## Block Cylinder

**Model** DBA  
**Model** DBC

### Simple and Easily Mounted Linear Cylinder

Stroke: 25mm, 50mm

#### Double Action Linear Cylinder

Body Size: 4 Types  
Mounting Method: 2 Types  
Piping Method: 2 Types  
Stroke: 25mm, 50mm  

Hydraulic double action linear cylinder can be used with low to high pressure.

### Double Action Linear Cylinder

<table>
<thead>
<tr>
<th>Classification</th>
<th>Double Action Linear Cylinder Bolt Up Mounting</th>
<th>Double Action Linear Cylinder Side Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Range</td>
<td>1~35MPa</td>
<td>1~35MPa</td>
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</tbody>
</table>

#### Mounting Method

- **Model DBA**  
- **Model DBC**

#### Accessories

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
</table>
| DBA   | BZL, BZ, JZG  
※ For BZL, pressure range is 1~7MPa.  
※ For BZ, pressure range is 1~25MPa. | P.891 |
| DBC   | BZL, BZ, JZG  
※ For BZL, pressure range is 1~7MPa.  
※ For BZ, pressure range is 1~25MPa. | P.865 |
Application Examples

Released (Pushed) State

Released (Pulled) State

Locked (Pushed) State

Locked (Pulled) State

Sectional Structure

**DBA 0-B**: Piping Option

**DBA 0-C**: Gasket Option

**DBC 0-B**: Piping Option

**DBC 0-C**: Gasket Option
Block Cylinder

Model No. Indication

Bolt Up Mounting Model

**DBA 032 0 - C S**

1 Cylinder Inner Diameter

- **025**: Cylinder Inner Diameter φ 25
- **032**: Cylinder Inner Diameter φ 32
- **040**: Cylinder Inner Diameter φ 40
- **050**: Cylinder Inner Diameter φ 50

2 Design No.

- **0**: Revision Number

3 Piping Method

- **B**: Piping Option (G Thread)
- **C**: Gasket Option (With G Thread Plug)

※ Speed control valve (BZL) is sold separately.
It is used only when operating pressure is 7MPa or less.
Please refer to P.891.

4 Stroke Code

- **S**: Full Stroke 25mm
- **M**: Full Stroke 50mm

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>DBA0250</th>
<th>DBA0320</th>
<th>DBA0400</th>
<th>DBA0500</th>
</tr>
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<tbody>
<tr>
<td>Stroke Code</td>
<td>S M S M S M S M</td>
<td></td>
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<tr>
<td>Full Stroke</td>
<td>mm 25 50 25 50 25 50 25 50</td>
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<tr>
<td>Cylinder Area cm²</td>
<td>Push 4.9 8.0 12.6 19.6</td>
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<tr>
<td></td>
<td>Pull 2.9 4.9 7.7 11.6</td>
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<tr>
<td>Cylinder Force kN</td>
<td>Push P × 0.49 P × 0.80 P × 1.26 P × 1.96</td>
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<td></td>
<td>Pull P × 0.29 P × 0.49 P × 0.77 P × 1.16</td>
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<tr>
<td>Cylinder Capacity cm³</td>
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<tr>
<td></td>
<td>Pull 7.3 14.5 12.3 24.5 19.1 38.3 29.0 58.0</td>
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<tr>
<td>Cylinder Inner Diameter mm</td>
<td>Φ 25 Φ 32 Φ 40 Φ 50</td>
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<tr>
<td>Rod Diameter mm</td>
<td>Φ 16 Φ 20 Φ 25 Φ 32</td>
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<td>Max. Operating Pressure MPa</td>
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<td>Min. Operating Pressure MPa</td>
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<td>Withstanding Pressure MPa</td>
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<td>Operating Temperature °C</td>
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<tr>
<td>Usable Fluid</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
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<tr>
<td>Mass kg</td>
<td>1.1 1.5 1.7 2.3 2.3 3.0 3.8 5.0</td>
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</tbody>
</table>

Note: 1. Symbol of cylinder force (calculation formula) indicates P: Supply Hydraulic Pressure (MPa).
### External Dimensions

