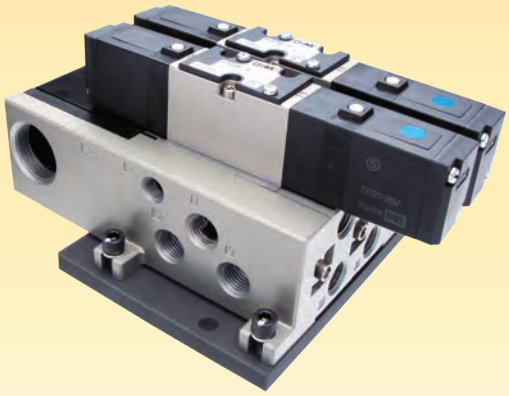
Air Valve Unit

For T-Slot Automatic-Slide Hydraulic Clamp

Model MV



Air Valve Unit for GKE/GKF Automatic-Slide Clamp

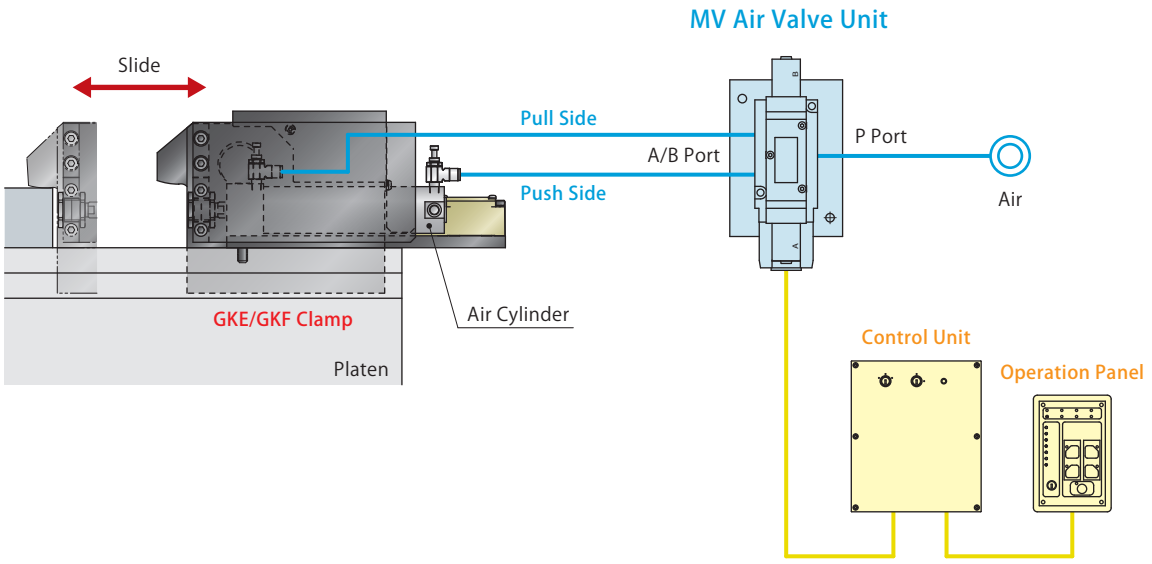
Compact air valve unit controls the air cylinder of the automatic slide clamps.

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

MV30 **2** **3** - **SS** - **5** - **4** - **N**

1 2 3 4 5 6

1 Size Code

1 : For Small/Medium Clamp
2 : For Large Clamp
3 : For Large Clamp
(Reference:
The diameter of air cylinder for slide ϕ80 or more.
GKE400/GKE500/GKF400/GKF500)

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)

4 Valve Control Voltage

1 : AC 100 V
2 : AC 200 V
3 : AC 110 V
4 : AC 220 V
5 : DC 24 V

5 Operating Air Pressure

Blank: Free Set Pressure
3 : 0.3MPa
4 : 0.4MPa
5 : 0.5MPa

6 Option

Blank: Standard
C : — Common
N : NPT Port ※1
R : With Silencer
S : Solenoid Valve with Light and Surge Voltage Suppressor

● Circuit Symbol Example (3-Position Exhaust Center)

Symbol	Circuit Type	Application Example
SS	2 Slider Circuits	Stationary Side + Movable Side, or Cross Circuit
SSS	3 Slider Circuits	Stationary Side : 1 Circuit + Movable Side : Cross Circuit

Notes :
※1. For 6 Option **N** : NPT Port, the dimensions in the specification sheet and other documents are in inches.
1. Please contact us when using a large number of clamps.

