Air Valve Unit
For T-Slot Automatic-Slide Hydraulic Clamp
Model MV30

Air Valve Unit for GKE/GKF Automatic-Slide Clamp
Compact air valve unit controls the air cylinder of the automatic slide clamps.

The air directional control valve is actuated by an electrical signal. The GKE / GKF clamp slides automatically with the air cylinder.

Application Example
The drawing shows the air flow direction when controlling the push and pull sides of the air cylinder with the MV Air Valve Unit.
Model No. Indication

**MV3023 - SS - 5 - N**

1 **Size Code**
   1: For Small/Medium Clamp
   2: For Large Clamp

2 **Design No.**
   3: Revision Number

3 **Circuit Symbol**
   S: Slider Circuit
      (Solenoid Valve: 3 Position Exhaust Center)
   T: Slider Circuit
      (Solenoid Valve: 2 Position Double)

Circuit Symbol Example

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Circuit Type</th>
<th>Application Example</th>
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<tbody>
<tr>
<td>SS</td>
<td>2 Slider Circuits</td>
<td>Stationary Platen + Movable Platen</td>
</tr>
<tr>
<td>SSS</td>
<td>3 Slider Circuits</td>
<td>Stationary Platen 2 Circuits + Movable Platen 1 Circuit</td>
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Notes:
1. For Option N: NPT Port, the dimensions in the specification sheet and other documents are in inches.
2. Please contact us when using a large number of clamps.

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>MV3013</th>
<th>MV3023</th>
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<tbody>
<tr>
<td>Valve</td>
<td>Metal Seal / Five-Port Pilot Operated</td>
<td></td>
</tr>
<tr>
<td>Position/Number of Solenoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Circuit Symbol S</td>
<td>Three-Position Exhaust Center</td>
<td></td>
</tr>
<tr>
<td>3 Circuit Symbol T</td>
<td>Two-Position Double</td>
<td></td>
</tr>
<tr>
<td>Effective Area</td>
<td>mm²</td>
<td>15</td>
</tr>
<tr>
<td>Usable Fluid</td>
<td>Dry Air</td>
<td></td>
</tr>
<tr>
<td>Max. Operating Pressure</td>
<td>MPa</td>
<td>1.0</td>
</tr>
<tr>
<td>Withstanding Pressure</td>
<td>MPa</td>
<td>1.5</td>
</tr>
<tr>
<td>Operating (Fluid) Temperature</td>
<td>°C</td>
<td>-10 ~ +60</td>
</tr>
<tr>
<td>Oil Supply</td>
<td>No Oil Supply</td>
<td></td>
</tr>
<tr>
<td>Solenoid Valve (SMC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Circuit Symbol S</td>
<td>VFS2400</td>
<td></td>
</tr>
<tr>
<td>3 Circuit Symbol T</td>
<td>VFS2200</td>
<td></td>
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<tr>
<td>Note:</td>
<td></td>
<td></td>
</tr>
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</table>
| ※2. Please supply filtered clean dry air.
**External Dimensions**

※ This drawing shows MV3013.

<table>
<thead>
<tr>
<th>Number of Circuits</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>120</td>
<td>105</td>
<td>88</td>
<td>46</td>
</tr>
<tr>
<td>3</td>
<td>150</td>
<td>135</td>
<td>116</td>
<td>47</td>
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</tbody>
</table>

Note:
1. Please contact us for the dimensions for one circuit model.
External Dimensions

This drawing shows MV3023.

Number of Circuits | A | B | C | D
---|---|---|---|---
2  | 150 | 130 | 112 | 58.5
3  | 185 | 165 | 145 | 59.5

Note:
1. Please contact us for the dimensions for one circuit model.
**Cautions**

**Notes for Design**

1) Check Specifications
- Please use each product according to its specifications.
- Operating hydraulic pressure is 25 MPa.
  - Do not use clamps with excessive operating pressure.
  - Falling down of the mold due to the damage on clamps leads to injury accident. In order to reduce clamping force, use them with lower operating pressure.

