New  For setup improvement of washing applications

Kosmek Products for Washing Application

High-Power Link Clamp for Washing Application
Model WCJ

High-Power Swing Clamp for Washing Application
Model WHJ
High-Power Swing Clamp for Washing Application  Model WHJ

Suitable for High-Pressure Washing and with Powerful Clamping Force and Holding Force Equivalent to Hydraulic Clamps
The lever swings 90° to clamp workpiece. → P.03

For High-Pressure Washing

High-Power Link Clamp for Washing Application  Model WCJ

Suitable for High-Pressure Washing and with Powerful Clamping Force and Holding Force Equivalent to Hydraulic Clamps
The lever pivots to clamp workpiece. → P.27
Before / After Washing Process
High-Power Swing Clamp for Washing Application

Model WHJ

Suitable for High-Pressure Washing

**Features**

**Durability**
The protective wall over the dust seal keeps washing liquid out.

- **Protective Wall**
  Prevents washing liquid from entering a cylinder.

- **Dust Seal**
  Prevents Foreign Substance

- **Swing Mechanism with High Speed and High Durability**
  Our strong hydraulic clamp mechanism is used to pneumatic clamps. Makes it faster with 3 lines of lead groove + outer race. (High Rigidity makes it possible to use a long lever.)
The High-Power Pneumatic Swing Clamp is a hybrid system using air pressure and a mechanical lock.

Action Description

**Released State**
- Lock Air: OFF
- Release Air: ON

**Locked State**
- Lock Air: ON
- Release Air: OFF

Diagram:
- **Released State**: The piston rod ascends to release.
- **Locked State**: The piston rod descends and the boosting piston activates. Exerts strong clamping force and holding force with the wedge mechanism.

Diagram:
- **Locking Operation** (Swing Stroke + Vertical Stroke 2mm)
  1. The piston rod rotates while it descends along the cam.
  2. After swing completion, the piston rod descends vertically until the lever clamps the workpiece.

**No Hydraulic Use**
Washing fixture system with high-power pneumatic clamps exerting equivalent force to hydraulic clamps needs no hydraulic pressure.

**Holding Force**
Minimal clamping force and powerful holding force minimize workpiece deformation. Mechanical locking allows holding force to exert 3 times the clamping force at most.
**Smaller Footprint**

Exerts three times clamping force compared to the same size general air cylinder. Smaller cylinder allows for more compact fixtures.

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**Energy Saving**

Energy-saving clamp exerts high clamping force with low pressure.

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**High Quality**

Optimum clamping force does not distort workpiece and holding force is strong enough to withstand washing load.

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**Light Weight**

High-Power Clamp for Washing Application allows for lighter fixture, minimizing load to the positioner.

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**High Accuracy**

High locating accuracy at locked position allows for precise clamping.

Swing Complete Position Repeatability：±0.75°
**Lineup**

### Standard Model

**Model WHJ**  
Clamp with 90° swing  
External Dimensions  
→ P.15

**Air Sensing Manifold Option**

**Model WHJ-M**  
External Dimensions  
→ P.17

**Air Sensing Piping Option**

**Model WHJ-N**  
External Dimensions  
→ P.19

**Able to Install Air Sensor**

### Accessories

**Speed Control Valve**  
**Model BZW-B**  
→ P.53

**Manifold Block**  
**Model WHZ-MD**  
→ P.55
**Model No. Indication**

**WHJ 160 0 - 2 A R**

1 Cylinder Force

- **060**: Cylinder Force 0.6 kN (Pneumatic Pressure 0.5MPa)
- **100**: Cylinder Force 1.0 kN (Pneumatic Pressure 0.5MPa)
- **160**: Cylinder Force 1.6 kN (Pneumatic Pressure 0.5MPa)
- **250**: Cylinder Force 2.4 kN (Pneumatic Pressure 0.5MPa)
- **400**: Cylinder Force 3.9 kN (Pneumatic Pressure 0.5MPa)

※ Cylinder force differs from clamping force and holding force.

2 Design No.

- **0**: Revision Number

3 Piping Method

- **A**: Gasket Option (with Ports for Speed Controller)
- **G**: Gasket Option (with R Thread Plug)
- **S**: Piping Option (Rc Thread)

※ Speed control valve (BZW) is sold separately. Please refer to P.53.

4 Swing Direction when Clamping

- **R**: Clockwise
- **L**: Counter-Clockwise

5 Action Confirmation Method

- **Blank**: None (Standard)
- **M**: Air Sensing Manifold Option
- **N**: Air Sensing Piping Option
### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WHJ0600-2</th>
<th>WHJ1000-2</th>
<th>WHJ1600-2</th>
<th>WHJ2500-2</th>
<th>WHJ4000-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder Force (at 0.5MPa)</td>
<td>kN</td>
<td>0.6</td>
<td>1.0</td>
<td>1.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Clamping Force (Calculation Formula)</td>
<td>kN</td>
<td>2.771×P</td>
<td>2.771×P</td>
<td>2.771×P</td>
<td>2.771×P</td>
</tr>
<tr>
<td>Holding Force (Calculation Formula)</td>
<td>kN</td>
<td>2.771×P</td>
<td>2.771×P</td>
<td>2.771×P</td>
<td>2.771×P</td>
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<tr>
<td>Full Stroke</td>
<td>mm</td>
<td>14</td>
<td>14.5</td>
<td>15</td>
<td>17.5</td>
</tr>
<tr>
<td>Swing Stroke (90°)</td>
<td>mm</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>11.5</td>
</tr>
<tr>
<td>Vertical Stroke</td>
<td>mm</td>
<td>6</td>
<td></td>
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<tr>
<td>Break down Idle Stroke</td>
<td>mm</td>
<td>2</td>
<td></td>
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<tr>
<td>Lock Stroke</td>
<td>mm</td>
<td>4</td>
<td></td>
<td></td>
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<td>Swing Angle Accuracy</td>
<td>90° ±3°</td>
<td></td>
<td></td>
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<tr>
<td>Swing Completion Position Repeatability</td>
<td>±0.75°</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Max. Operating Pressure</td>
<td>MPa</td>
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<tr>
<td>Min. Operating Pressure</td>
<td>MPa</td>
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<td>Withstanding Pressure</td>
<td>MPa</td>
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</tr>
<tr>
<td>Operating Temperature</td>
<td>°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usable Fluid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

1. F : Clamping Force (kN), Fk: Holding Force (kN), P : Supply Air Pressure (MPa), L : Distance between the piston center and the clamping point (mm).
2. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
   (Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.25.)
3. Minimum pressure to operate the clamp without load.
   The clamp may stop in the middle of swing action depending on the lever shape. (Refer to "Notes on Lever Design" on P.25.)
4. Please refer to External Dimensions for cylinder capacity and mass.
# High-Power Swing Clamp for Washing Application

## Clamping Force Curve

![Diagram showing clamping force curve](image)

(How to read the Clamping Force Curve)

- **WHJ0600**
  - Clamping Force Calculation Formula: \( F = (1.1666 - 0.00287 \times L) \times P \)
  - | Air Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range | Max. Lever Length (mm) |
  - | | | | |
  - | 0.5 | 0.57 | 0.53 | 0.50 | 0.47 | 0.44 | 120 |
  - | 0.4 | 0.45 | 0.42 | 0.40 | 0.37 | 0.35 | 0.32 | 0.29 | 180 |
  - | 0.3 | 0.34 | 0.32 | 0.30 | 0.28 | 0.26 | 0.24 | 0.22 | 180 |
  - | 0.2 | 0.23 | 0.21 | 0.20 | 0.19 | 0.18 | 0.16 | 0.15 | 180 |
  - Max. Operating Pressure (MPa) | 0.5 | 0.5 | 0.5 | 0.5 | 0.49 | 0.44 |