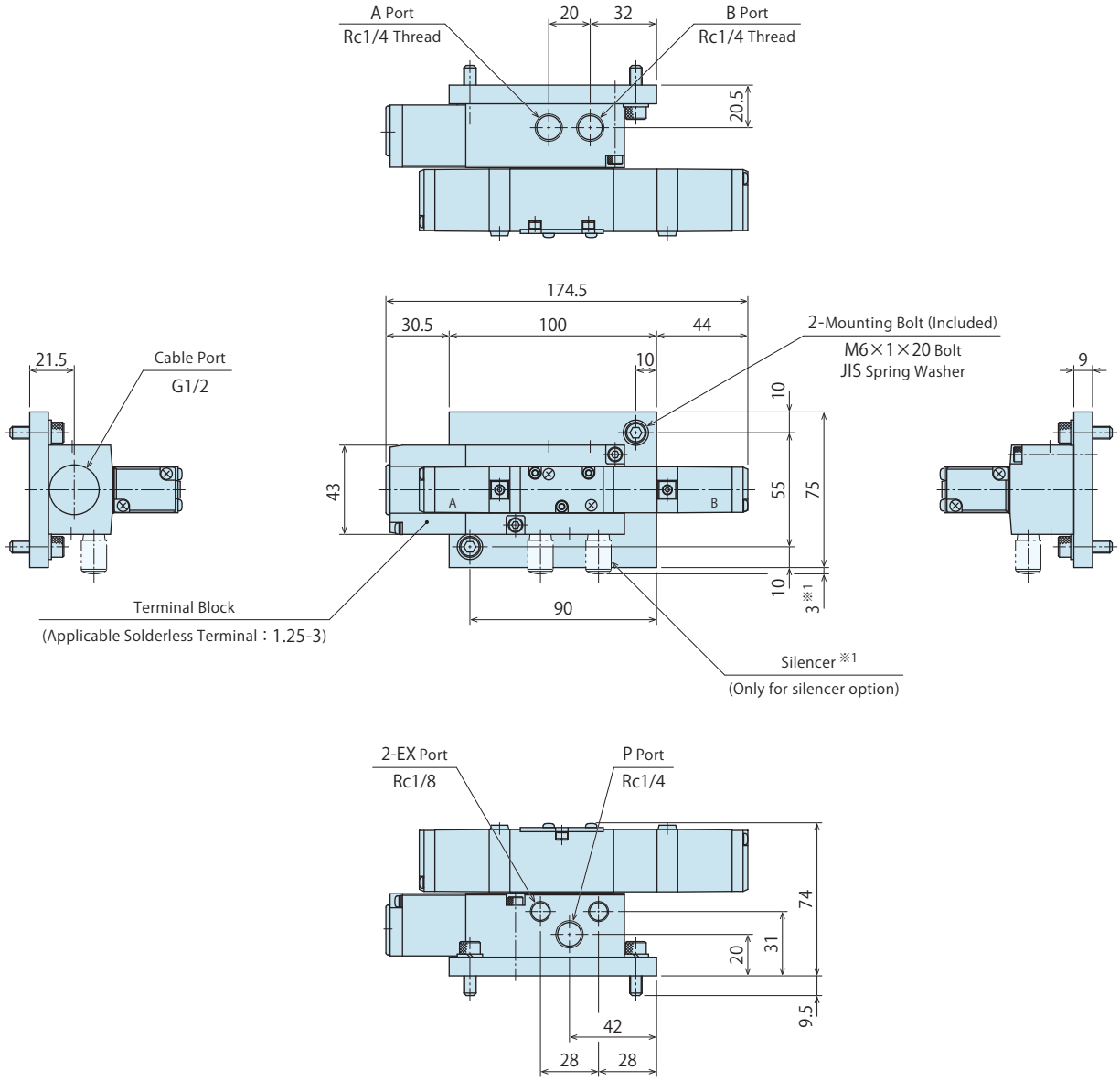
Specifications

Model No.		MV3013	MV3023	MV3033
Valve		Metal Seal / 5-Port Pilot Operated		
The Number of Positions / Solenoids	3 Circuit Symbol **S**	3-Position Exhaust Center		
	3 Circuit Symbol **T**	2-Position Double		
Effective Area	mm^2	15	36	36
Usable Fluid		Dry Air ※2		
Max. Operating Pressure	MPa	1.0		
Withstanding Pressure	MPa	1.5		
Operating (Fluid) Temperature	℃	−10 ~ +60		
Oil Supply		No Oil Supply		
Protection		Dust Proof		
Solenoid Valve (SMC)	3 Circuit Symbol **S**	VFS2400	VFS3400	VFS4400
	3 Circuit Symbol **T**	VFS2200	VFS3200	VFS4200

Note :
※2. Please supply filtered clean dry air.

External Dimensions：MV3013 (The Number of Circuits：1)

※ This drawing shows MV3013-□-□ (The number of circuits：1).

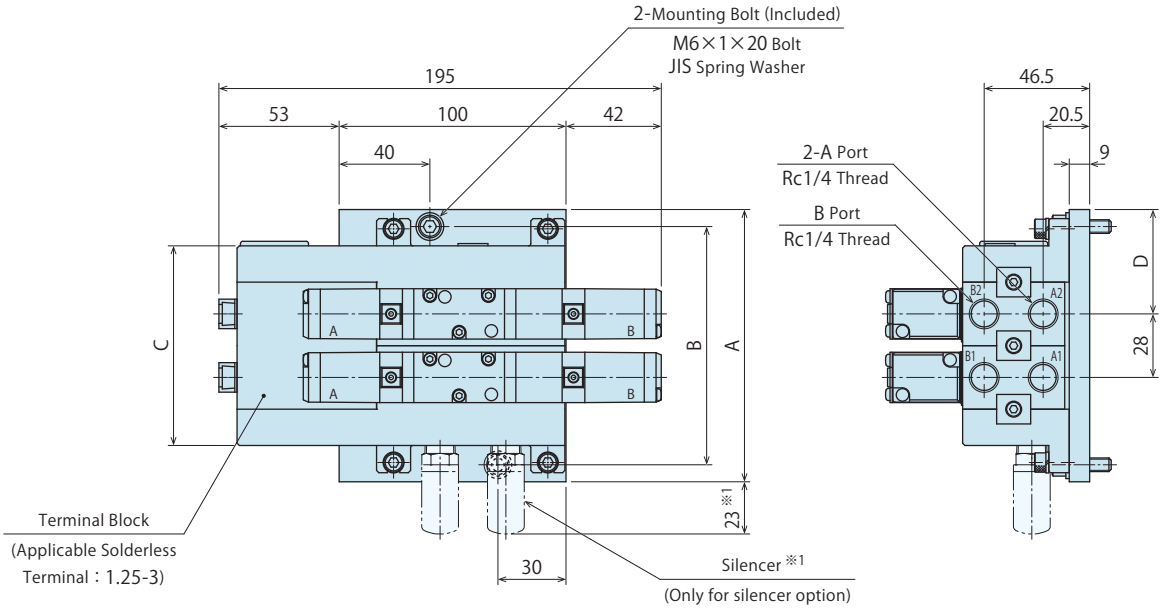


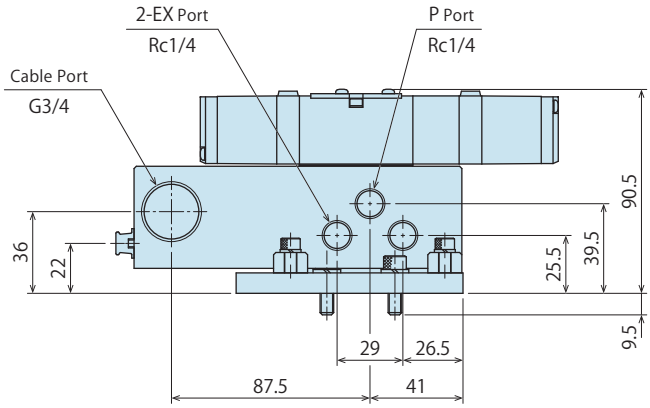
Notes :

※1. It is for 6 Option **R**：with Silencer.