2) Check the thickness of the mold clamping part.
- Please check the thickness of the mold clamping part.
- If using molds other than specified, clamps cannot conduct locking action normally leading to injury accident.

3) The clamp surface and T-slot must be parallel to mounting surface of the mold.
- If clamp surface is not even or parallel, excessive force is applied to the clamp and it deforms main body and lever of the clamp resulting in falling off of the clamp and injury accident.

4) Make sure that advance/retraction of the clamp is smoothly conducted.
  - (model GKE / GKF)
  - Please control air cylinder for slide with two-position double solenoid (with detent).
  - Supply more than 0.4MPa air pressure to air cylinder.
  - Please adjust the moving speed of the clamp with speed controller to fully stroke within 1 to 2 seconds.
  - Do not set the limit switch to the mold surface near the U-slot, because it is used as forward-end detection.
  - The clamp sliding surface must be smooth (without any bumps).

5) Make sure that dust, sand, cutting chips or blank pieces do not enter the clamp.
- Clamp does not operate smoothly and may be damaged.

6) When the clamp cylinder sticks out of U-slot or T-slot, please use it within the allowable protrusion amount.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Allowable Protrusion Amount (mm)</th>
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<tbody>
<tr>
<td>GKB0100 / GKC0100</td>
<td>17.5</td>
</tr>
<tr>
<td>GKB0160 / GKC0160</td>
<td>21</td>
</tr>
<tr>
<td>GKB0250 / GKC0250</td>
<td>25</td>
</tr>
<tr>
<td>GKB0400 / GKC0400 / GKE0400 / GKF0400</td>
<td>32</td>
</tr>
<tr>
<td>GKB0630 / GKC0630 / GKE0630 / GKF0630</td>
<td>39</td>
</tr>
<tr>
<td>GKB1000 / GKC1000 / GKE1000 / GKF1000</td>
<td>45</td>
</tr>
<tr>
<td>GKB1600 / GKC1600 / GKE1600 / GKF1600</td>
<td>57</td>
</tr>
<tr>
<td>GKB2500 / GKC2500 / GKE2500 / GKF2500</td>
<td>69.5</td>
</tr>
<tr>
<td>GKB4000 / GKC4000 / GKE4000 / GKF4000</td>
<td>0</td>
</tr>
<tr>
<td>GKS5000 / GKC5000 / GKE5000 / GKF5000</td>
<td>0</td>
</tr>
</tbody>
</table>
Installation Notes

1) Check the fluid to use.
2) Please use the appropriate fluid by referring to the Hydraulic Fluid List.
3) If using hydraulic oil having viscosity higher than viscosity grade ISO-VG-32, action time will be longer.
4) If using it at low temperature, action time will be longer because the viscosity of hydraulic oil becomes higher.

Procedure before piping

1) 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.
2) (The filter which removes contaminant in the hydraulic piping or hydraulic system is not provided.)

Applying sealing tape

1) Wrap with tape 1 to 2 times following the screwing direction.
2) When piping, be careful that contaminants such as sealing tape do not enter in products.
3) Pieces of the sealing tape can lead to air leaks and malfunction.

Air bleeding in the hydraulic circuit

1) 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 conduct air bleeding with the end of the piping.
2) Reduce hydraulic supply pressure to less than 2MPa.
3) Please loosen the cap nut of pipe fitting that is closest to clamps by one turn.
4) Wiggle the pipeline to loosen the outlet of pipeline fitting.
5) The hydraulic fluid mixed with air comes out.

Air tightness and Re-tightening

1) At the beginning of the machine installation, the bolt/nut may be tightened lightly.
2) Check torque and re-tighten as required.

Mounting the Clamp

1) After setting the clamp in the T-slot, use attached hex. socket bolts and tighten it with the torque shown below (model GKE / GKF).
2) Wiring of the Forward-End Confirmation Switch
3) Make sure there is enough slack in the wire so that the clamp can complete the sliding action without putting tension on the wire.