- **WHJ1000**
  - Clamping Force Calculation Formula: \( F = (1.8842 - 0.00346 \times L) \times P \)
  - | Air Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range | Max. Lever Length (mm) |
  - | | | | |
  - | 0.5 | 0.98 | 0.87 | 0.84 | 0.80 | 0.77 | 0.73 | 125 |
  - | 0.4 | 0.78 | 0.70 | 0.67 | 0.64 | 0.62 | 0.58 | 0.55 | 180 |
  - | 0.3 | 0.59 | 0.52 | 0.50 | 0.48 | 0.46 | 0.44 | 0.41 | 190 |
  - | 0.2 | 0.39 | 0.35 | 0.34 | 0.32 | 0.31 | 0.29 | 0.27 | 190 |
  - Max. Operating Pressure (MPa) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.44 |

- **WHJ1600**
  - Clamping Force Calculation Formula: \( F = (3.0603 - 0.00505 \times L) \times P \)
  - | Air Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range | Max. Lever Length (mm) |
  - | | | | |
  - | 0.5 | 1.57 | 1.43 | 1.38 | 1.33 | 1.28 | 1.22 | 125 |
  - | 0.4 | 1.25 | 1.14 | 1.10 | 1.06 | 1.02 | 0.97 | 0.92 | 174 |
  - | 0.3 | 0.94 | 0.86 | 0.83 | 0.80 | 0.77 | 0.73 | 0.69 | 200 |
  - | 0.2 | 0.63 | 0.57 | 0.55 | 0.53 | 0.51 | 0.49 | 0.46 | 200 |
  - Max. Operating Pressure (MPa) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.44 |

**Notes:**

1. **F**: Clamping Force (kN), **P**: Supply Air Pressure (MPa), **L**: Lever Length (mm).
2. Tables and graphs shown are the relationship between the clamping force (kN) and supply air pressure (MPa).
3. Cylinder force (When L=0) cannot be calculated from the calculation formula of clamping force.
4. Clamping force shown in the below tables and graphs is the value when clamping within the lock stroke range.
   (Please refer to “The specification value is not fulfilled when clamping out of the lock stroke range.” on P.25.)
5. The clamping force is shown with lever in the locked position.
6. The clamping force varies as per the lever length. Please use it with supply pneumatic pressure suitable for lever length.
7. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

- **WHJ1600**
  - Supply Air Pressure: 0.4MPa
  - Lever Length: 60mm
  - Clamping force is about 1.1kN.
### WHJ2500

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Cylinder Force (kN)</th>
<th>Clamping Force (kN)</th>
<th>Non-Usable Range ( )</th>
<th>Max Lever Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>2.44</td>
<td>2.20</td>
<td>2.13</td>
<td>2.07</td>
</tr>
<tr>
<td>0.4</td>
<td>1.96</td>
<td>1.76</td>
<td>1.71</td>
<td>1.65</td>
</tr>
<tr>
<td>0.3</td>
<td>1.47</td>
<td>1.32</td>
<td>1.28</td>
<td>1.24</td>
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<tr>
<td>0.2</td>
<td>0.98</td>
<td>0.88</td>
<td>0.85</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Max. Operating Pressure (MPa): 0.5 0.5 0.5 0.5 0.5 0.45

### WHJ4000

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Cylinder Force (kN)</th>
<th>Clamping Force (kN)</th>
<th>Non-Usable Range ( )</th>
<th>Max Lever Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>3.86</td>
<td>3.56</td>
<td>3.46</td>
<td>3.37</td>
</tr>
<tr>
<td>0.4</td>
<td>3.09</td>
<td>2.85</td>
<td>2.77</td>
<td>2.70</td>
</tr>
<tr>
<td>0.3</td>
<td>2.32</td>
<td>2.14</td>
<td>2.08</td>
<td>2.02</td>
</tr>
<tr>
<td>0.2</td>
<td>1.54</td>
<td>1.42</td>
<td>1.39</td>
<td>1.35</td>
</tr>
</tbody>
</table>

Max. Operating Pressure (MPa): 0.5 0.5 0.5 0.5 0.5 0.48

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**WHJ**

**High-Power Link Clamp for Washing Application**

**WHJ2500**

**WHJ4000**

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**WHZ**

**General Cautions**

**Related Products for Washing Application**

**Company Profile**

**Sales Offices**
**Holding Force Curve**

![Diagram showing Holding Force Curve]

*Notes:*
1. Holding force shows the force which can counter to reaction force in the clamping state, and differ from clamping force. Moreover, keep in mind that it may produce displacement depending on lever rigidity even if it is the reaction force below holding force.
2. When holding force calculated value exceeds the value of a limit line, holding force is a value of a limit line.
3. This table and the graph show the relation between holding force (kN) and lever length (mm).
4. Holding force shown in the below tables and graphs is the value when clamping within the lock stroke range. (Please refer to “The specification value is not fulfilled when clamping out of the lock stroke range.” on P.25.)
5. Holding force indicates the value when the lever locks a workpiece in horizontal position.
6. Holding force varies depending on the lever length. Set the supply air pressure suitable to the lever length.
7. Using in the non-usable range may damage the clamp and lead to fluid leakage.

### WHJ0600

Holding Force Formula

\[ F_k = \frac{2.771 \times P}{1 - 0.0025 \times L} \]

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Holding Force (kN)</th>
<th>Non-Usable Range</th>
<th>Lever Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>1.23</td>
<td>0.62</td>
<td>0.49</td>
</tr>
<tr>
<td>0.4</td>
<td>1.23</td>
<td>0.62</td>
<td>0.49</td>
</tr>
<tr>
<td>0.3</td>
<td>0.93</td>
<td>0.62</td>
<td>0.49</td>
</tr>
<tr>
<td>0.2</td>
<td>0.62</td>
<td>0.62</td>
<td>0.49</td>
</tr>
</tbody>
</table>

### WHJ1000

Holding Force Formula

\[ F_k = \frac{4.08 \times P}{1 - 0.0021 \times L} \]

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Holding Force (kN)</th>
<th>Non-Usable Range</th>
<th>Lever Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>2.23</td>
<td>1.13</td>
<td>0.91</td>
</tr>
<tr>
<td>0.4</td>
<td>1.78</td>
<td>1.13</td>
<td>0.91</td>
</tr>
<tr>
<td>0.3</td>
<td>1.34</td>
<td>1.13</td>
<td>0.91</td>
</tr>
<tr>
<td>0.2</td>
<td>0.89</td>
<td>0.98</td>
<td>0.91</td>
</tr>
</tbody>
</table>

### WHJ1600

Holding Force Formula

\[ F_k = \frac{6.628 \times P}{1 - 0.0012 \times L} \]

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Holding Force (kN)</th>
<th>Non-Usable Range</th>
<th>Lever Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>3.48</td>
<td>1.90</td>
<td>1.52</td>
</tr>
<tr>
<td>0.4</td>
<td>2.79</td>
<td>1.90</td>
<td>1.52</td>
</tr>
<tr>
<td>0.3</td>
<td>2.09</td>
<td>1.90</td>
<td>1.52</td>
</tr>
<tr>
<td>0.2</td>
<td>1.39</td>
<td>1.47</td>
<td>1.51</td>
</tr>
</tbody>
</table>
### WHJ2500

**Holding Force Formula \( F_k \) (kN)**

\[
F_k = \frac{10.481 \times P}{1 - 0.0008 \times L}
\]