External Dimensions：MV3013 (The Number of Circuits：2 / 3)

※ This drawing shows MV3013-□-□ (The number of circuits：2 / 3).





(mm)

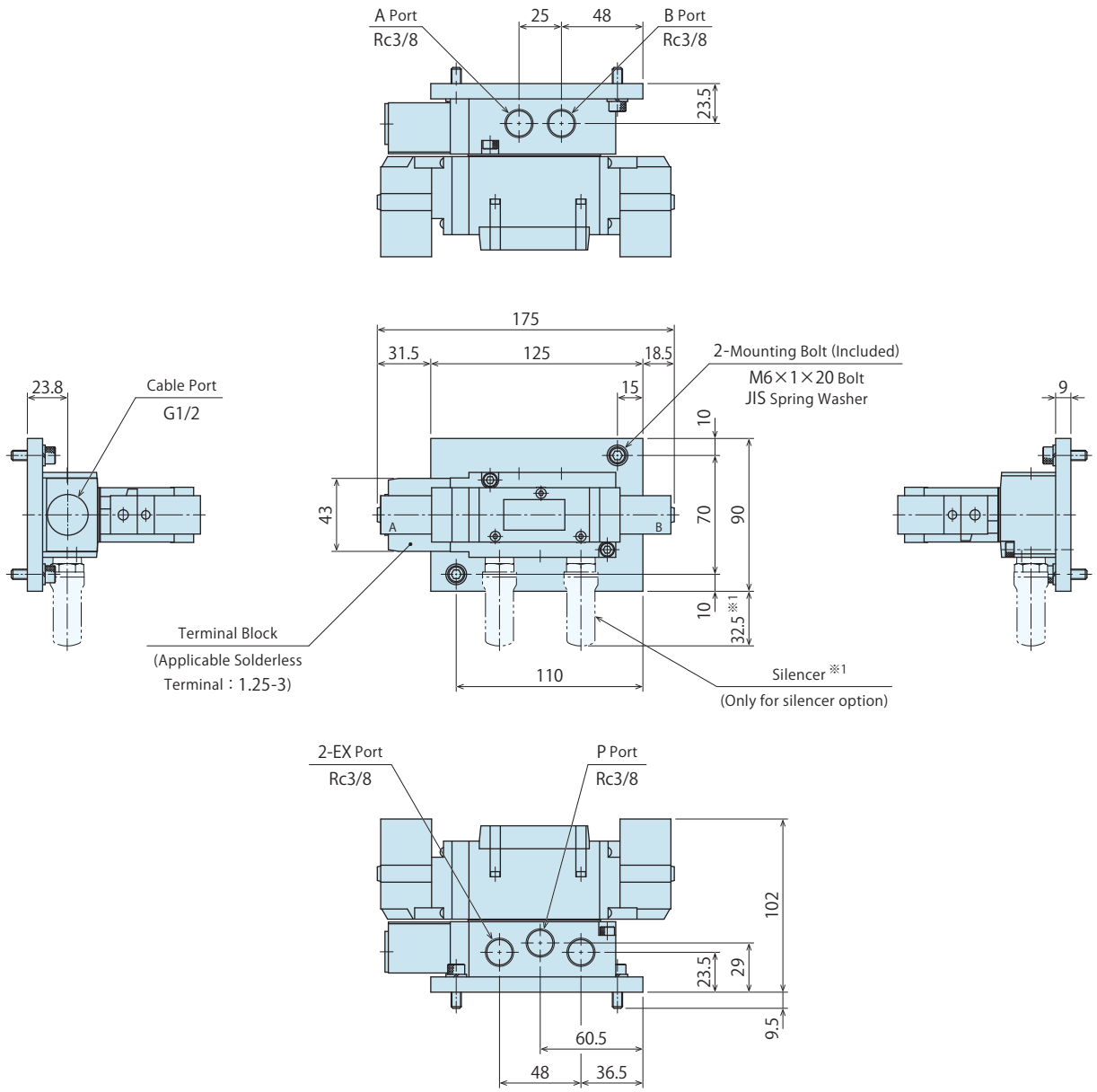
Number of Circuits	A	B	C	D
2	120	105	88	46
3	150	135	116	47

Notes :

※1. It is for 6 Option **R**：with Silencer.

External Dimensions：MV3023 (The Number of Circuits：1)

※ This drawing shows MV3023-□-□ (The number of circuits：1).

