

KOSMEK Work Clamping Systems

Work Efficiency Improvement

Installation Guide



Factory Automation

The Changes in Machining Lines

1. Shifting to General-Purpose Machines

Machining demands are shifting from mass production to built-to-order production, which is to produce only a required number of products when necessary. This means specific-purpose machine lines with high-depreciation charge need to be changed to cost-reduced machining lines composed of general-purpose machines. The key to solve this task is machining fixtures.

We offer a wide range of products that compose the machining fixtures.



Swing Clamp



Link Clamp



Work Support



Centering Vise

3. Development of Machining Fixtures

While a general-purpose machine line improves the ways of machining, its manufacturing ability is limited.

To improve the work efficiency, it is required to machine multiple workpieces simultaneously and improve machining conditions by replacing cutting tools.

We offer new work clamping ideas to make fixtures more efficient.



High-Power Clamp



Hole Clamp

2. Efficient Use of General-Purpose Machines

An advantage of using general-purpose machines:

It is easy to modify a machine into a general-purpose machine for various workpieces. One general-purpose machine line applies to machine multiple kinds of workpieces. However, setup is always required and reducing that time is a huge challenge.

We offer products that allow anyone to change fixtures at once.



Pallet Clamp



Screw Locator



Quick Change Lever

4. Machining Line Automation

The number of automated machining lines is rapidly growing in order to reduce high labor cost and stabilize product quality. However, it is hard to stabilize automation since a reference position is shifted every time a fixture is changed.

We offer suitable work clamps and high accuracy setup system for stable automation.



Air Sensing Clamp



Expansion Locating Pin



Robotic Hand Changer



Robotic Hand

1. Shifting to General-Purpose Machines

Swing Clamp

Standard Clamp Cylinder with 90° Lever Swing
Excellent in clamping force, draining cutting chips
and loading/unloading workpieces!



Work Support

Best-Selling product for preventing workpiece chattering.
Installed under a workpiece, it enables more stable machining.



The Key Products for Machining Fixtures of General-Purpose Machines

Link Clamp

Link-type Standard Clamp Cylinder

The simple model of a linear cylinder equipped with link mechanism.



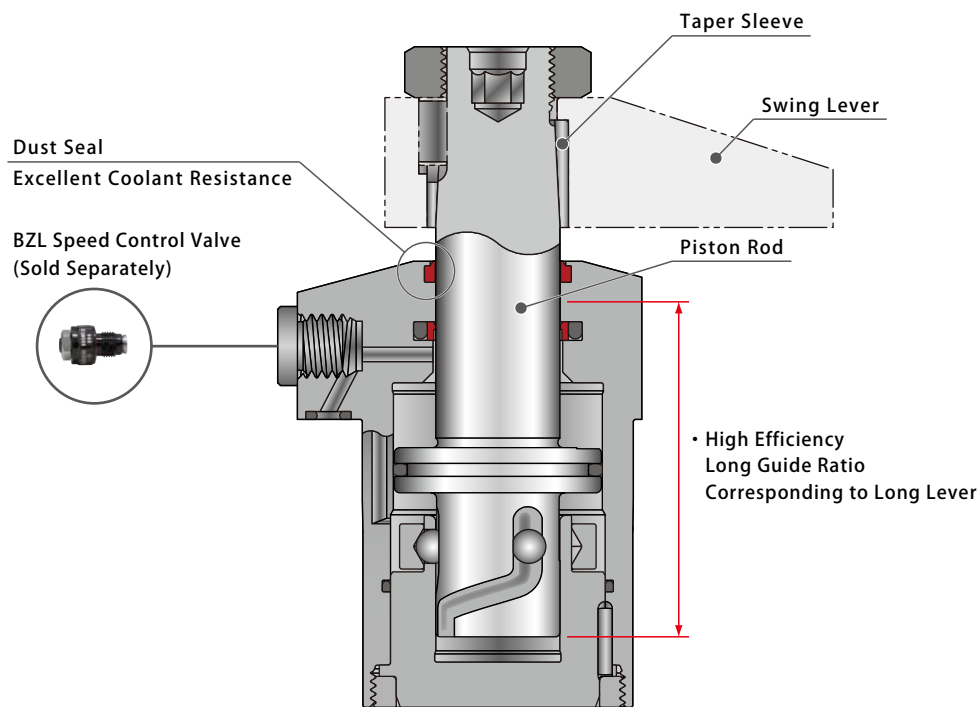
Centering Vise

The Hydraulic Vise to grip and locate a cylindrical workpiece. We offer Kosmek-exclusive compact/high accuracy model and long stroke model, etc.