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Holding Force (kN)</th>
<th>Non-Usable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lever Length L (mm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>0.5</td>
<td>5.21</td>
<td>3.91</td>
</tr>
<tr>
<td>0.4</td>
<td>4.40</td>
<td>3.91</td>
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<tr>
<td>0.3</td>
<td>3.30</td>
<td>3.36</td>
</tr>
<tr>
<td>0.2</td>
<td>2.20</td>
<td>2.24</td>
</tr>
</tbody>
</table>

### WHJ4000

**Holding Force Formula \( F_k \) (kN)**

\[
F_k = \frac{16.806 \times P}{1 - 0.0006 \times L}
\]

<table>
<thead>
<tr>
<th>Air Pressure (MPa)</th>
<th>Holding Force (kN)</th>
<th>Non-Usable Range</th>
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</thead>
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<tr>
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<td>Lever Length L (mm)</td>
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<td></td>
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<td>80</td>
</tr>
<tr>
<td>0.5</td>
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<td>7.92</td>
</tr>
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<td>0.4</td>
<td>6.97</td>
<td>7.06</td>
</tr>
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<td>0.3</td>
<td>5.23</td>
<td>5.30</td>
</tr>
<tr>
<td>0.2</td>
<td>3.49</td>
<td>3.53</td>
</tr>
</tbody>
</table>
Allowable Swing Time Graph

Adjustment of Swing Time

The graph shows allowable swing time against lever inertia moment. Please make sure that an operation time is more than the operation time shown in the graph.

Excessive action speed can reduce stopping accuracy and damage internal parts.

WHJ0600

WHJ1000

WHJ1600

WHJ2500

WHJ4000

Notes:
1. For any lever inertia moment, minimum 90° swing time should be 0.2 sec.
2. There may be no lever swing action with large inertia depending on supply air pressure, flow and lever mounting position.
3. For speed adjustment of clamp lever, please use meter-out flow control valve. In case of meter-in control, the clamp lever may be accelerated by its own weight during swinging motion (clamp mounted horizontally) or the piston rod may be moving too fast. (Please refer to P.25 for speed adjustment.)
4. Please contact us if operational conditions differ from those shown on the graphs.
(How to read the Allowable Swing Time Graph)

When using WHJ1600
Lever Inertia Moment : 0.005 kg\(\cdot\)m\(^2\)

1. 90° Swing Time when Locking : About 0.76 sec or more
2. 90° Swing Time when Releasing : About 0.38 sec or more
3. Total Lock Operation Time : About 1.27 sec or more
4. Total Release Operation Time : About 0.63 sec or more

The total operation time on the graph represents the allowable operation time when fully stroked.

### How to calculate inertia moment (Estimated)

\[ I = \text{Inertia Moment} \ (\text{kg} \cdot \text{m}^2) \]

\[ L_1, L_2, K, b \ : \text{Length} (\text{m}) \]

\[ m_1, m_2, m_3 \ : \text{Mass} (\text{kg}) \]

1. For a rectangular plate (cuboid), the rotating shaft is vertically on one side of the plate.

\[
I = m_1 \frac{4L_1^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12}
\]

2. For a rectangular plate (cuboid), the rotating shaft is vertically on the gravity center of the plate.

\[
I = m \frac{L^2 + b^2}{12}
\]

3. The load is applied on the lever front end.

\[
I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L^2 + b^2}{12} + m_1 K^2 + m_3 \frac{K^2 + b^2}{12}
\]
### C External Dimensions

A: Gasket Option (With Ports for Speed Controller: R-Thread Plug Included)

- The drawing shows the released state of WHJ-2AR.

- **Release Port: Rc1/8 Thread**
  
- **R1/8 Thread Plug (Included)**
  (Only for A option: Speed Control Valve Port)

- **Lock Port: Rc1/8 Thread**
  
- **R1/8 Thread Plug (Included)**
  (Only for A option: Speed Control Valve Port)

### C Machining Dimensions of Mounting Area

- **Release Port φ P**
  
- **Lock Port φ P**
  
- **4-EA Thread**

### Notes:

- **※4.** EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension ‘S’.
- **※5.** The depth of the body mounting hole φ D should be decided according to the mounting height referring to dimension ‘F’.
- **※6.** The machining dimension is for -A/-G: Gasket Option.

### C Piping Method

- **G: Gasket Option (With R Thread Plug)**
  
- The drawing shows the released state of WHJ-2GR.

- **S: Piping Option (Rc Thread)**
  
- The drawing shows the released state of WHJ-2SR.

### Notes:

- **※1.** The slot for lever phasing faces the port side when locked.
- **※2.** Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension ‘S’.
- **※3.** Speed control valve is sold separately. Please refer to P.53.
### Model No. Indication

(Format Example: WHJ1000-2AR, WHJ2500-2SL)
- **1** Cylinder Force
- **2** Design No.
- **3** Piping Method
- **4** Swing Direction when Clamping

### External Dimensions and Machining Dimensions for Mounting (mm)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WHJ0600-2</th>
<th>WHJ1000-2</th>
<th>WHJ1600-2</th>
<th>WHJ2500-2</th>
<th>WHJ4000-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Stroke</td>
<td>14</td>
<td>14.5</td>
<td>15</td>
<td>17.5</td>
<td>19.5</td>
</tr>
<tr>
<td>Swing Stroke (90°)</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>11.5</td>
<td>13.5</td>
</tr>
<tr>
<td>Vertical Stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idle Stroke</td>
<td>11</td>
<td>11.5</td>
<td>12</td>
<td>14.5</td>
<td>16.5</td>
</tr>
<tr>
<td>Lock Stroke</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- **7:** The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
- (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
- **8:** Mass of single swing clamp including taper sleeve and nut.
**External Dimensions**

A: Gasket Option (With Ports for Speed Controller : R-Thread Plug Included)  
※ The drawing shows the released state of WHJ-2ARM.

- Release Port: Rc1/8 Thread  
- RT/8 Thread Plug (Included)  
  (Only for A option: Speed Control Valve Port)

- Lock Port: Rc1/8 Thread  
- RT/8 Thread Plug (Included)  
  (Only for A option: Speed Control Valve Port)

**Machining Dimensions of Mounting Area**

- Release Port: φP  
- Lock Port: φP  
- 4-EA Thread  

**Piping Method**

G: Gasket Option (With R Thread Plug)  
※ The drawing shows the released state of WHJ-2GRM.

- 2-R1/8 Thread Plug (Included)

S: Piping Option (Rc Thread)  
※ The drawing shows the released state of WHJ-2SRM.

