck has good response and is capable of holding and releasing workpieces quickly.
- Since air can be injected reversely through the suction port, the inside can be cleaned to facilitate maintenance.
- The internal parts can be replaced easily by removing the front cover of the chuck.
- The material of the main unit can be selected from two kinds: mild steel and aluminum alloy.
- Can be used in wet operations.

<table>
<thead>
<tr>
<th>Model</th>
<th>Main Unit Material</th>
<th>Nominal Size</th>
<th>Dimensions</th>
<th>Grid Pitch</th>
<th>Effective Area</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVR-GW150</td>
<td>Mild steel</td>
<td>150 (500) x 300</td>
<td>300 x 150</td>
<td>300 x 150</td>
<td>15 x 90</td>
<td>17kg</td>
</tr>
<tr>
<td>KVR-GW2050</td>
<td>Mild steel</td>
<td>200 (600) x 300</td>
<td>300 x 200</td>
<td>300 x 200</td>
<td>20 x 90</td>
<td>19kg</td>
</tr>
<tr>
<td>KVR-GW3060</td>
<td>Mild steel</td>
<td>300 (900) x 300</td>
<td>300 x 300</td>
<td>300 x 300</td>
<td>20 x 90</td>
<td>22kg</td>
</tr>
</tbody>
</table>

$m = 0.66 \times \frac{d}{4}$, air tube 4 m and clamp parts are included. $n$ The capacity of a compressor to use must be 0.75 kW or over.

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**Model KVR-G** VACUUM CHUCK (GRID SEAL TYPE)

[Application]
Suitable for grinding by vacuum chucking such nonmagnetic workpieces as aluminum alloy, copper alloy, stainless steel and plastics.

[Features]
- Workpieces are vacuum chucked in the area defined by seal rubber string sets in the grid grooves, ensuring good sealing and consistent holding power.
- A desired work area can be set by cutting the seal rubber string ($d \times 5 - 20$ m included) according to workpieces.
- The suction ports are provided in two places on all models to allow setting two workpieces.
- A vacuum coupler to connect to the vacuum system is provided. (Vacuum is turned on and off with the valve on the vacuum system.)
- Single stoppers are provided.
- The main unit is made of iron to enable the chuck to be held by an existing magnetic chuck.

See “Model KVR ELECTROMAGNETIC CHUCK WITH VACUUM CHUCK” on page 11.

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal Size</th>
<th>Dimensions</th>
<th>Grid Pitch</th>
<th>Effective Area</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVR-G1530</td>
<td>150 (500) x 300</td>
<td>55 x 120</td>
<td>20 x 20</td>
<td>120 x 120</td>
<td>22kg</td>
</tr>
<tr>
<td>KVR-G2050</td>
<td>200 (600) x 300</td>
<td>50 x 180</td>
<td>20 x 20</td>
<td>180 x 180</td>
<td>24kg</td>
</tr>
<tr>
<td>KVR-G3060</td>
<td>300 (900) x 300</td>
<td>60 x 250</td>
<td>20 x 20</td>
<td>250 x 250</td>
<td>28kg</td>
</tr>
</tbody>
</table>

$m = 0.66 \times \frac{d}{4}$, air tube 4 m and clamp parts are included. $n$ The capacity of a compressor to use must be 0.75 kW or over.

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An example of special specification
**Model VPU VACUUM SYSTEM**

**Dry/wet operations**

**Dry operation (Wet operation not allowed)**

**Examples of application of vacuum chucks and vacuum systems**

- **Vacuum system (VPU-E)**: Compressed air, Vacuum system, Operating valve, Vacuum chuck
- **Vacuum system (VPU-D)**: Compressed air, Vacuum system, Operating valve, Vacuum chuck

**Piping of vacuum system**

*Provide compressor.*

**Ejector type VPU-E**

<table>
<thead>
<tr>
<th>Model</th>
<th>Evacuation Volume</th>
<th>Continuous Pressure Difference</th>
<th>Suction Port</th>
<th>Power Source</th>
<th>Dimensions</th>
<th>Tank Capacity</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPU-E10</td>
<td>110N/min</td>
<td>80 kPa (600 mmHg) or over</td>
<td>3/8</td>
<td>3-phase 200 VAC, 0.4 kW</td>
<td>1280 (320)</td>
<td>700 (270)</td>
<td>710 (270)</td>
</tr>
<tr>
<td>VPU-E20</td>
<td>220N/min</td>
<td>80 kPa (600 mmHg) or over</td>
<td>3/8</td>
<td>3-phase 200 VAC, 0.4 kW</td>
<td>320 (128)</td>
<td>700 (270)</td>
<td>710 (270)</td>
</tr>
</tbody>
</table>

*The capacity of an ejector to use must be 2.5 kW or over for VPU-E10 and 4.5 kW or over for VPU-E20.* (1) Operating valve and (2) #12 hose 10 m and coupler for vacuum included.

**Dry pump type VPU-D (for dry operations)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Evacuation Volume</th>
<th>Continuous Pressure Difference</th>
<th>Suction Port</th>
<th>Power Source</th>
<th>Dimensions</th>
<th>Tank Capacity</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPU-D20</td>
<td>220-260N/min</td>
<td>80 kPa (600 mmHg) or over</td>
<td>3/8</td>
<td>3-phase 200 VAC, 0.4 kW</td>
<td>320 (128)</td>
<td>700 (270)</td>
<td>710 (270)</td>
</tr>
</tbody>
</table>

*The capacity of a pump to use must be around 0.75 kW.* (1) #8 hose 5 m and coupler for vacuum included.

**Model VPU-EG VACUUM SYSTEM**

**Dry operation (Wet operation not allowed)**

**Light weight and compact. Satisfactory functions!**

*Application*

A vacuum system dedicated to the grid seal type vacuum chucks.

*Features*

- The vacuum tank has been eliminated to make a very compact size compared with the conventional model (VPU-E10). This system can be handled easily.
- A function to check the vacuum status is incorporated.
- This is for dry operation.
- Auxiliary functions in consideration of operating status and safety are incorporated. (Vacuum adjustment, interlock with the machine via vacuum check output signals, etc.)

**Model VPU-OV OPERATION BLOCK WITH VACUUM GAGE**

*Application*

An option to facilitate the use of vacuum chucks.

*Features*

- The operating valve and the vacuum gage have been integrated to enable it to check the state of workpiece holding near the chuck.
- By changing the location of the blank cap, a position to mount the vacuum gage can be selected from three places.