Hydraulic Fluid List

1) Please use appropriate fluid referring to the fluid lists below.
2) Select the same fluid as Fluid Code of hydraulic clamp and unit.
3) General Hydraulic Oil
4) Anti-Wear Hydraulic Oil
5) Multi-Purpose Hydraulic Oil
6) ISO Viscosity Grade ISO-VG-32
7)Showa Shell Sekiyu Tellus S2 M 32 Morinssa 32 B 32
8)Idemitsu Kosan Daphne Hydraulic Fluid 32 Daphne Multi Oil 32
9)JX Nippon Oil & Energy Super Hyranndo 32 Super Mulups DX 32
10)Cosmo Oil Cosmo Hydro AWS 32 Cosmo New Mighty Super 32
11)ExxonMobil Mobil DTE 24 Mobil DTE 24 Light
12)Matsuruma Oil Hydol AW-32
13)Castrol Hyspin AWS 32

Water • Glycol

1) ISO Viscosity Grade ISO-VG-32
2) JX Nippon Oil & Energy Hyranto FRZ 32
3) Cosmo Oil Cosmo Fluid HQ46
4) Matsuruma Oil Hydol HAW32

Silicon Oil

1) ISO Viscosity Grade ISO-VG-68
2) Shin-Etsu Chemical KF-50-100cs

Fatty Acid Ester

1) ISO Viscosity Grade
2) Showa Shell Sekiyu Shell Ius Fluids DU56 (ISO-VG-56)
3) Idemitsu Kosan Firgisi E5 (ISO-VG-56)
4) JX Nippon Oil & Energy Hyrando SS56 (ISO-VG-56)
5) Cosmo Oil Cosmo Fluid E46 (ISO-VG-46)
6) Nippon Quaker Chemical Quintolubric 822-200 (ISO-VG-46)

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.

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.

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.

Sequence Valve

Flow Control Valve
(Any location is OK)
Notes on Handling

1) When stopping a machine, make sure no load is applied on clamps. Otherwise, a mold may fall causing an injury accident.
2) It should be handled by qualified personnel.
   ● The hydraulic machine should be handled and maintained by qualified personnel.
3) Do not handle or remove the machine 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 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 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.
5) Do not touch clamps while they are working.
   ● Otherwise, your hands may be injured due to clinching.
6) If there is a change for mold width, make sure to check the allowable protrusion amount.
   ● If exceeding the allowable protrusion amount, excessive force is applied on clamps leading to deformation or dislocation which cause falling of a mold or an injury accident.
   Please refer to "Notes for Design 6" for allowable protrusion amount.
7) Please hold the main body of the clamp when moving or removing it.
   ● If pulling on hydraulic hose or air tube, the clamp will fall off leading to injury accident. Also, rivet part of the hose will be loosened leading to fluid leakage.
8) Do not disassemble or modify.
   ● If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.
9) Do not get water or oil onto the equipment.
   ● It may lead to malfunction or deterioration of the product and cause an accident.

Maintenance • 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 equipment.
   ● 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) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
4) Regularly tighten bolts and pipe line, mounting bolts, nuts, circlips and cylinders to ensure proper use.
5) Make sure the hydraulic fluid has not deteriorated.
6) 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.
7) The products should be stored in the cool and dark place without direct sunshine or moisture.
8) 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 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.
### Sales Offices across the World

<table>
<thead>
<tr>
<th>Region</th>
<th>Country</th>
<th>TEL.</th>
<th>FAX.</th>
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<td>Overseas Sales</td>
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<tr>
<td>Japan</td>
<td>KOSMEK LTD.</td>
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<td>+81-78-991-8787</td>
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<tr>
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<td>KOSMEK (USA) LTD.</td>
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<td>+1-630-620-9015</td>
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<td>KOSMEK USA Mexico Office</td>
<td>+52-442-161-2347</td>
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<td>KOSMEK EUROPE GmbH</td>
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<td>KOSMEK (CHINA) LTD.</td>
<td>+86-21-54253000</td>
<td>+86-21-54253709</td>
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<tr>
<td>India</td>
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<tr>
<td>Thailand</td>
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<tr>
<td>Taiwan</td>
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<tr>
<td>Philippines</td>
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<tr>
<td>Indonesia</td>
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### Sales Offices in Japan

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<td>+81-566-74-8778</td>
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