**Notes:**

※1. The slot for lever phasing faces the port side when locked.
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension ‘S’.
※3. Speed control valve is sold separately. Please refer to P.53.
   1. Please contact us when you require options in combination.
   2. Please refer to P.21~P.22 for Air Sensing Chart.
### Model No. Indication

![WHJ 160 0 - 2](image)

(Format Example : WHJ1000-2ARM, WHJ2500-2SLM)

1. Cylinder Force
2. Design No.
3. Piping Method
4. Swing Direction when Clamping
5. Action Confirmation (When M is chosen)

### External Dimensions and Machining Dimensions for Mounting

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WHJ0600-2</th>
<th>WHJ1000-2</th>
<th>WHJ1600-2</th>
<th>WHJ2500-2</th>
<th>WHJ4000-2</th>
</tr>
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<tbody>
<tr>
<td>Full Stroke</td>
<td>14</td>
<td>14.5</td>
<td>15</td>
<td>17.5</td>
<td>19.5</td>
</tr>
<tr>
<td>Swing Stroke (90°)</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>11.5</td>
<td>13.5</td>
</tr>
<tr>
<td>Vertical Stroke</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Break</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Idle Stroke</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Lock Stroke</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

| Recommended Stroke | 11 | 11.5 | 12 | 14.5 | 16.5 |
| A | 125 | 134.5 | 141 | 167 | 185.5 |
| B | 54 | 60 | 66 | 76 | 87 |
| C | 45 | 50 | 56 | 66 | 78 |
| D | 40 | 46 | 54 | 64 | 77 |
| E | 89 | 95.5 | 99 | 117.5 | 128 |
| F | 64 | 70.5 | 74 | 87.5 | 98 |
| Fu | 61 | 64 | 67 | 79.5 | 87.5 |
| G | 25 | 25 | 25 | 30 | 30 |
| H | 31.5 | 35 | 38 | 43 | 48 |
| J | 22.5 | 25 | 28 | 33 | 39 |
| K | 34 | 39 | 45 | 53 | 65 |
| L | 72 | 79 | 88 | 98 | 113 |
| M | 11 | 11 | 11 | 13 | 13 |
| Nx | 26 | 28 | 31 | 36 | 41 |
| Ny | 9.5 | 10 | 13 | 15 | 20 |
| P | max. φ3 | max. φ5 | max. φ5 | max. φ5 | max. φ5 |
| Q | 9.5 | 9.5 | 9.5 | 11 | 11 |
| R | 5.5 | 5.5 | 5.5 | 6.8 | 6.8 |
| S | 15.5 | 14 | 13.5 | 16 | 15 |
| T | 16 | 16.5 | 19.5 | 21.5 | |
| U | 12 | 14 | 16 | 20 | 25 |
| V | 10 | 12 | 14 | 17 | 21 |
| X (Nominal × Pitch) | M10×1 | M12×1.5 | M14×1.5 | M16×1.5 | M22×1.5 |
| Y | 4 | 5 | 5 | 6 | 8 |
| Z (Chamber) | C3 | R5 | R5 | R6 | R6 |
| AA | 17 | 19 | 22 | 24 | 32 |
| AB | 6 | 6.5 | 7 | 8 | 10 |
| AC | 19 | 21.2 | 24.5 | 26.5 | 35.5 |
| BA | 11 | 13 | 15 | 18 | 22 |
| BB | 14 | 16 | 18 | 22 | 28 |
| CA | 4.5 | 5 | 6 | 8 | 10 |
| CB | 4.5 | 4.5 | 6.5 | 5.5 | 9.5 |
| CC | 3 | 4 | 4 | 4 | 6 |
| EA (Nominal × Pitch) | M5×0.8 | M5×0.8 | M5×0.8 | M6×1 | M6×1 |
| MA | 36 | 39 | 39 | 44 | 44 |
| MBF | 28 | 38 | 38 | 45 | 45 |
| MBF | 28 | 38 | 38 | 45 | 45 |
| MC | 29.2 | 39.2 | 39.2 | 46.2 | 46.2 |
| MD | 75.5 | 92.5 | 86 | 100 | 110.5 |
| ME | 88.5 | 97.5 | 101 | 118.5 | 129 |
| MF | 65 | 71.5 | 75 | 88.5 | 99 |
| MG | 6 | 6.5 | 6.5 | 7 | 7 |
| MH | 9 | 9 | 9 | 9 | 9 |
| MJ | 4 | 6 | 6 | 9.5 | 9.5 |
| MK | 9 | 9.5 | 9.5 | 10.5 | 10.5 |
| ML | 102 | 111.5 | 115 | 133.5 | 144 |
| O-ring (A/B option) | 1BPS | 1BPF | 1BPF | 1BPF | 1BPF |

| 3-O-ring | ASS68-021 (70°) | ASS68-028 (70°) | ASS68-028 (70°) | ASS68-030 (70°) | ASS68-030 (70°) |
| Cyl. Capacity | 12.8 | 21.8 | 35.5 | 61.3 | 103.8 |
| cm³ | 14.5 | 24.4 | 39.1 | 67.2 | 115.4 |
| Notes: |  ※8. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
※9. Mass of single swing clamp including taper sleeve and nut.
**External Dimensions**

A : Gasket Option (With Ports for Speed Controller : R-Thread Plug Included)
- The drawing shows the released state (piping joint installed) of WHJ-2ARN.

Release Port: Rc1/8 Thread \(^{0,3}\)
R1/8 Thread Plug (Included)(Only for A option : Speed Control Valve Port)

Lock Port: Rc1/8 Thread \(^{0,3}\)
R1/8 Thread Plug (Included)(Only for A option : Speed Control Valve Port)

**Machining Dimensions of Mounting Area**

Release Port \(\phi P \geq 8\)
Lock Port \(\phi P \geq 8\)

4-EA Thread \(^{0,6}\)

Remove all burrs \(^{0,8}\)

Notes:
- **5.** Air vent port must be open to the atmosphere, and prevent washing liquid.
- **6.** EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- **7.** The depth of mounting hole \(\phi D\) should be less than dimension 'F'.
- **8.** The machining dimension is for -A/-G : Gasket Option.

**Piping Method**

G : Gasket Option (With R Thread Plug)
- The drawing shows the released state of WHJ-2GRN.

S : Piping Option (Rc Thread)
- The drawing shows the released state of WHJ-2SRN.

Notes:
- **1.** The slot for lever phasing faces the port side when locked.
- **2.** Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- **3.** Speed control valve is sold separately. Please refer to P.53.
- **4.** Piping joint and set screw will be shipped as attachments. Make sure not to damage O-ring and insert the piping joint from the bottom of the cylinder and fix it with set screw.
- **1.** Please contact us when you require options in combination.
- **2.** Please refer to P.21~P.22 for Air Sensing Chart.
### Model No. Indication

![WHJ 160 0 - 2](image)

(Format Example: WHJ1000-2ARN, WHJ2500-2SLN)

- Cylinder Force
- Design No.
- Piping Method
- Swing Direction when Clamping
- Action Confirmation (When N is chosen)