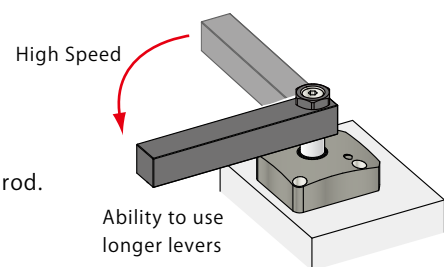
Swing Clamp

PAT.



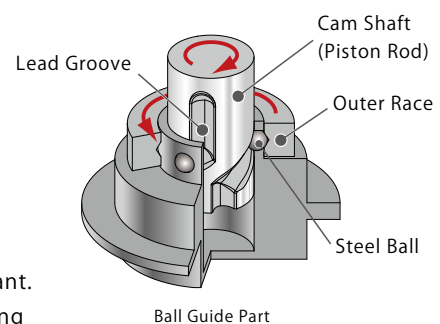
Able to Use Longer Levers

The long guide ratio allows for longer clamping levers by supporting the rod. The guide is located between the flange and at the edge of the rod.



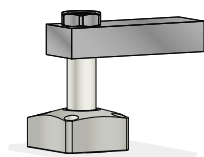
High Speed and High Durability with Rotation Mechanism

The resistance created by the swing action is minimized by having the outer race rotate in accordance with the steel ball movement. High endurance is achieved by enlarging rod diameter which decreases torque and by using bigger steel balls and making the lead groove. (Swing Complete Position Repeatability : within $\pm 0.5^\circ$)

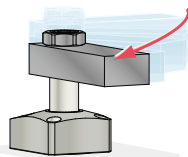


Excellent Coolant Resistance

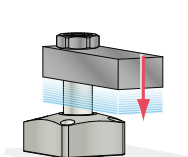
Our exclusive dust seal is designed to protect against high pressure coolant. It also has high durability against chlorine-based coolant by using a sealing material with excellent chemical resistance.



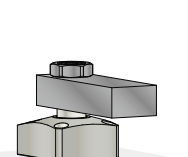
Before Swing
(Released State)



The lever descends as it swings.
(For LHS, the lever swings parallel.)

















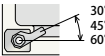
After swing completion,
it descends vertically.



Action completed
(Clamped State)









Low Pressure Model

MAX. 7MPa

Low Pressure Model MAX. 7MPa			Air Sensing Model						
									
Classification			Double Action Standard	Double Action Compact	Double Action Parallel Swing	Double Action Built-in Sensing Valve	Double Action Built-in Sensing Valve	Single Action (Spring Release)	
Operating Pressure Range			1.5 ~ 7MPa	1.5 ~ 7MPa	1.5 ~ 7MPa	1.5 ~ 7MPa	1.5(2.0) ~ 7MPa	2.5 ~ 7MPa	
Standard Model			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Action Confirmation	Double End Rod Option for Dog		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Air Sensing Manifold Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Air Sensing Piping Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Built-in Sensing Valve Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Option	Quick Change Lever Option A		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Quick Change Lever Option F		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Balance Lever Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Long Stroke Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Swing Angle Selectable Option		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