**DBA-0-B** : Piping Option

**DBA-0-C** : Gasket Option

### External Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Stroke Code</th>
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<td>G</td>
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<td>7</td>
<td>7</td>
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<tr>
<td>H</td>
<td>11.5</td>
<td>15</td>
<td>17</td>
<td>18</td>
<td></td>
</tr>
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<td>J</td>
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<td>12</td>
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<td>L</td>
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<td>9.3</td>
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<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q</td>
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<td>S</td>
<td>9</td>
<td>11</td>
<td>11.5</td>
<td></td>
<td></td>
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<tr>
<td>T (Nominal x Pitch x Depth)</td>
<td>M10x1.5x15</td>
<td>M12x1.75x18</td>
<td>M16x2.2x23</td>
<td>M20x2.5x28</td>
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<tr>
<td>V</td>
<td>32</td>
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<td>52</td>
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</tr>
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<td>W</td>
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</tr>
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<td>DB</td>
<td>14</td>
<td>14</td>
<td>19</td>
<td>19</td>
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<tr>
<td>DC*¹</td>
<td>φ3 Depth 5</td>
<td>φ5 Depth 5</td>
<td>φ5 Depth 5</td>
<td>φ5 Depth 5</td>
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<td>Hydraulic Port</td>
<td>~B Option</td>
<td>G1/8</td>
<td>G1/8</td>
<td>G1/4</td>
<td>G1/4</td>
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<tr>
<td>G Thread Plug</td>
<td>~C Option</td>
<td>G1/8</td>
<td>G1/8</td>
<td>G1/4</td>
<td>G1/4</td>
</tr>
<tr>
<td>O-ring</td>
<td>~C Option</td>
<td>1BP5</td>
<td>1BP7</td>
<td>1BP7</td>
<td>1BP7</td>
</tr>
</tbody>
</table>

Notes:
1. Mounting surface roughness of -C: Gasket option should be 6.35 or better.
2. Cylinder can be positioned with DC hole and spring pin.

*¹: Cylinder can be positioned with DC hole and spring pin.
Model No. Indication

Side Mounting Model

**DBC 032 0 - C S**

1 Cylinder Inner Diameter

- **025**: Cylinder Inner Diameter \( \phi 25 \)
- **032**: Cylinder Inner Diameter \( \phi 32 \)
- **040**: Cylinder Inner Diameter \( \phi 40 \)
- **050**: Cylinder Inner Diameter \( \phi 50 \)

2 Design No.

- **0**: Revision Number

3 Piping Method

- **B**: Piping Option (G Thread)
- **C**: Gasket Option (With G Thread Plug)

※ Speed control valve (BZL) is sold separately. It is used only when operating pressure is 7MPa or less. Please refer to P.891.

4 Stroke Code

- **S**: Full Stroke 25mm
- **M**: Full Stroke 50mm

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>DBC0250</th>
<th>DBC0320</th>
<th>DBC0400</th>
<th>DBC0500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke Code</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>Full Stroke</td>
<td>mm</td>
<td>25</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>Cylinder Area ( \text{cm}^2 )</td>
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<td>Push</td>
<td>4.9</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
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<td>Pull</td>
<td>2.9</td>
<td>4.9</td>
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<tr>
<td>Cylinder Force ( \text{kN} )</td>
<td></td>
<td>Push</td>
<td>( P \times 0.49 )</td>
<td>( P \times 0.80 )</td>
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<tr>
<td>(Calculation Formula)</td>
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<td>Pull</td>
<td>( P \times 0.29 )</td>
<td>( P \times 0.49 )</td>
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<tr>
<td>Cylinder Capacity ( \text{cm}^3 )</td>
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<td>Push</td>
<td>12.3</td>
<td>24.5</td>
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<tr>
<td></td>
<td></td>
<td>Pull</td>
<td>7.3</td>
<td>14.5</td>
</tr>
<tr>
<td>Cylinder Inner Diameter</td>
<td>mm</td>
<td>( \phi 25 )</td>
<td>( \phi 32 )</td>
<td>( \phi 40 )</td>
</tr>
<tr>
<td>Rod Diameter</td>
<td>mm</td>
<td>( \phi 16 )</td>
<td>( \phi 20 )</td>
<td>( \phi 25 )</td>
</tr>
<tr>
<td>Max. Operating Pressure</td>
<td>MPa</td>
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<td></td>
</tr>
<tr>
<td>Min. Operating Pressure</td>
<td>MPa</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withstanding Pressure</td>
<td>MPa</td>
<td>42.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>°C</td>
<td>0 ~ 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usable Fluid</td>
<td></td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>kg</td>
<td>1.1</td>
<td>1.5</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Note: 1. Symbol of cylinder force (calculation formula) indicates \( P \): Supply Hydraulic Pressure (MPa).
External Dimensions