### External Dimensions and Machining Dimensions for Mounting

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WHJ0600-2.1 N</th>
<th>WHJ1000-2.1 N</th>
<th>WHJ1600-2.1 N</th>
<th>WHJ2500-2.1 N</th>
<th>WHJ4000-2.1 N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Stroke</td>
<td>14</td>
<td>14.5</td>
<td>15</td>
<td>17.5</td>
<td>19.5</td>
</tr>
<tr>
<td>Swing Stroke (90°)</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>11.5</td>
<td>13.5</td>
</tr>
<tr>
<td>Vertical Stroke</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<tr>
<td>Break Idle Stroke</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Lock Stroke (N)</td>
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<td>4</td>
<td>4</td>
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<td>4</td>
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<td>Recommended Stroke</td>
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<td>125</td>
<td>134.5</td>
<td>141</td>
<td>167</td>
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<td>B</td>
<td>54</td>
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<td>87</td>
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<td>D</td>
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<td>89</td>
<td>95.5</td>
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<td>98</td>
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<td>87.5</td>
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<td>25</td>
<td>30</td>
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<td>H</td>
<td>31.5</td>
<td>35</td>
<td>38</td>
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<td>22.5</td>
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<td>28</td>
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<td>39</td>
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</tr>
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<td>Nx</td>
<td>26</td>
<td>28</td>
<td>31</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>Ny</td>
<td>9</td>
<td>10</td>
<td>13</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>P</td>
<td>max. φ 3</td>
<td>max. φ 5</td>
<td>max. φ 5</td>
<td>max. φ 5</td>
<td>max. φ 5</td>
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<td>R</td>
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</tr>
<tr>
<td>T</td>
<td>16</td>
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<td>17</td>
<td>19.5</td>
<td>21.5</td>
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<tr>
<td>U</td>
<td>12</td>
<td>14</td>
<td>16</td>
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<td>25</td>
</tr>
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<td>V</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>17</td>
<td>21</td>
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<td>W</td>
<td>10</td>
<td>10.5</td>
<td>11</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>X (Nominal × Pitch)</td>
<td>M10 × 1</td>
<td>M12 × 1.5</td>
<td>M14 × 1.5</td>
<td>M16 × 1.5</td>
<td>M22 × 1.5</td>
</tr>
<tr>
<td>Y</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Z (Chamfer)</td>
<td>C3</td>
<td>R5</td>
<td>R5</td>
<td>R6</td>
<td>R6</td>
</tr>
<tr>
<td>AA</td>
<td>17</td>
<td>19</td>
<td>22</td>
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<td>AB</td>
<td>6</td>
<td>6.5</td>
<td>7</td>
<td>8</td>
<td>10</td>
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<tr>
<td>AC</td>
<td>19</td>
<td>21.2</td>
<td>24.5</td>
<td>26.5</td>
<td>35.5</td>
</tr>
<tr>
<td>BA</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>BB</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>CA</td>
<td>4.5</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>CB</td>
<td>4.5</td>
<td>4.5</td>
<td>6.5</td>
<td>5.5</td>
<td>9.5</td>
</tr>
<tr>
<td>CC</td>
<td>3</td>
<td>4</td>
<td>4</td>
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<td>6</td>
</tr>
<tr>
<td>EA (Nominal × Pitch)</td>
<td>M5 × 0.8</td>
<td>M5 × 0.8</td>
<td>M5 × 0.8</td>
<td>M6 × 1</td>
<td>M6 × 1</td>
</tr>
<tr>
<td>NA</td>
<td>38.5</td>
<td>41.5</td>
<td>41.5</td>
<td>46.5</td>
<td>46.5</td>
</tr>
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<td>49</td>
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<td>66</td>
<td>66</td>
</tr>
<tr>
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<tr>
<td>NE</td>
<td>23.5</td>
<td>28.5</td>
<td>28.5</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>NF</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>O-ring (A/G option)</td>
<td>1BP5</td>
<td>1BP7</td>
<td>1BP7</td>
<td>1BP7</td>
<td>1BP7</td>
</tr>
<tr>
<td>Cylinder Capacity cm³</td>
<td>12.8</td>
<td>21.8</td>
<td>35.5</td>
<td>61.3</td>
<td>103.8</td>
</tr>
<tr>
<td>Lock Release</td>
<td>14.5</td>
<td>24.4</td>
<td>39.1</td>
<td>67.2</td>
<td>115.4</td>
</tr>
<tr>
<td>Mass kg</td>
<td>0.7</td>
<td>1.0</td>
<td>1.2</td>
<td>2.0</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Notes:

*9. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.

(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

*10. Mass of single swing clamp including taper sleeve and nut.
Air Sensing Option (Action Confirmation Method: -M : Air Sensing Manifold Option / N : Air Sensing Piping Option)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor connected to lock confirmation port and release confirmation port.

Applicable Model

WHJ 160 0 - 2

Action Confirmation Method:
- When M/N is chosen

About Air Catch Sensor

Air catch sensor is required in order to conduct the action confirmation of the piston rod.

The essential condition: Air catch sensor with consumption rate more than 22〜25L/min (at 0.2 MPa)

Recommended Operating Air Pressure : 0.2 MPa

Recommended Air Catch Sensor

<table>
<thead>
<tr>
<th>Maker</th>
<th>SMC</th>
<th>CKD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Air Catch Sensor</td>
<td>Gap Switch</td>
</tr>
<tr>
<td>Model No.</td>
<td>ISA2-H</td>
<td>GPS2-07-15</td>
</tr>
</tbody>
</table>

In order to carry out stabilized detection, the number of clamps connected per air catch sensor should be no more than 4.
The air pressure to the air catch sensor should be 0.2MPa.
Refer to the drawing below for the air circuit composition.

Notes for Use and Installation

- Air vent port must be open to the atmosphere and kept free of coolant, chips or other debris.
The air catch sensor can malfunction if the air vent port is blocked.

- Grease the O-ring before assembly to fixture.
If it is mounted under dry state, the O-ring may have twisting or be defective.
If excessive grease is applied, the grease may overflow to block the detection port, resulting in malfunctioning of the air catch sensor.
Air Sensing Chart

Number directly connected to clamp: 1

Notes:
1. Sensing chart shown is the relationship between the stroke and detection circuit air pressure.
2. The position where the air catch sensor has ON signal output varies depending on the sensor setting.
3. The detection pressure varies depending on the number of clamps connected per circuit. (Maximum number of clamps connected: 4)
4. The features may vary depending on the air circuit structure. Please contact us for further information.

※1. There is a certain tolerance with regard to the position where the pressure for fully closing the detection nozzle is reached depending on the clamp structure. (Refer to the sensing chart.)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WHJ0600-2.1/M/N</th>
<th>WHJ1000-2.1/M/N</th>
<th>WHJ1600-2.1/M/N</th>
<th>WHJ2500-2.1/M/N</th>
<th>WHJA000-2.1/M/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Stroke mm</td>
<td>14</td>
<td>14.5</td>
<td>15</td>
<td>17.5</td>
<td>19.5</td>
</tr>
</tbody>
</table>

Number directly connected to clamp: 4 (for reference)
**Taper Lock Lever Design Dimensions**

Reference for designing taper lock swing lever.

<table>
<thead>
<tr>
<th>Corresponding Model No.</th>
<th>WHJ0600-2</th>
<th>WHJ1000-2</th>
<th>WHJ1600-2</th>
<th>WHJ2500-2</th>
<th>WHJ4000-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>B</td>
<td>11</td>
<td>13</td>
<td>15</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>8.5</td>
<td>8.5</td>
<td>10.5</td>
<td>10.5</td>
<td>14.5</td>
</tr>
<tr>
<td>E</td>
<td>14 ±0.07</td>
<td>16 ±0.07</td>
<td>18 ±0.07</td>
<td>22 ±0.03</td>
<td>28 ±0.03</td>
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<td>F</td>
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<td>13</td>
<td>15</td>
<td>17</td>
<td>23.5</td>
</tr>
<tr>
<td>G</td>
<td>6</td>
<td>7.1</td>
<td>8.1</td>
<td>10.1</td>
<td>13.1</td>
</tr>
</tbody>
</table>

**Dimensions (mm)**

| A           | 3 ±0.01  
| B           | 0.4 ±0.01 |
| C           | 0.4 ±0.01 |
| φ H       | Φ 6 (h8) × 14 |
| φ F       | Φ 4 (h8) × 10 |
| φ E       | Φ 4 (h8) × 10 |
| φ M       | Φ 4 (h8) × 10 |
| φ S       | Φ 3 (h8) × 8 |

Notes:

1. Swing lever should be designed with its length according to performance curve.
2. If the swing lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.

*1 The pin hole (φ H) for determining the lever phase should be included, if necessary.*

Additional machining is not required if there is no phasing needed.

*2 Phasing pin is not included. Prepare it separately.*
**Accessories : Others**

- We offer more accessories for model WHJ.

---

**Speed Control Valve**  
Model: **BZW-B**  
*Use BZW□-B for WHJ.*

Refer to P.53 for reference.

---

**Manifold Block**  
Model: **WHZ-MD**

Refer to P.55 for reference.
Cautions

1) Notes for Design
   - Check Specifications
     - Please use each product according to the specifications.