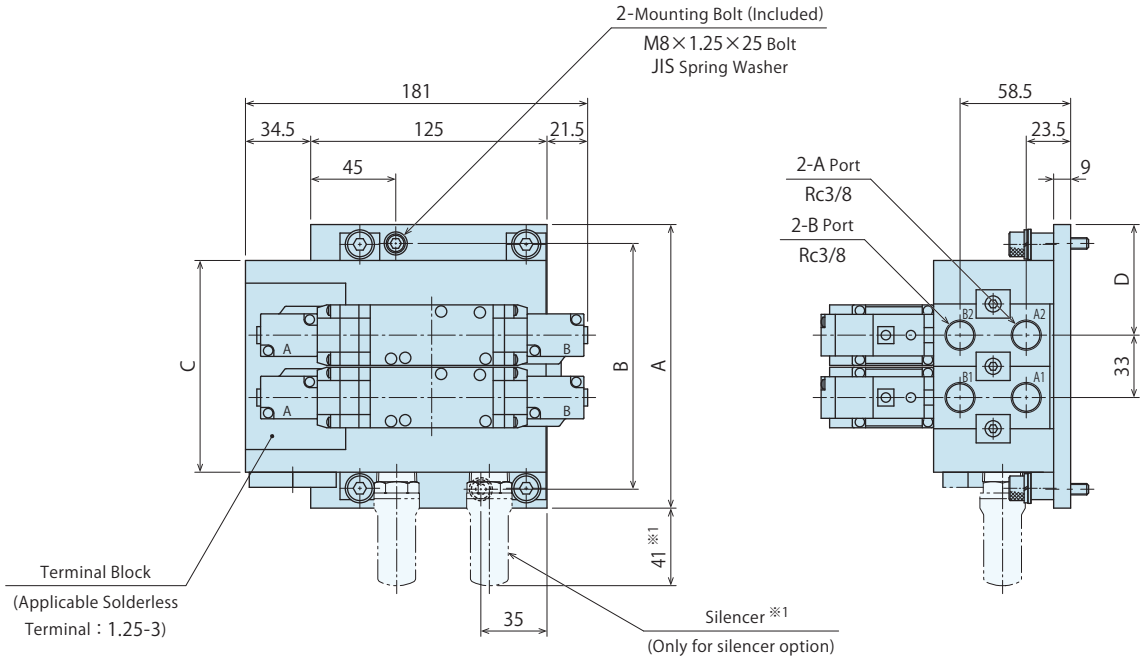


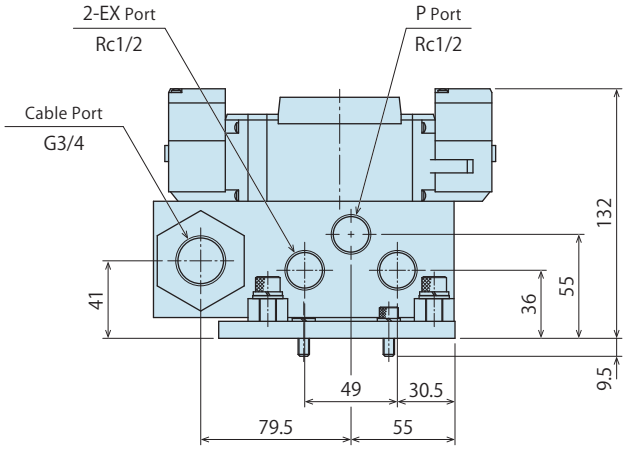
Notes :

※1. It is for 6 Option **R**：with Silencer.

External Dimensions：MV3023 (The Number of Circuits：2 / 3)

※ This drawing shows MV3023-□-□ (The number of circuits：2 / 3).





(mm)

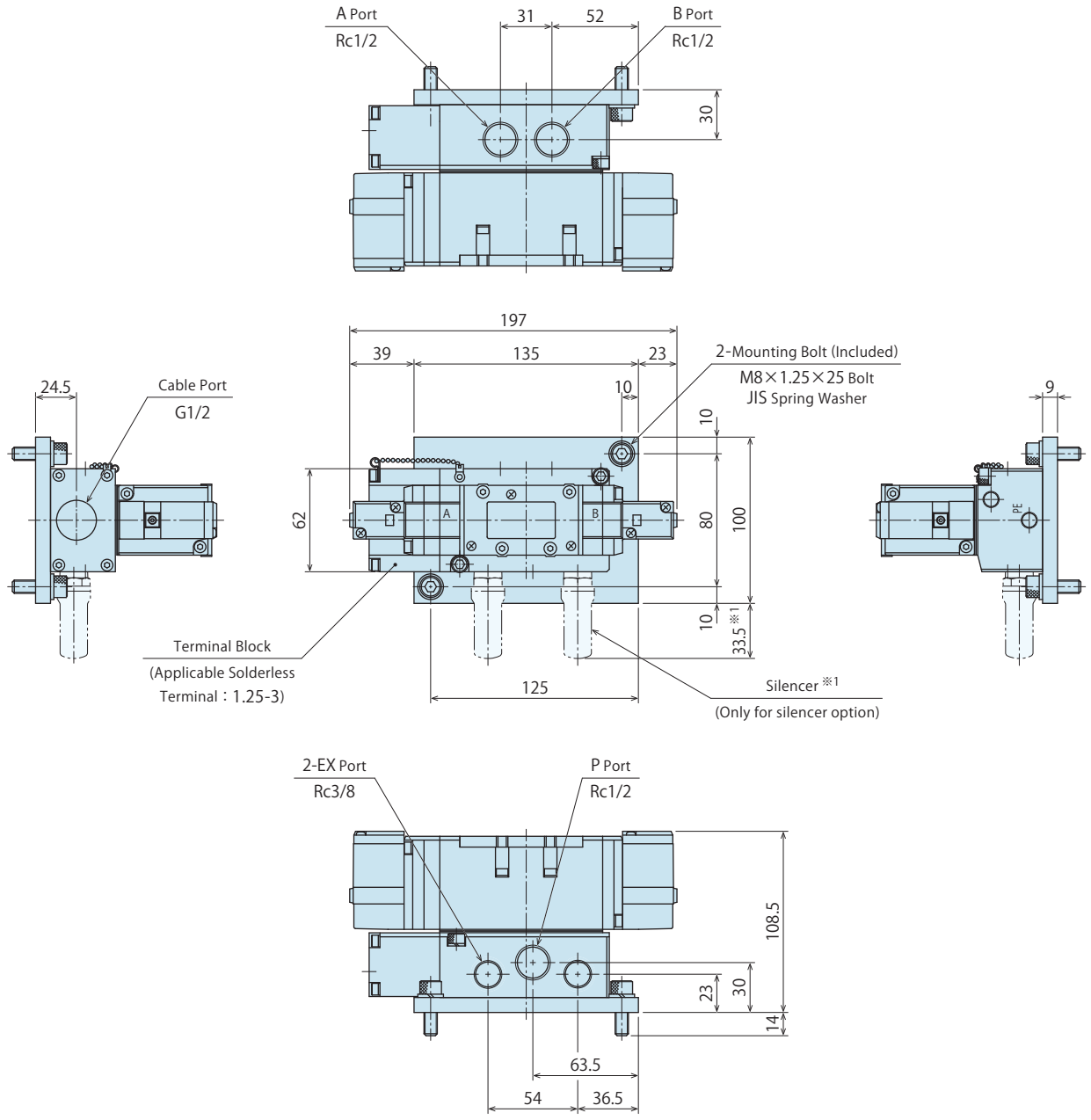
Number of Circuits	A	B	C	D
2	150	130	112	58.5
3	185	165	145	59.5

Notes :

※1. It is for 6 Option **R**：with Silencer.

External Dimensions：MV3033 (The Number of Circuits：1)

※ This drawing shows MV3033-□-□ (The number of circuits：1).