**DBC 0-B : Piping Option**

**DBC 0-C : Gasket Option**

### Table: External Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>DBC0250</th>
<th>DBC0320</th>
<th>DBC0400</th>
<th>DBC0500</th>
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<tbody>
<tr>
<td>Stroke Code</td>
<td>S</td>
<td>M</td>
<td>S</td>
<td>M</td>
</tr>
<tr>
<td>A</td>
<td>58</td>
<td>70</td>
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<td>100</td>
</tr>
<tr>
<td>B</td>
<td>42</td>
<td>50</td>
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</tr>
<tr>
<td>C</td>
<td>69</td>
<td>78</td>
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<tr>
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<td>18</td>
</tr>
<tr>
<td>F</td>
<td>56</td>
<td>63</td>
<td>88</td>
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<td>G</td>
<td>6</td>
<td>6.5</td>
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</tr>
<tr>
<td>H</td>
<td>11.5</td>
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<td>18</td>
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</tr>
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<tr>
<td>R</td>
<td>24</td>
<td>30</td>
<td>36</td>
<td>46</td>
</tr>
</tbody>
</table>

T (Nominal x Pitch x Depth) | M10 x 1.5 x 15 | M12 x 1.75 x 18 | M16 x 2 x 23 | M20 x 2.5 x 28 |
| Y | 42 | 50 | 60 | 76 |
| BA | 23 | 27 | 32 | 34 |
| BB | 33 | 58 | 61 | 64 |
| BC | 14 | 17.5 | 17.5 | 20 |
| BD | 9 | 11 | 11 | 13.5 |
| BE | 8.5 | 10.5 | 10.5 | 12.5 |
| CA | 8 | 8 | 10 | 13 |
| CB | 4 | 5 | 5 | 5 |
| DA | 3 | 3 | 4 | 4 |
| DB | 14 | 14 | 19 | 19 |

Hydraulic Port: –B Option | G1/8 | G1/8 | G1/4 | G1/4 |
G Thread Plug: –C Option | G1/8 | G1/8 | G1/4 | G1/4 |
O-ring: –C Option | 18PS | 18P7 | 18P7 | 18P7 |

Notes: 1. Mounting surface roughness of -C: Gasket option should be 6.35 or better.
   2. When using it with push side pressure more than 15MPa and pull side pressure more than 25MPa, install the stopper as shown in the drawing.
Cautions

- **Notes for Design**

  1) Check Specifications
  - Please use each product according to its specifications.

  2) Notes for Circuit Design
  - Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P.1238 to assist with proper hydraulic circuit designing. Improper circuit design will lead to applications malfunction and damages.
  - Ensure there is no possibility of supplying hydraulic pressure to the push and pull ports simultaneously.

  3) Notes for Piping Design
  - It is recommended that you select large diameter pipes. The back pressure is proportional to the pipe size, so if the pipes are small the release and lock times will be longer.

  4) When using on a welding fixture, the exposed area of piston rod should be protected.
  - If spatter gets onto the sliding surface it could lead to malfunction and fluid leakage.

  5) The load direction given to the piston rod.
  - Make sure no force is applied to the piston rod outside the axial direction. Uses like the one shown in the figure below (marked with ×) will apply a large bending stress to the piston rod and must be avoided.

  When force is applied from other than the axial direction.

![Diagram of force application](image)

When clamping workpieces with different heights

![Diagram of workpiece clamping](image)

No Spherical Washer

With Spherical Washer

6) When clamping on a sloped surface on the workpiece.
  - When clamping an inclined surface the design should be such that when looking from the clamp side the clamp area is level. Make sure the clamp surface and clamp mounting surface are parallel. Workpieces may move and piston rods may slip when clamps are used on inclined surfaces.
  - (When the workpiece is a casting, it is recommended that spiked attachments be used for clamps on draft angles.)

![Diagram of sloped surface clamping](image)

7) Speed Control Valve Installation
  - Speed control valves for low pressure listed below are available for DBA0-0-C, DBC0-0-C piping model.
  - Speed control valve for high pressure (B7T) cannot be used.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Speed Control Valve Model No.</th>
<th>Max. Operating Pressure when using BZL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBA/DBC0250-C</td>
<td>B2L0100-8</td>
<td>7MPa</td>
</tr>
<tr>
<td>DBA/DBC0320-C</td>
<td>B2L0100-8</td>
<td>7MPa</td>
</tr>
<tr>
<td>DBA/DBC0400-C</td>
<td>B2L0200-8</td>
<td>7MPa</td>
</tr>
<tr>
<td>DBA/DBC0500-C</td>
<td>B2L0200-8</td>
<td>7MPa</td>
</tr>
</tbody>
</table>

8) DBC: Stopper Installation
  - Install push side stopper when using it with push side pressure more than 15MPa.
  - Install pull side stopper when using it with pull side pressure more than 25MPa.
  - Refer to the external dimensions for the stopper dimensions.
Installation Notes

1) Check the Usable Fluid
   Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1237).