2) Notes for Circuit Design
   - Ensure there is no possibility of supplying air pressure to the lock
     and release ports simultaneously. Improper circuit design may lead
     to malfunctions and damages.

3) Swing lever should be designed so that the inertia moment is small.
   - Large inertia moment will degrade the lever’s stopping accuracy
     and cause undue wear to the clamp.
   - Additionally, the clamp may not function, depending on supplied
     air pressure and lever mounting position.
   - Please set the operating time after the inertia moment is calculated.
     Please make sure that the clamps work within allowable operating
     time referring to the allowable operating time graph.
   - If supplying a large amount of air right after installation, action
     time will be extremely fast leading to severe damage on a clamp.
     Install the speed controller (meter-in) near the air source and
     gradually supply air pressure.

4) When clamping on a sloped surface of a workpiece
   - Make sure the clamping surface and mounting surface of the clamp
     are parallel.

5) Do not inject high-pressure washing liquid directly to a clamp.
   - Direct injection of high-pressure washing liquid to a clamp
     leads to damage and invasion of washing liquid.

7) Notes for Lever Design
   - Please design the lever as light as possible, and it should be
     no larger than necessary.
   - The clamp may not function depending on supplying air pressure,
     mounting position and shape of the lever. If using a large lever with
     the mounting position shown below, it may stop in the middle of
     swing action. Please use a lever with (Lever Weight W) × (Gravity
     Center S) lighter than shown in the below list.

8) The specification value is not fulfilled when clamping out of the
   - The mechanical lock function will not work when clamping within
     the range of swing stroke and idle stroke, and the specification value
     of cylinder force, clamping force, holding force and swing completion
     position repeatability will not be fulfilled.
   - The actual stroke of the piston that descends from the release-end
     to lock-end should be designed to have the same value as
     the recommended stroke listed in the external dimensions.
Installation Notes

1) Usable Fluid
● Please supply filtered clean dry air. (Install the drain removing device.)
● Oil supply with a lubricator etc. is unnecessary. Oil supply with a lubricator may cause loss of the initial lubricant. The operation under low pressure and low speed may be unstable. (When using secondary lubricant, please supply lubricant continuously. Otherwise, the initial grease applied from KOSMEK will be removed from the secondary lubricant.)

2) Procedure before Piping
● The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly.
The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
● There is no filter provided with this product for prevention of contaminants in the air circuit.

3) Applying Sealing Tape
● Wrap with tape 1 to 2 times following the screw direction.
Wrapping in the wrong direction will cause leakage and malfunction.
● Pieces of the sealing tape can lead to air leakage and malfunction.
● When piping, be careful that contaminant such as sealing tape does not enter in products.

4) Installation of the Product
● When mounting the product use four hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

<table>
<thead>
<tr>
<th>Model</th>
<th>Thread Size</th>
<th>Tightening Torque(N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHJ6000</td>
<td>M5 × 0.8</td>
<td>6.3</td>
</tr>
<tr>
<td>WHJ1000</td>
<td>M5 × 0.8</td>
<td>6.3</td>
</tr>
<tr>
<td>WHJ1600</td>
<td>M5 × 0.8</td>
<td>6.3</td>
</tr>
<tr>
<td>WHJ2500</td>
<td>M6 × 1</td>
<td>10</td>
</tr>
<tr>
<td>WHJ4000</td>
<td>M6 × 1</td>
<td>10</td>
</tr>
</tbody>
</table>

5) Installing Flow Control Valve
● Tightening torque for installing flow control valve is 5 to 7 N • m.

6) Installation / Removal of the Swing Lever
● Oil or debris on the mating surfaces of the lever, taper sleeve or piston rod can cause the rod to loosen.
Please clean them thoroughly before assembly.
● Lever mounting bolt torques are shown below.

<table>
<thead>
<tr>
<th>Standard - Taper Lock Lever Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>WHJ6000</td>
</tr>
<tr>
<td>WHJ1000</td>
</tr>
<tr>
<td>WHJ1600</td>
</tr>
<tr>
<td>WHJ2500</td>
</tr>
<tr>
<td>WHJ4000</td>
</tr>
</tbody>
</table>

● If the piston rod is subjected to excessive torque or shock, the rod or the internal mechanism may be damaged.
Observe the following points to prevent such shock.

For Installation
1) With the clamp positioned to the fixture, determine the lever position, and temporarily tighten the nut for fixing the lever.
2) Remove the clamp from the fixture, fix the lever with machine vise etc., and tighten the nut.
3) If tightening the nut with the clamp positioned to the fixture, please use a wrench to the hexagon part of piston rod, or fix the lever with a spanner. It is best to bring the lever to the middle of the swing stroke before tightening the nut.

For Removal
1) While the clamp is fixed to the fixture or vise, use a wrench to bring the lever to the middle of the swing stroke and then loosen the nut.
2) Loosen the nut after securing the lever two or three turns then remove the lever with a puller without any rotational torque applied on the piston rod.

7) Swing Speed Adjustment
● Adjust the speed following *Allowable Swing Time Graph*. If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
● Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

8) Checking looseness and retightening
● At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

※ Please refer to P.57 for common cautions.
Air Flow Control Valve
Model BZW

Directly mounted to clamps, easy adjusting

Directly Mounted to Clamps
BZW is the flow control valve for Rc thread that enables to mount to the piping method - A option of WHJ / WCJ. It is best used in a circuit where the flow control valve cannot be mounted or if necessary to synchronize individual speed.

Adjusting Screw
Lock Nut

Corresponding Product Model

<table>
<thead>
<tr>
<th>Clamp</th>
<th>BZW Model No.</th>
<th>Clamp Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-Power Link Clamp for Washing Application</td>
<td>BZW0100-A</td>
<td>WCJ 0-2</td>
</tr>
<tr>
<td>High-Power Swing Clamp for Washing Application</td>
<td>BZW0100-B</td>
<td>WHJ 0-2</td>
</tr>
</tbody>
</table>

Corresponding to piping method - A option.
※ When mounting BZW to piping method G, take off R thread plug and remove the seal tape not to get inside cylinder.
Model No. Indication

**BZW 010 0 – B**

<table>
<thead>
<tr>
<th>Control Method</th>
<th>BZW0100-B</th>
<th>BZW0100-A</th>
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</thead>
<tbody>
<tr>
<td>Control Method</td>
<td>Meter-out</td>
<td>Meter-in</td>
</tr>
<tr>
<td>Operating Pressure (MPa)</td>
<td>0.1 ~ 1.0</td>
<td>0.1 ~ 1.0</td>
</tr>
<tr>
<td>Withstanding Pressure (MPa)</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Adjust Screw Number of Rotations</td>
<td>10 Rotations</td>
<td>10 Rotations</td>
</tr>
<tr>
<td>Tightening Torque (N·m)</td>
<td>5 ~ 7</td>
<td>5 ~ 7</td>
</tr>
<tr>
<td>Corresponding Model No.</td>
<td>WHJ-2A</td>
<td>WCJ-2A</td>
</tr>
</tbody>
</table>

**Specifications**

**Circuit Symbol**

**BZW0100-B : Meter-out**

- P1 Port: Air Source Side (Incoming Side)
- P2 Port: Clamp Side (Outgoing Side)

**BZW0100-A : Meter-in**

- P1 Port: Air Source Side (Incoming Side)
- P2 Port: Clamp Side (Outgoing Side)

**Flow Rate Graph**

**External Dimensions**

**Flow Rate Graph**

**Machining Dimensions of Mounting Area**

- Adjusting Screw
- Lock Nut
- O-ring (included)

- Packing
- BZW-B Mounting direction of BZW-A is opposite

Notes:
1. Since the area is sealing part, be careful not to damage it.
2. No cutting chips or burr should be at the tolerance part of machining hole.
3. As shown in the drawing, P1 port is used as the air supply side and P2 port as the clamp side.
Manifold Block

Model WHZ-MD

- Manifold Block
  The mounting height of clamp is adjustable with the manifold block.