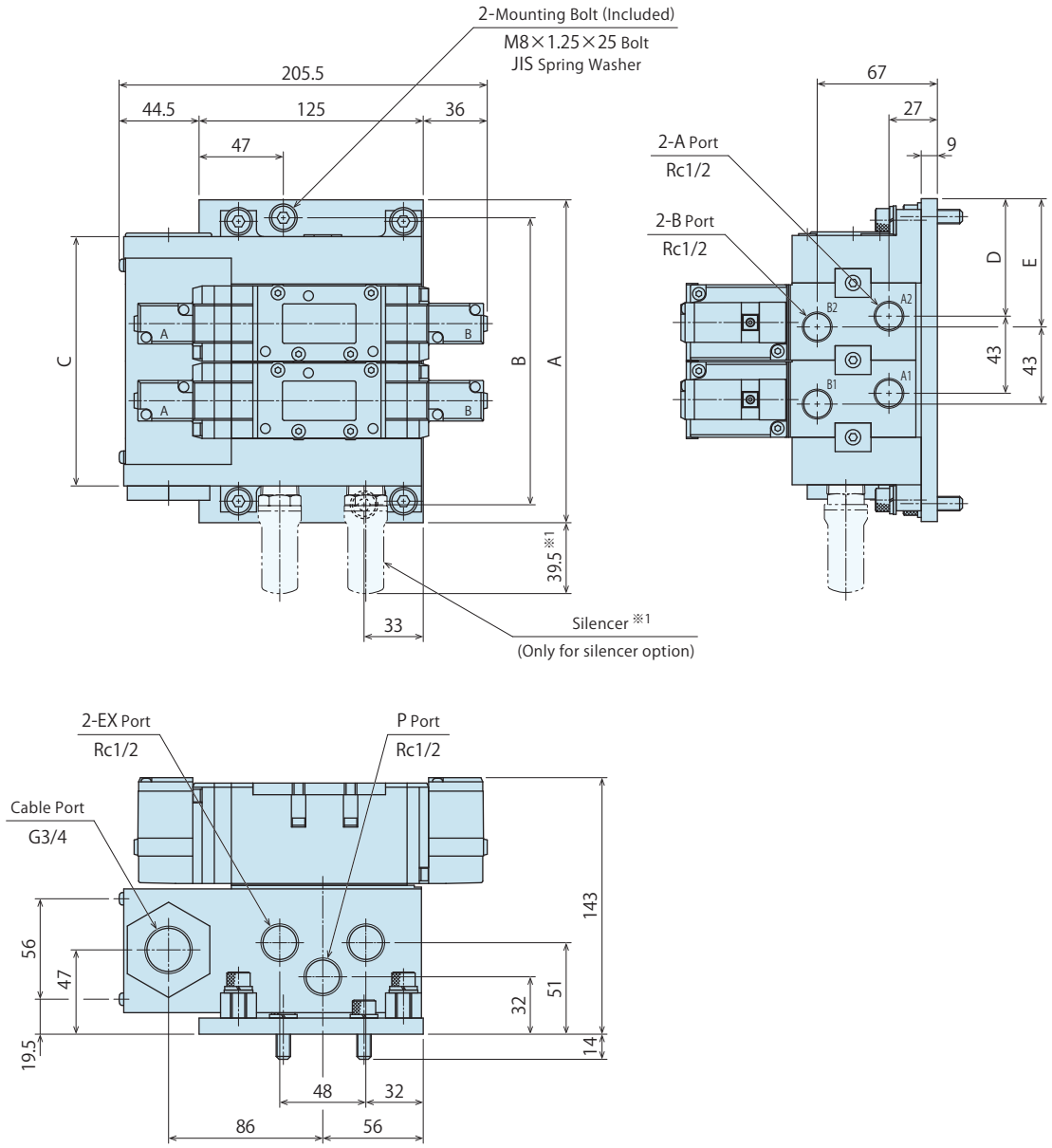


Notes :

※1. It is for 6 Option **R**：with Silencer.

External Dimensions：MV3033 (The Number of Circuits：2 / 3)

※ This drawing shows MV3033-□-□ (The number of circuits：2 / 3).



(mm)

Number of Circuits	A	B	C	D	E
2	180	160	139	65.5	71.5
3	225	205	182	66.5	72.5

Notes :

※1. It is for 6 Option **R**：with Silencer.

Hydraulic Clamp
Hydraulic Unit
Operation Panel Control Unit
Cautions Company Profile

Hydraulic Clamp
GKB
GKC
GKE
GKF

Hydraulic Unit
CPB/CPD
/CPC/CPE
CQC/CQE
CTB/CTD
/CTC/CTE
CUC/CUE

Air Valve Unit
MV

Operation Panel Control Unit
YMD

Cautions
Notes on Design
Installation Notes
Hydraulic Fluid List
Notes on Hyd. Cylinder Speed Control Circuit
Notes on Handling
Maintenance/Inspection
Warranty

Our Products
QMCS
QDCS
KWCS
FA and Industrial Robot Related Products

Company Profile
Company Profile
History
Sales Offices

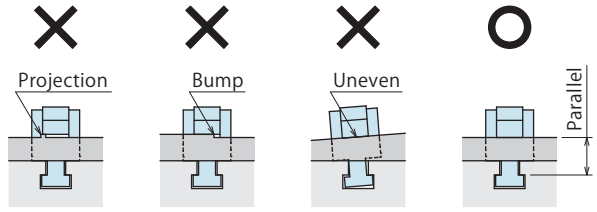
Cautions

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 properly leading to injury accident.

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

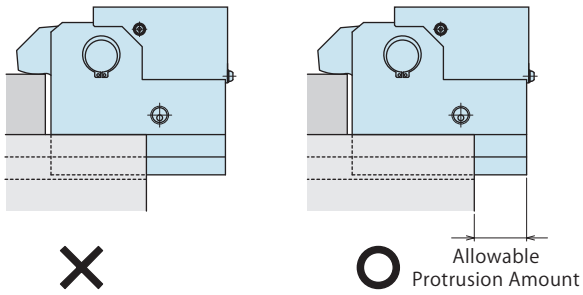


4) Make sure that advance/retraction of the clamp is smoothly conducted. (model GKE / GKF)
- Please control air cylinder for slide with 2-position double solenoid (with detent).
- Supply more than 0.4MPa air pressure to air cylinder.
- Please adjust the moving speed of the clamp with speed controller 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.