2) Mounting the Cylinder
   When mounting the cylinder, use hexagon socket bolts for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the table below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

<table>
<thead>
<tr>
<th>Model No</th>
<th>Nominal x Pitch</th>
<th>Number of Mounting Bolts</th>
<th>Tightening Torque (N-m)</th>
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</thead>
<tbody>
<tr>
<td>DBA0250</td>
<td>M8 x 1.25</td>
<td>4</td>
<td>25</td>
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<tr>
<td>DBA0320</td>
<td>M10 x 1.5</td>
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<td>50</td>
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<td>DBA0500</td>
<td>M12 x 1.75</td>
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<td>80</td>
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<td>M8 x 1.25</td>
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<td>50</td>
</tr>
<tr>
<td>DBC0500</td>
<td>M12 x 1.75</td>
<td>2</td>
<td>80</td>
</tr>
</tbody>
</table>

3) Installation / Removal of Attachment
   When installing or removing an attachment, use a wrench on the piston rod to keep it from turning. When installing or removing an attachment, tighten it with the torque shown in the chart below.

<table>
<thead>
<tr>
<th>Model No</th>
<th>Thread Size</th>
<th>Tightening Torque (N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBA/DBC0250</td>
<td>M10 x 1.5</td>
<td>50</td>
</tr>
<tr>
<td>DBA/DBC0320</td>
<td>M12 x 1.75</td>
<td>100</td>
</tr>
<tr>
<td>DBA/DBC0400</td>
<td>M16 x 2</td>
<td>200</td>
</tr>
<tr>
<td>DBA/DBC0500</td>
<td>M20 x 2.5</td>
<td>315</td>
</tr>
</tbody>
</table>

4) Speed Adjustment
   Adjust the rod operating speed less than 100mm/sec both the push and pull operation.
   If the cylinder operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
   Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed accurately with air mixed in the circuit.
   Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

※ Please refer to P.1237 for common cautions.
Control Valve

Model BZL
Model BZT
Model BZX
Model JZG

Directly mounted to clamps, flow control valve • Air bleeding • plug

- Directly mounted to clamps
  Flow control valve, air bleeding valve, G-thread plug for G-thread (-C option) directly mounted.
<table>
<thead>
<tr>
<th>Operating Pressure Range</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7MPa or less</td>
<td>Adjust the flow by wrench. It can adjust the clamping action speed individually.</td>
</tr>
<tr>
<td>35MPa or less</td>
<td>Air bleeding in the circuit is possible by loosening flow control valve.</td>
</tr>
<tr>
<td>25MPa or less</td>
<td>Air bleeding in the circuit is possible by wrench.</td>
</tr>
<tr>
<td>35MPa or less</td>
<td>Air bleeding in the circuit is possible by loosening G thread plug.</td>
</tr>
</tbody>
</table>

**Speed Control Valve (For Low Pressure)**

**Model BZL**

→ P.893

**Speed Control Valve (For High Pressure)**

**Model BZT**

→ P.897

**Air Bleed Valve**

**Model BZX**

→ P.899

**G Thread Plug**

**Model JZG**

→ P.901
Control Valve  
**Speed Control Valve (For Low Pressure)**  
**model BZL**

#### Model No. Indication (Speed Control Valve for Low Pressure)

**BZL 0 101 - B**

1. **G Thread Size**
   - 10: Thread Part G1/8A Thread
   - 20: Thread Part G1/4A Thread
   - 30: Thread Part G3/8A Thread

2. **Design No.**
   - 1: Revision Number

3. **Control Method**

<table>
<thead>
<tr>
<th>A</th>
<th>Circuit Symbol: Meter-in</th>
<th>B</th>
<th>Circuit Symbol: Meter-out</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1 port</td>
<td>Hydraulic Pressure Supply Side</td>
<td>P2 Port</td>
<td>Clamp Side</td>
</tr>
<tr>
<td>P1 port</td>
<td>Hydraulic Pressure Supply Side</td>
<td>P2 Port</td>
<td>Clamp Side</td>
</tr>
</tbody>
</table>