Clamp

Manifold Block

Workpiece

Fixture Base
### Manifold Block for WCJ/WHJ

#### Model No. Indication

**WHZ 048 0 - MD**

*Size Refer to following table*

#### Corresponding Item Model Number

<table>
<thead>
<tr>
<th>Model No.</th>
<th>WHZ0600-MD</th>
<th>WHZ0320-MD</th>
<th>WHZ0400-MD</th>
<th>WHZ0500-MD</th>
<th>WHZ0630-MD</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>23</td>
<td>25</td>
<td>27</td>
<td>31</td>
<td>35</td>
</tr>
<tr>
<td>B</td>
<td>54</td>
<td>60</td>
<td>67</td>
<td>77</td>
<td>88.5</td>
</tr>
<tr>
<td>C</td>
<td>45</td>
<td>50</td>
<td>58</td>
<td>68</td>
<td>81</td>
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<tr>
<td>D</td>
<td>40</td>
<td>46</td>
<td>54</td>
<td>64</td>
<td>77</td>
</tr>
<tr>
<td>H</td>
<td>31.5</td>
<td>35</td>
<td>38</td>
<td>43</td>
<td>48</td>
</tr>
<tr>
<td>J</td>
<td>22.5</td>
<td>25</td>
<td>29</td>
<td>34</td>
<td>40.5</td>
</tr>
<tr>
<td>K</td>
<td>34</td>
<td>39</td>
<td>45</td>
<td>53</td>
<td>65</td>
</tr>
<tr>
<td>Nx</td>
<td>26</td>
<td>28</td>
<td>31</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>Ny</td>
<td>9</td>
<td>10</td>
<td>13</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>R</td>
<td>5.5</td>
<td>5.5</td>
<td>5.5</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>O-ring</td>
<td>18P5</td>
<td>18P7</td>
<td>18P7</td>
<td>18P7</td>
<td>18P7</td>
</tr>
<tr>
<td>Mass kg</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
</tr>
</tbody>
</table>

**Notes:**
1. Material: A2017BE-T4
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the A dimensions as a reference.
3. If thickness other than A is required, perform additional machining on surface Z. Please refer to the drawing.
Cautions

• Notes on Handling

1) It should be handled by qualified personnel.
   • The hydraulic machine and air compressor should be handled and maintained by qualified personnel.

2) Do not handle or remove the product unless the safety protocols are ensured.
   ① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
   ② Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
   ③ After stopping the machine, do not remove until the temperature cools down.
   ④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch clamp (cylinder) while clamp (cylinder) is working. Otherwise, your hands may be injured due to clinching.

4) Do not disassemble or modify.
   • If the product is taken apart or modified, the warranty will be voided even within the warranty period.

• Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
   • Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
   • Make sure there is no abnormality in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod.
   • If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.

3) Regularly tighten pipings, mounting bolts, nuts, snap rings and cylinders to ensure proper use.

4) Make sure there is smooth action and no abnormal noise.
   • Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

5) The products should be stored in the cool and dark place without direct sunshine or moisture.

6) Please contact us for overhaul and repair.
Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
- Defects or failures caused by the following are not covered:
  1. If the stipulated maintenance and inspection are not carried out.
  2. If the product is used while it is not suitable for use based on the operator’s judgment, resulting in defect.
  3. If it is used or handled in an inappropriate way by the operator.
     (Including damage caused by the misconduct of the third party.)
  4. If the defect is caused by reasons other than our responsibility.
  5. If repair or modifications are carried out by anyone other than Kosmek, without our approval and confirmation, it will void warranty.
  6. Other caused by natural disasters or calamities not attributable to our company.
  7. Parts or replacement expenses due to parts consumption and deterioration.
     (Such as rubber, plastic, seal material and some electric components.)

- Damages excluding from direct result of a product defect shall be excluded from the warranty.
Introducing Kosmek Products

Robotic Hand Changer ►P.61

Robotic Hand Series ►P.65

High Accuracy Locating・Clamping ►P.67
for Washing Application

Auto Coupler
► P.68

Work Support
► P.69

FA・Industrial Robot Related Products Complete Catalog

Please find further information on our complete catalog. You can order from our website (http://www.kosmek.co.jp/english/).
The World's Only
Robotic Hand Changer with Zero Backlash
Model SWR

KOSMEK Exclusive Non-Backlash Mechanism

Before Connection

Backlash of Changer Causes Electrode Error
Noise and Continuity Failure due to Friction of Contact Probe

When Connected

Zero-Backlash Connection with Dual Contact
Kosmek Hand Changer with No Backlash Prevents Electrode Error
No Noise

Detaching Function

Continuity Failure of Electrode
Frequent Moment Stop

No Continuity Failure of Electrode
Sharp Decline of Moment Stop
Secures the Aimed Position
When Connected, Locating Repeatability is $3 \mu m$

Even with long tools or hands, fluctuation of the edge is extremely small. It secures high accuracy processing even after tool change.

24-Hour Continuous Operation is Possible
Uncomparably High Rigidity and Durability

Strong to "bending" and "torsion" with high rigidity obtained by non-backlash function.
Also, high strength material is used in all the contact part of the master and tool so that it ensures high durability and $3 \mu m$ locating repeatability even after 1 million cycles.

A Variety of Electrode/Air Joint Options

- Resin Connector Electrode
- Solder Terminal
- Solder Terminal with Cable
- Waterproof Electrode (Simple Waterproof) Only when connected : Equivalent to IP54
- D-sub Connector
- Circular Connector (Connector Based on JIS C 5432)
- Compact Electric Power Transmission (Ability to Transmit AC/DC200V 5A)
- Power Transmission Option (Connector Based on MIL-DTL-5015)
- High Current Transmission Option (Connector Based on MIL-DTL-5015)
- Waterproof Electrode (Noncontact Waterproof) IP67 Compact Model
- Waterproof Electrode (Noncontact Waterproof) IP67
- Air Joint with Larger Port (3 Port Option)
- Air Joint (2 Port Option)
- Air Joint (4 Port • Solder Terminal Extensible Option)
- Air Port with Check Valve
**Change the Transfer Hand and Deburring Tool with High Rigidity**

Withstands Heavy Load with Non-Backlash Function

Strong to "bending" and "torsion" with high rigidity.
It ensures stable production even with offset transfer hand or heavy load deburring.

### General Changer

Backlash on Changer Part

Due to backlash, a tool changer is weak to torsion and can be broken if high load is applied when deburring R surface which has large contact area.

<table>
<thead>
<tr>
<th>Low Load</th>
<th>High Load</th>
</tr>
</thead>
</table>

Contact area of R surface is large and receives high load.

### Kosmek Robotic Hand Changer

No Backlash on Changer Part

The changer has no backlash so it is highly rigid and strong to torsion. This allows for no fluctuation on tools.

It also withstands high load of casting deburring.
Increase in Allowable Weight with SWT Air Locating Clamp

By using Kosmek Air Locating Clamp SWT, Robotic Hand Changer can be used for larger robots. It is able to install Kosmek Air Joint as well.
Light and Compact Robotic Hand Series for Factory Automation

Kosmek Exclusive Internal Chuck Series

High-Power Pneumatic Hole Clamp
Model SWE
Can be used in machine tools. Gripper expands and pulls workpiece in.
High Power with Foreign Substance Prevention for Machine Tools, etc.
Workpiece Diameter φ6 ~ φ13 in 0.5mm increments.