Model GKB / GKC / GKE / GKF



Allowable Protrusion Amount

Model No.	Allowable Protrusion Amount (mm)
GKB0100 / GKC0100	17.5
GKB0160 / GKC0160	21
GKB0250 / GKC0250	25
GKB0400 / GKC0400 / GKE0400 / GKF0400	32
GKB0630 / GKC0630 / GKE0630 / GKF0630	39
GKB1000 / GKC1000 / GKE1000 / GKF1000	45
GKB1600 / GKC1600 / GKE1600 / GKF1600	57
GKB2500 / GKC2500 / GKE2500 / GKF2500	69.5
GKB4000 / GKC4000 / GKE4000 / GKF4000	0
GKB5000 / GKC5000 / GKE5000 / GKF5000	0

Installation Notes

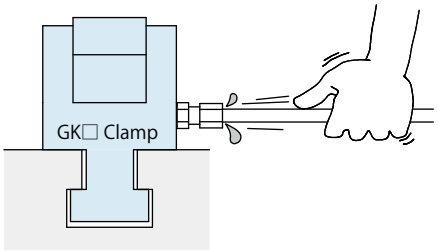
1) Check the fluid to use.
- Use the appropriate fluid by referring to the Hydraulic Fluid List.
- If using hydraulic oil having viscosity higher than viscosity grade ISO-VG-32, action time will be longer.
- If using it at low temperature, action time will be longer because the viscosity of hydraulic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

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

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

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



④ Tighten the cap nut after air bleeding.
⑤ It is more effective to release air at the highest point inside the circuit or at the end of the circuit.

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

6) Installation of the Clamp
- After setting the clamp in the T-slot, use attached hex. socket bolts and tighten them with the torque shown below (model GKE/GKF).

Model No.	Thread Size	Tightening Torque (N·m)
GKE0400 / GKF0400	M5×0.8	6.3
GKE0630 / GKF0630	M6×1	10
GKE1000 / GKF1000	M8×1.25	25
GKE1600 / GKF1600	M10×1.5	50
GKE2500 / GKF2500	M12×1.75	80
GKE4000 / GKF4000	M16×2	200
GKE5000 / GKF5000	M16×2	200

7) Wiring of the Forward-End Confirmation Switch
- 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

- Please use appropriate fluid referring to the fluid lists below.
- Select the same fluid as Fluid Code of hydraulic clamp and unit.

General Hydraulic Oil

ISO Viscosity Grade ISO-VG-32

Maker	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New Mighty Super 32
ExxonMobil	Mobil DTE 24	Mobil DTE 24 Light
Matsumura Oil	Hydol AW-32	–
Castrol	Hyspin AWS 32	–

Water・Glycol

ISO Viscosity Grade ISO-VG-32

Maker	Water・Glycol
JX Nippon Oil & Energy	Hyrando FRZ32
Cosmo Oil	Cosmo Fluid HQ46
Matsumura Oil	Hydol HAW32

Silicon Oil

ISO Viscosity Grade ISO-VG-68

Maker	Silicon Oil
Shin-Etsu Chemical	KF-50-100cs

Fatty Acid Ester

Maker	Fatty Acid Ester	ISO Viscosity Grade
Showa Shell Sekiyu	Shell Irus Fluids DU56	(ISO-VG-56)
Idemitsu Kosan	Firgist ES	ISO-VG-68
JX Nippon Oil & Energy	Hyrando SS56	(ISO-VG-56)
Cosmo Oil	Cosmo Fluid E46	ISO-VG-46
Nippon Quaker Chemical	Quintolubric 888 46	ISO-VG-46

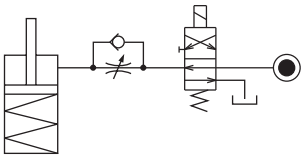
Note : Please contact manufacturers when customers require products in the list above.

● Notes on Hydraulic Cylinder Speed Control Unit

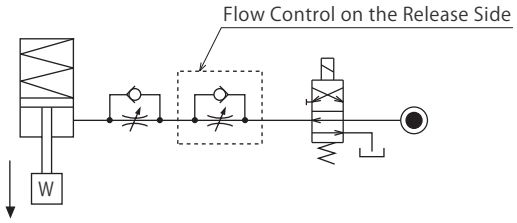
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

●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 only using a flow control valve with a check valve.
It is also preferred to provide a flow control valve at each actuator.



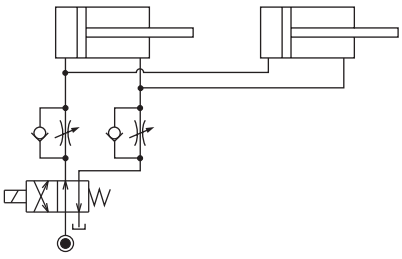
If a load is applied in the direction of release action during release, which may damage the cylinder, use a flow control valve with a check valve to control the flow rate on the release side as well.



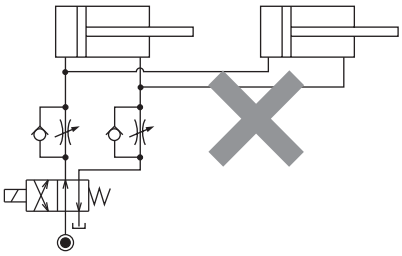
● Flow Control Circuit for Double Acting Cylinder

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.

【Meter-out Circuit】

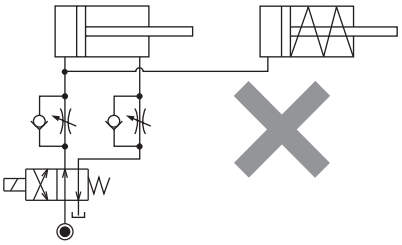


【Meter-in Circuit】



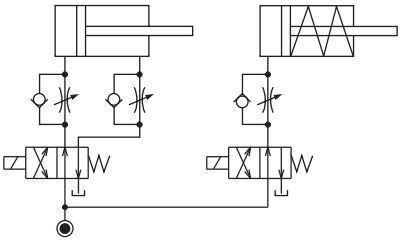
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

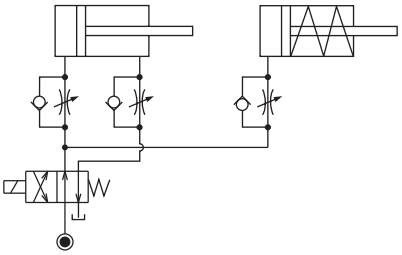


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

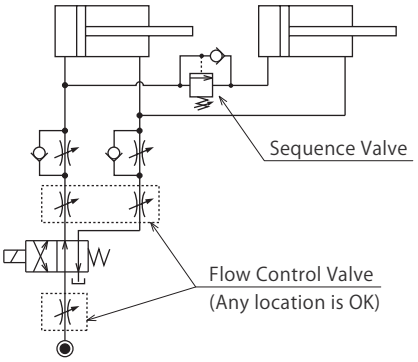
○ Separate the control circuit.