4. **Specifications**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>BZL0101-A</th>
<th>BZL0201-A</th>
<th>BZL0301-A</th>
<th>BZL0101-B</th>
<th>BZL0201-B</th>
<th>BZL0301-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Pressure</td>
<td>MPa</td>
<td>7</td>
<td>10.5</td>
<td>G1/8A</td>
<td>G1/4A</td>
<td>G3/8A</td>
</tr>
<tr>
<td>Withstanding Pressure</td>
<td>MPa</td>
<td>0.04</td>
<td>0.12</td>
<td>G1/8A</td>
<td>G1/4A</td>
<td>G3/8A</td>
</tr>
<tr>
<td>G Thread Size</td>
<td>mm²</td>
<td>2.6</td>
<td>5.0</td>
<td>11.6</td>
<td>2.6</td>
<td>5.0</td>
</tr>
<tr>
<td>Max. Passage Area</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>°C</td>
<td>0 ~ 70</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tightening Torque for Main Body</td>
<td>N·m</td>
<td>10</td>
<td>25</td>
<td>35</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Weight</td>
<td>g</td>
<td>12</td>
<td>26</td>
<td>48</td>
<td>12</td>
<td>26</td>
</tr>
</tbody>
</table>

**Notes:**
1. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
2. Don’t use BZL to other clamps.
   - Flow control will not be made because the bottom depth difference of G thread makes metal seal insufficient.
### Applicable Products

<table>
<thead>
<tr>
<th>Model No.</th>
<th>LHE (Double Action) High-Power Swing Clamp</th>
<th>LHS (Double Action) Swing Clamp</th>
<th>LHW (Double Action) Swing Clamp</th>
<th>LT (Single Action) Swing Clamp</th>
<th>LG (Single Action) Swing Clamp</th>
<th>LKA (Double Action) Link Clamp</th>
<th>LKC (Double Action) Link Clamp</th>
<th>LKE (Double Action) High-Power Link Clamp</th>
</tr>
</thead>
</table>

### Note:
1. Flow control circuit for double action cylinder should have meter-out circuits for both the lock and release sides (except model LKE/TLA/TMA). Meter-in circuits can be adversely affected by any air in the system.

---

**Control Valve Digest**  
**Model No. Indication**  
**Specifications**  
**Applicable Products**  
**Flow Rate Graph**  
**External Dimensions**

---

**High-Power Series**  
**Hydraulic Series**  
**Valve / Coupler Hydraulic Unit**  
**Manual Operation Accessories**  
**Cautions / Others**  
**Hole Clamp**  
**Swing Clamp**  
**LHA**  
**LHC**  
**LHW**  
**LT/LG**  
**T2A-1**  
**T2B-2**  
**T1A-2**  

---

**Link Clamp**  
**LEA**  
**LKC**  
**LKW**  
**LM/LJ**  
**TMA-2**  
**TMA-1**  
**Work Support**  
**LD**  
**LC**  
**TC**  
**Air Sensing Lift Cylinder**  
**LLW**  
**Compact Cylinder**  
**LLR**  
**LLU**  
**DP**  
**DS**  

---

**Block Cylinder**  
**DBA**  
**DBC**  
**Centering Vise**  
**FVA**  
**FVD**  
**FVC**  

---

**Control Valve BZL**  
**BZT**  
**BZX/JZG**  
**Pallet Clamp**  
**VS**  
**VT**  
**Expansion Locating Pin**  
**VFL**  
**VPF**  
**VFJ**  
**VFK**  

---

**Pull Stud Clamp**  
**FP**  
**FQ**  
**Customized Spring Cylinder**  
**DWA/DWB**

---

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Flow Rate Graph <Hydraulic Fluids ISO-VG32 (25〜35°C)>

BZL0101-A : Meter-in
Controlled Flow Direction

- Closed Number of Turns of Adjusting Screw Opened

Free Flowing Direction

BZL0201-A : Meter-in
Controlled Flow Direction

- Closed Number of Turns of Adjusting Screw Opened

Free Flowing Direction

BZL0301-A : Meter-in
Controlled Flow Direction

- Closed Number of Turns of Adjusting Screw Opened

Free Flowing Direction

BZL0101-B : Meter-out
Controlled Flow Direction

- Closed Number of Turns of Adjusting Screw Opened

Free Flowing Direction

BZL0201-B : Meter-out
Controlled Flow Direction

- Closed Number of Turns of Adjusting Screw Opened

Free Flowing Direction

BZL0301-B : Meter-out
Controlled Flow Direction

- Closed Number of Turns of Adjusting Screw Opened

Free Flowing Direction
### External Dimensions

![Diagram of External Dimensions]