FA Pneumatic Hole Clamp
Model WKH
Gripper expands and pulls workpiece in.
Light Body with Selectable Functions: Locating and Floating
Workpiece Diameter φ6 ~ φ14 in 0.5mm increments.

Ball Lock Cylinder
Model WKA
Secures/Transfers a pallet and prevents falling off with steel balls.
Powerful, Light and Compact
Pull-Out Load Capacity (Holding Force): 50N / 70N / 100N

External Chuck Series

Robotic Hands
Model WPS / WPA
WPH / WPP / WPQ
Compact Body with High Gripping Force
Highly Versatile Robotic Hands for Various Usage
Workpiece Washing Examples with High-Power Pneumatic Hole Clamp

Model SWE

Chucking Inside of Workpiece Holes Allows for

Thorough Washing with no interference

As Robotic Hand

As Fixture Pallet

Chucking Inside of Workpiece Holes Allows for

Compact and Light Applications

Larger Space

Smaller Space

Reduce the Hand Weight

Linear Cylinder Holding Periphery

Compact Transfer Application with High-Power Pneumatic Clamp

Please refer to [FA • Industrial Robot Related Products Complete Catalog] for further information.
Compact Location Clamp
Model SWQ

Locates and clamps a fixture on a positioner simultaneously.

[Locating Repeatability 3 μm]

Allows for setup time reduction and productivity improvement.
Pneumatic Location Clamp Series

Compact Pneumatic Location Clamp
Model SWQ
Compact Model. Suitable for setup of compact pallets and light fixtures.
Locating Repeatability : 3 μm

Pneumatic Location Clamp
Model SWT
With Foreign Substance Prevention for Machine Tools, etc.
Locating Repeatability : 3 μm

High-Power Pneumatic Pallet Clamp
Model WVS
High-power model that exerts equivalent clamping force with hydraulic clamps.
Locating Repeatability : 3 μm

Action Description

Air Blow and Seating Check
Foreign substance dust is flushed out by air blow. Seating surface is provided with the air hole. Use the gap sensor for seat check.

Self Lock (Safety) Function
(Holding Force at 0MPa Air Pressure)
Maintains clamped state.

Even if air pressure is at zero, it will stay locked with self-locking spring. More than the minimum operating air pressure is required for locating.

Automatic Air Supply to a Pallet on a Positioner

Auto Coupler
Model JVA/JVB JVC/JVD JVE/JVF

Compact Coupler to Connect Hydraulic/Pneumatic/Coolant Circuits
Connection Stroke : 1mm Commonly Used with Screw Locator and Pneumatic Location Clamp
Automation Products

Powerful Support for Unstable Parts

High-Power Pneumatic Work Support (Standard / Rodless Hollow)

Model: WNC / WNA

Firmly Supports the Workpiece and Prevents Chattering and Distortion

Locks when the tip of work support contacts a workpiece.

Securely supports a workpiece with various heights.

High Accuracy Locating of Workpiece • Pallet

Expansion Locating Pin

Model: VWM / VX

Zero Clearance with High Accuracy Locating Pin

Workpiece Hole Diameter: φ 8 ~ φ 20

Expansion Locating Pin

Model: VWM
Locating Repeatability: 3 μm

Air Lock / Spring Release

Expansion Locating Pin

Model: VX
Locating Repeatability: 5 μm

Air Lock / Manual Release

Fixed Pin

Loading/Unloading
Locating

Difficult to Load/Unload
Some Clearance

Expansion Locating Pin

Loading/Unloading (Released)
Locating (Locked)

Easy to Load/Unload
Zero Clearance and High Accuracy
### MEMO

| High-Power Swing Clamp for Washing Application | WHJ |
| High-Power Link Clamp for Washing Application | WCJ |
| Air Flow Control Valve | BZW |
| Manifold Block | WHZ-MD |

**General Cautions**

**Related Products**
- In Washing Application

**Company Profile**
- Sales Offices

---

PEFM 78

PEFM 79

PEFM 8/8
# Company Profile

![KOSMEK LTD. Head Office](image)

<table>
<thead>
<tr>
<th>Company Name</th>
<th>KOSMEK LTD.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established</td>
<td>May 1986</td>
</tr>
<tr>
<td>Capital</td>
<td>¥99,000,000</td>
</tr>
<tr>
<td>Chairman</td>
<td>Keitaro Yonezawa</td>
</tr>
<tr>
<td>President</td>
<td>Tsutomu Shirakawa</td>
</tr>
<tr>
<td>Employee Count</td>
<td>250</td>
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<td>Group Company</td>
<td>KOSMEK LTD.</td>
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<tr>
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<td>KOSMEK ENGINEERING LTD.</td>
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<td>KOSMEK (USA) LTD.</td>
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<td>KOSMEK EUROPE GmbH</td>
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<td>KOSMEK (CHINA) LTD.</td>
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<td>KOSMEK LTD. - INDIA</td>
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<tr>
<td>Business Fields</td>
<td>Design, production and sales of precision products, and hydraulic and pneumatic equipment</td>
</tr>
<tr>
<td>Customers</td>
<td>Manufacturers of automobiles, industrial machinery, semiconductors and electric appliances</td>
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<tr>
<td>Banks</td>
<td>Resona bank, Tokyo-Mitsubishi bank, Ikeda bank</td>
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## Sales Offices across the World

<table>
<thead>
<tr>
<th>Country</th>
<th>Sales Offices</th>
<th>TEL.</th>
<th>FAX.</th>
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</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Overseas Sales</td>
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<td></td>
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<tr>
<td></td>
<td>KOSMEK (USA) LTD.</td>
<td>TEL.</td>
<td>+1-630-620-7650</td>
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<tr>
<td></td>
<td></td>
<td>FAX.</td>
<td>+1-630-620-9015</td>
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<tr>
<td>Mexico</td>
<td>KOSMEK USA Mexico Office</td>
<td>TEL.</td>
<td>+52-442-161-2347</td>
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<tr>
<td>EUROPE</td>
<td>KOSMEK EUROPE GmbH</td>
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<td>China</td>
<td>KOSMEK (CHINA) LTD.</td>
<td>TEL.</td>
<td>+86-21-54253000</td>
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<td>India</td>
<td>KOSMEK LTD. - INDIA</td>
<td>TEL.</td>
<td>+91-9880561695</td>
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<td>Thailand</td>
<td>Thailand Representative Office</td>
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<td>Taiwan</td>
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<td>PT. Yamata Machinery</td>
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<td>TEL.</td>
<td>+81-979-15162</td>
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<td>Head Office</td>
<td>Osaka Sales Office</td>
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<td>Tokyo Sales Office</td>
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<td>TEL.</td>
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<td>Nagoya Sales Office</td>
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<td>Fukuoka Sales Office</td>
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<td>TEL.</td>
<td>092-433-0424</td>
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<td>FAX.</td>
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## Sales Offices in Japan
Product Line-up

■ Quick Die Change Systems
FOR PRESS MACHINES

■ Kosmek Factory Automation Systems
FACTORY AUTOMATION INDUSTRIAL ROBOT RELATED PRODUCTS

■ Diecast Clamping Systems
FOR DIECAST MACHINES

■ Kosmek Work Clamping Systems
MACHINE TOOL RELATED PRODUCTS

■ Quick Mold Change Systems
FOR INJECTION MOLDING MACHINES
FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.

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