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



② 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.



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 operated by qualified personnel.
- The hydraulic machine should be operated and maintained by qualified personnel.

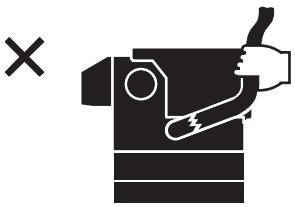
3) Do not operate or remove the machine unless the safety protocols are ensured.

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

4) Do not touch clamps while they are working.
- Otherwise, your hands may be injured.

5) 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.

6) 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.



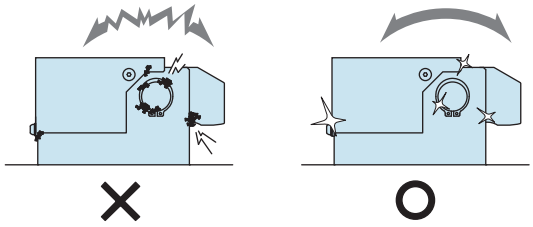
7) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

8) Do not pour water / oil over the product.
- It may lead to malfunction or deterioration of the product and cause an accident.

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
- Before removing the product, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Regularly clean the area around the product.
- If it is used when the surface is contaminated with dirt, it may lead to malfunctioning and fluid leakage.



3) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.
4) Regularly tighten 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 a smooth action without an irregular 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 Failure caused by the use of the non-confirming state at the user's discretion.
③ If it is used or operated 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.

Hydraulic Clamp
Hydraulic Unit
Operation Panel Control Unit
Cautions Company Profile

Hydraulic Clamp
GKB
GKC
GKE
GKF

Hydraulic Unit
CPB/CPD /CPC/CPE
CQC/CQE
CTB/CTD /CTC/CTE
CUC/CUE

Air Valve Unit
MV

Operation Panel Control Unit
YMD

Cautions
Notes on Design
Installation Notes
Hydraulic Fluid List
Notes on Hyd. Cylinder Speed Control Circuit
Notes on Handling
Maintenance/Inspection
Warranty

Our Products
QMCS
QDCS
KWCS
FA and Industrial Robot Related Products

Company Profile
Company Profile
History
Sales Offices

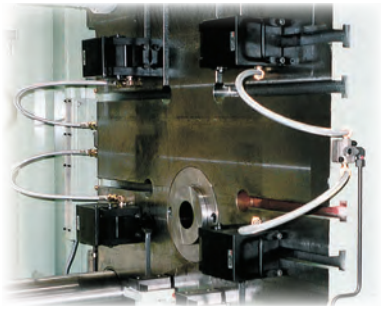
KOSMEK LTD. Head Office

Company Name	KOSMEK LTD.
Established	May 1986
Capital	¥99,000,000
Chairman & CEO	Tsutomu Shirakawa
President & CEO	Koji Kimura
Employee Count	270
Group Company	KOSMEK LTD.
	KOSMEK ENGINEERING LTD.
	KOSMEK (USA) LTD.
	KOSMEK EUROPE GmbH
	KOSMEK (CHINA) LTD.
	KOSMEK LTD. - INDIA
Business Fields	Design, Production and Sales of Precision Products, and Hydraulic and Pneumatic Equipment
Customers	Manufacturers of Automobiles, Industrial Machinery, Semiconductors and Electric Appliances
Banks	Resona Bank and Bank of Tokyo-Mitsubishi UFJ

Major Industrial Property Rights
(Including Patent Right and Patent Pending as of March 2022)

- Domestic ：120
- International ：250 (USA, EU, Taiwan, South Korea, China, India, Brazil, Mexico, Thailand, Indonesia)

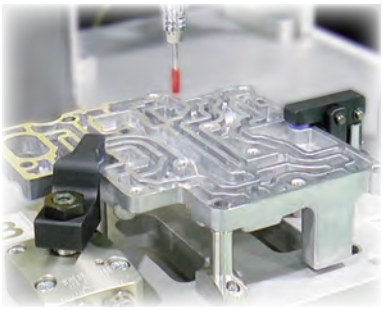
Product Line-Up



DIECAST CLAMPING SYSTEMS

For Diecast Machines

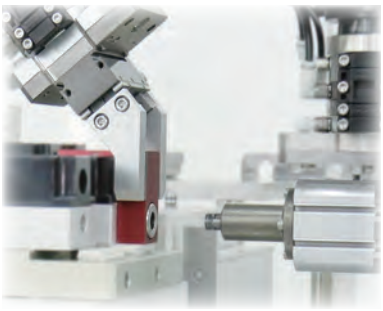
Kosmek Diecast Clamping Systems (KDCS) save the time of the changeover of die casting and magnesium molding machines under severe conditions. ex) mold release agents and high temperature.



KOSMEK WORK CLAMPING SYSTEMS

Machine Tool Related Products

Our clamping system enables boltless automation to load and unload workpieces easier.
Non-leak valve enables the use of hydraulic source and fixtures in a disconnected condition after locking (clamping action).
We offer a wide range of products such as hydraulic/pneumatic actuators, supports, positioning equipment, valves, couplers, etc.



KOSMEK FACTORY AUTOMATION SYSTEMS

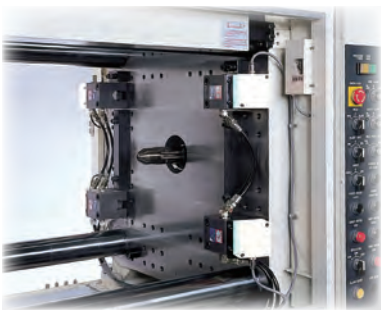
FA・Industrial Robot Related Products

KOSMEK robotic hand changer, robotic hand, positioning equipment and other products improve automation, precision and setup of transfer, assembly, deburring, testing and various other processes.