### Machining Dimensions of Mounting Area

![Diagram of Machining Dimensions]

#### Notes:
1. Since the $\varphi V$ area is sealing part, be careful not to damage it.
2. Since the $\varphi T$ area is the metal sealing part of BZL, be careful not to damage it (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply and P2 port as the clamp side.
5. If mounting plugs or fittings with $G$ thread specification available in the market, the dimension ‘$H$’ should be 12.5.

### Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Circuit" to assist with proper hydraulic circuit design.
   
   If there is something wrong with the circuit design, it leads to the applications malfunction and damage. (Refer to P.1238)

2. It is dangerous to air bleed during operation under high pressure. It must be done under lower pressure.
   
   (For reference: the minimum operating range of the product within the circuit.)
Model No. Indication (Air Bleed Valve)

BZX0 10

1 G Thread Size

1 : Thread Part G1/8A Thread
2 : Thread Part G1/4A Thread
3 : Thread Part G3/8A Thread

2 Design No.

0 : Revision Number

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>BZX010</th>
<th>BZX020</th>
<th>BZX030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Pressure MPa</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withstanding Pressure MPa</td>
<td>37.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Thread Size</td>
<td>G1/8A</td>
<td>G1/4A</td>
<td>G3/8A</td>
</tr>
<tr>
<td>Usable Fluid</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature °C</td>
<td>0 ~ 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tightening Torque for Main Body N·m</td>
<td>10</td>
<td>25</td>
<td>35</td>
</tr>
</tbody>
</table>

Notes:

1. Do not over loosen the plug during air venting. (Do not loosen for more than 2 turns from the fully closed position.)
2. It is dangerous to have air venting operation under high pressure. It must be done under lower pressure. (For reference: the minimum operation pressure range of the product within the circuit)
3. Refer to the machining dimensions for B2L mounting area.
Applicable Products

<table>
<thead>
<tr>
<th>Model No.</th>
<th>LHE (Double Action) High-Power Swing Clamp</th>
<th>LHS (Double Action) Swing Clamp</th>
<th>LHW (Double Action) Swing Clamp</th>
<th>LT (Single Action) Swing Clamp</th>
<th>LG (Single Action) Swing Clamp</th>
<th>LKA (Double Action) Link Clamp</th>
<th>LKC (Double Action) Link Clamp</th>
<th>LKE (Double Action) High-Power Link Clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>BZX010</td>
<td>LHE0300-C</td>
<td>LHS0300-C</td>
<td>LHW0300-C</td>
<td>LT0301-C</td>
<td>LG0301-C</td>
<td>LKA0301-C</td>
<td>LKC0301-C</td>
<td>LKE0301-C</td>
</tr>
<tr>
<td></td>
<td>LHE0360-C</td>
<td>LHS0360-C</td>
<td>LHW0360-C</td>
<td>LT0361-C</td>
<td>LG0361-C</td>
<td>LKA0361-C</td>
<td>LKC0361-C</td>
<td>LKE0361-C</td>
</tr>
<tr>
<td></td>
<td>LHE0400-C</td>
<td>LHS0400-C</td>
<td>LHW0400-C</td>
<td>LT0401-C</td>
<td>LG0401-C</td>
<td>LKA0401-C</td>
<td>LKC0401-C</td>
<td>LKE0401-C</td>
</tr>
<tr>
<td></td>
<td>LHE0450-C</td>
<td>LHS0450-C</td>
<td>LHW0450-C</td>
<td>LT0451-C</td>
<td>LG0451-C</td>
<td>LKA0451-C</td>
<td>LKC0451-C</td>
<td>LKE0451-C</td>
</tr>
<tr>
<td></td>
<td>LHE0500-C</td>
<td>LHS0500-C</td>
<td></td>
<td>LT0501-C</td>
<td>LG0501-C</td>
<td>LKA0501-C</td>
<td>LKC0501-C</td>
<td>LKE0501-C</td>
</tr>
<tr>
<td></td>
<td>LHE0550-C</td>
<td></td>
<td></td>
<td>LT0551-C</td>
<td>LG0551-C</td>
<td>LKA0551-C</td>
<td>LKC0551-C</td>
<td>LKE0551-C</td>
</tr>
<tr>
<td>BZX020</td>
<td>LHS0650-C</td>
<td>LHS0650-C</td>
<td>LHS0750-C</td>
<td>LT0651-C</td>
<td>LG0651-C</td>
<td>LKA0651-C</td>
<td>LKC0651-C</td>
<td>LKE0651-C</td>
</tr>
<tr>
<td></td>
<td>LHS0750-C</td>
<td>LHS0750-C</td>
<td></td>
<td>LT0751-C</td>
<td>LG0751-C</td>
<td>LKA0751-C</td>
<td>LKC0751-C</td>
<td>LKE0751-C</td>
</tr>
<tr>
<td>BZX030</td>
<td>LHS0900-C</td>
<td>LHS1050-C</td>
<td></td>
<td>LT0901-C</td>
<td>LG1050-C</td>
<td>LKA1050-C</td>
<td>LKC1050-C</td>
<td>LKE1050-C</td>
</tr>
</tbody>
</table>