QUICK DIE CHANGE SYSTEMS

For Press Machines

Kosmek Quick Die Change Systems are a cost effective tool to improve the working environment, allow diversified and small-lot production, and reduce press down time.
Available for a wide range of machines; from large size transfer-presses to smaller high speed presses.



QUICK MOLD CHANGE SYSTEMS

For Injection Molding Machines

Automatic clamping systems have reduced mold change times and increased production efficiency for plastics manufacturers in a multitude of industries.
We offer a variety of different clamping options, including hydraulically powered clamps, pneumatic clamps with a force multiplying mechanism, and magnetic clamping systems.

Sales Offices

Sales Offices across the World

Japan	KOSMEK LTD. HEAD OFFICE	**TEL. +81-78-991-5162** FAX. +81-78-991-8787 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241
USA	KOSMEK (USA) LTD. Overseas Affiliate	**TEL. +1-630-620-7650** FAX. +1-630-620-9015 650 Springer Drive, Lombard, IL 60148 USA
	KOSMEK (USA) LTD. Atlanta Branch Office	**TEL. +1-708-577-3275** 303 Perimeter Center North, Suite 300, Atlanta, GA 30346 USA
Mexico	KOSMEK (USA) LTD. Mexico Branch Office	**TEL. +52-1-55-3044-9983** Av. Santa Fe 103, Int. 59, col. Santa Fe Juriquilla, Queretaro, QRO, 76230, Mexico
Europe	KOSMEK EUROPE GmbH Overseas Affiliate	**TEL. +43-463-287587** FAX. +43-463-287587-20 Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria
China	KOSMEK (CHINA) LTD. Overseas Affiliate	**TEL.+86-21-54253000** FAX.+86-21-54253709 Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China
	KOSMEK (CHINA) LTD. Dongguan Office Overseas Affiliate (Sales Office)	**TEL.+86-769-85300880** Room301, AcerBuilding No.15, Dezheng(W)Road, Changan Town Dongguan Guangdong 523843., P.R.China
	KOSMEK (CHINA) LTD. Wuhan Office Overseas Affiliate (Sales Office)	**TEL.+86-27-59822303** Room502, Building A, Jingkai Future City, Zhuankou Economic Development Zone, Wuhan City, Hubei Province, 430050 China
India	KOSMEK LTD. - INDIA Branch	**TEL. +91-9880561695** 4A/Old No:649, Ground Floor, 4th D cross, MM Layout, Kavalbyrasandra, RT Nagar, Bangalore -560032 India
Thailand	KOSMEK Thailand Representative Office Representative Office	**TEL. +66-2-300-5132** FAX. +66-2-300-5133 67 Soi 58, RAMA 9 Rd., Phatthanakan, Suanluang, Bangkok 10250, Thailand
Taiwan	FULL LIFE TRADING CO., LTD. Taiwan Exclusive Distributor	**TEL. +886-2-82261860** FAX. +886-2-82261890 16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511
Philippines	G.E.T. Inc, Phil. Philippines Exclusive Distributor	**TEL.+63-2-310-7286** FAX. +63-2-310-7286 Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427
Indonesia	PT. Yamata Machinery Indonesia Exclusive Distributor	**TEL. +62-21-29628607** FAX. +62-21-29628608 Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia

Sales Offices in Japan

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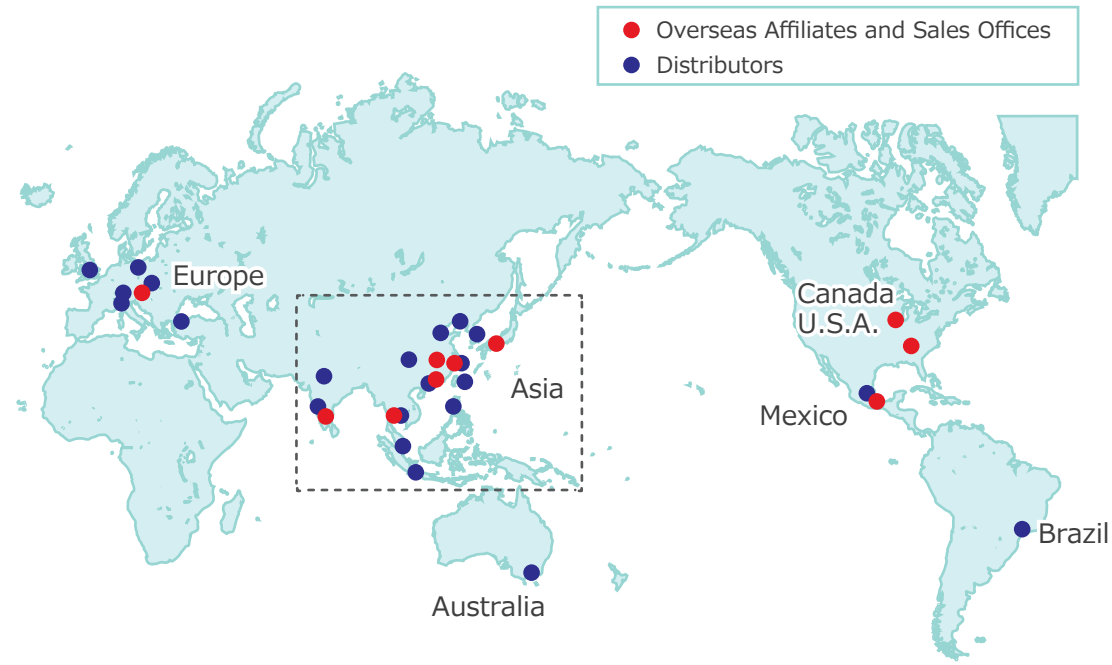
Tokyo Sales Office	**TEL. 048-652-8839** FAX. 048-652-8828 81, 4-chome, Onari-cho, Kita-ku, Saitama City, Saitama, 331-0815, Japan
Nagoya Sales Office	**TEL. 0566-74-8778** FAX. 0566-74-8808 10-1, 2-chome, Misono-cho, Anjo City, Aichi, 446-0076, Japan
Fukuoka Sales Office	**TEL. 092-433-0424** FAX. 092-433-0426 8-10-101, 1-chome, Kamimuta, Hakata-ku, Fukuoka City, Fukuoka, 812-0006, Japan

Global Network



Asia Detailed Map

KOSMEK
Harmony in Innovation

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