External Dimensions

<table>
<thead>
<tr>
<th>Model No.</th>
<th>BZX010</th>
<th>BZX020</th>
<th>BZX030</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>B</td>
<td>15.5</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>C</td>
<td>19.8</td>
<td>20.6</td>
<td>20.6</td>
</tr>
<tr>
<td>D</td>
<td>9.5</td>
<td>10.1</td>
<td>10.1</td>
</tr>
<tr>
<td>E</td>
<td>5.5</td>
<td>6.3</td>
<td>6.3</td>
</tr>
<tr>
<td>G</td>
<td>G1/8</td>
<td>G1/4</td>
<td>G3/8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lock Nut M6 (3 types)</th>
<th>Exclusive Packing (Included)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Clamp / Cylinder)</td>
</tr>
</tbody>
</table>

Control Valve

- BZL
- BZT
- BZX/2Z

Pallet Clamp

- V5
- VT

Expansion Location Pin

- VF1
- VF2
- VF3
- VF4
- VFK

Pull Stud Clamp

- FP
- FQ

Customized Spring Cylinder

- DWA/DWB
Model No. Indication (G Thread Plug with Air Bleeding Function)

**J ZG0 1 0**

1 **G Thread Size**

1 : Thread Part G1/8A Thread
2 : Thread Part G1/4A Thread
3 : Thread Part G3/8A Thread

2 **Design No.**

0 : Revision Number

### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>JZG010</th>
<th>JZG020</th>
<th>JZG030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Pressure MPa</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withstanding Pressure MPa</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Thread Size</td>
<td>G1/8A</td>
<td>G1/4A</td>
<td>G3/8A</td>
</tr>
<tr>
<td>Usable Fluid</td>
<td>General Hydraulic Oil Equivalent to ISO-VG-32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature °C</td>
<td>0 ~ 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tightening Torque for Main Body N·m</td>
<td>10</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>Female Thread Side Material : Steel</td>
<td>8</td>
<td>20</td>
<td>28</td>
</tr>
</tbody>
</table>

Notes:
1. It is dangerous to have air venting operation under high pressure. It must be done under lower pressure. (For reference: the minimum operation pressure range of the product within the circuit)
2. Refer to the machining dimensions for BZL mounting area.
3. Body material of LT/LM is aluminum alloy, so install it with the tightening torque for aluminum.
### Applicable Products

<table>
<thead>
<tr>
<th>Model No.</th>
<th>DBA (Double Action) Block Cylinder</th>
<th>DBC (Double Action) Block Cylinder</th>
<th>FVA (Double Action) Centering Vise</th>
<th>FVC (Double Action) Centering Vise</th>
<th>FVD (Double Action) Centering Vise</th>
</tr>
</thead>
<tbody>
<tr>
<td>JZG010</td>
<td>D8A0250-C*</td>
<td>D8A0320-C*</td>
<td>FVA0401</td>
<td>FVA0631</td>
<td>FV0630</td>
</tr>
<tr>
<td>JZG020</td>
<td>D8A0400-C*</td>
<td>D8A0500-C*</td>
<td>FV1000</td>
<td>FV1600</td>
<td>FV04000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model No.</th>
<th>LC (Single Action) Work Support</th>
<th>LHA (Double Action) Swing Clamp</th>
<th>LHC (Double Action) Swing Clamp</th>
<th>LHE (Double Action) High-Power Swing Clamp</th>
<th>LHS (Double Action) Swing Clamp</th>
<th>LHW (Double Action) Swing Clamp</th>
<th>LT (Single Action) Link Clamp</th>
<th>LG (Single Action) Link Clamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>JZG010</td>
<td>LC0262-C</td>
<td>LHA0360-C</td>
<td>LHC0360-C</td>
<td>LHE0360-C</td>
<td>LHS0360-C</td>
<td>LHW0400-C</td>
<td>LT0301-C</td>
<td>LG0301-C</td>
</tr>
<tr>
<td>JZG020</td>
<td>LC0752-C</td>
<td>LHA0650-C</td>
<td>LHC0550-C</td>
<td>LHE0550-C</td>
<td>LHS0550-C</td>
<td>LHW0650-C</td>
<td>LT0650-C</td>
<td>LG0650-C</td>
</tr>
<tr>
<td>JZG30</td>
<td>LHA0900-C</td>
<td>LHA1050-C</td>
<td>LHC0900-C</td>
<td>LHE0900-C</td>
<td>LHS0900-C</td>
<td>LHW0900-C</td>
<td>LT0900-C</td>
<td>LG0900-C</td>
</tr>
</tbody>
</table>

### External Dimensions

**Exclusive Packing (Included)**

- Hex. Socket D
- φ A

<table>
<thead>
<tr>
<th>Model No.</th>
<th>JZG010</th>
<th>JZG020</th>
<th>JZG30</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>B</td>
<td>3.5</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>G1/8A</td>
<td>G1/4A</td>
<td>G3/8A</td>
</tr>
</tbody>
</table>
Cautions

Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid
   ● Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping
   ● The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
   ● The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
   ● There is no filter provided with Kosmek's product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.

3) Applying Sealing Tape
   ● Wrap with tape 1 to 2 times following the screw direction.
   ● Pieces of the sealing tape can lead to oil leakage and malfunction.
   ● In order to prevent a foreign substance from going into the product during the piping work, it should be carefully cleaned before working.

4) Air Bleeding of the Hydraulic Circuit
   ● If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.

   ① Reduce hydraulic pressure to less than 2MPa.
   ② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
   ③ Wiggle the pipeline to loosen the outlet of pipe fitting.
      Hydraulic fluid mixed with air comes out.

   ④ Tighten the cap nut after bleeding.
   ⑤ It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit.
      (Set an air bleeding valve at the highest point inside the circuit.)

5) 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.

Hydraulic Fluid List

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maker</td>
<td>Anti-Wear Hydraulic Oil</td>
</tr>
<tr>
<td>Showa Shell Sekiyu</td>
<td>Tellus S2 M 32</td>
</tr>
<tr>
<td>Idemitsu Kosan</td>
<td>Daphne Hydraulic Fluid 32</td>
</tr>
<tr>
<td>JX Nippon Oil &amp; Energy</td>
<td>Super Hyrando 32</td>
</tr>
<tr>
<td>Cosmo Oil</td>
<td>Cosmo Hydro AW32</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>Mobil DYE 24</td>
</tr>
<tr>
<td>Matsumura Oil</td>
<td>Hydol AW-32</td>
</tr>
<tr>
<td>Castrol</td>
<td>Hyspin AWS 32</td>
</tr>
</tbody>
</table>

Note: As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.
Notes on Hydraulic Cylinder Speed Control Unit

Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder
For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.

Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)

Flow Control Valve

Flow Control at the Release Side

Flow Control Circuit for Double Acting Cylinder
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system. However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.

Refer to P.75 for speed adjustment of LKE.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

[Meter-out Circuit] (Except LKE/TMA/TLA)

In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

1. Single acting components should not be used in the same flow control circuit as the double acting components. The release action of the single acting cylinders may become erratic or very slow.

Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

Separate the control circuit.

Reduce the influence of double acting cylinder control unit. However, due to the back pressure in tank line, single action cylinder is activated after double action cylinder works.

In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection, if the back pressure is more than the set pressure then the system will not work as it is designed to.

Flow Control Valve
(Any location is OK)
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 machine unless the safety protocols are ensured.

- The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.

3) Before the machine 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.

4) After stopping the machine, do not remove until the temperature cools down.

5) 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 equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source

- Before the machine 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 and plunger.

- 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) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VFL/VFM/VFJ/VFK/VWS/VWM/VWK/VX/VXF)

- Location products, except VX/VXF model, can remove contaminants with cleaning functions.

- When installing pallets makes sure there is no thick sludge like substances on pallets.

- Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.

4) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.

5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) 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.

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

9) 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, or 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.
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Asia Detailed Map

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