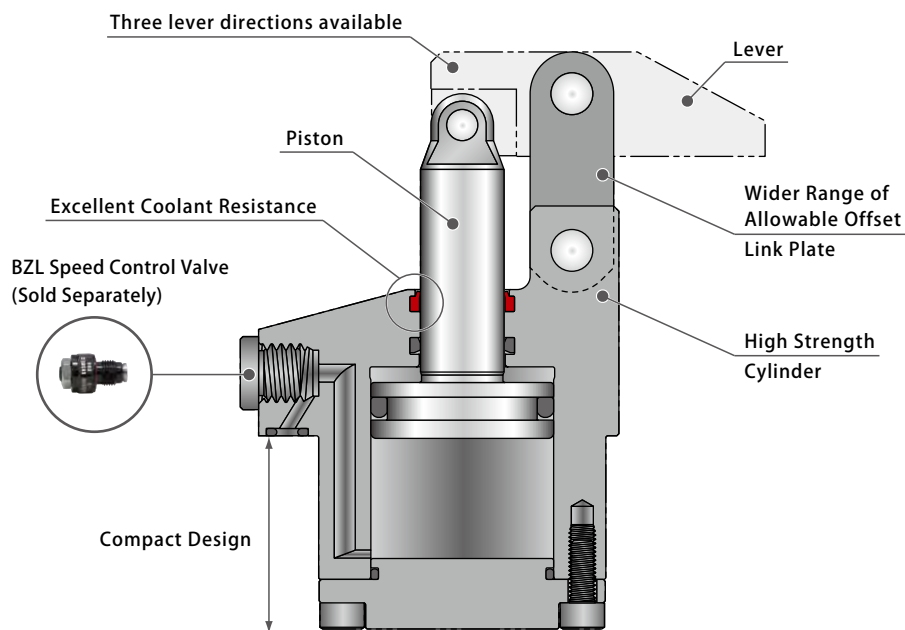
High Pressure Model

MAX. 35MPa

		Air Sensing Model			
					
		Model TLA-2	Model TLB-2	Model TLA-1	Model TLV-2
Classification		Double Action Top Flange	Double Action Bottom Flange	Single Action (Spring Release) Top Flange	Double Action Top Flange Built-in Sensing Valve
Operating Pressure Range		7 ~ 35MPa	7 ~ 35MPa	7 ~ 35MPa	7 ~ 35MPa
Standard Model		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Option	Built-in Sensing Valve Option 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Balance Lever Option 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Long Stroke Option 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Swing Angle Selectable Option 	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Link Clamp

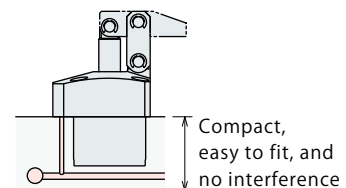
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Compact

The dimension below flange is shortened by 40 percent to enable thinner and lighter fixtures.

The compact body allows the internal fitting without interference and makes fixture design more engineer friendly.



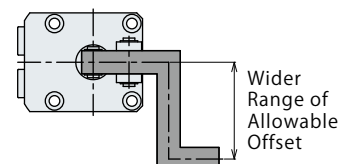
High Strength Supporting Point

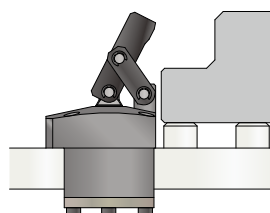
The compact body is able to retain similar clamping and holding forces by including a high strength supporting point within the body cylinder. Its strength is the best in the industry, by way of casting.



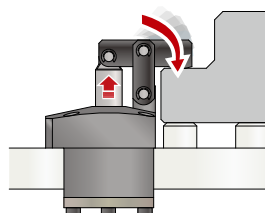
A Wider Range of Allowable Offset

High strength link plate option is available for larger tolerance.














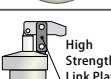








Released State



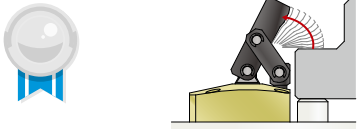
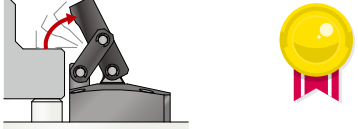
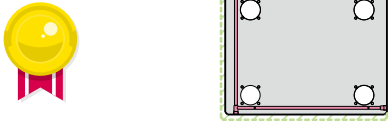
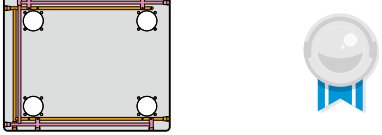
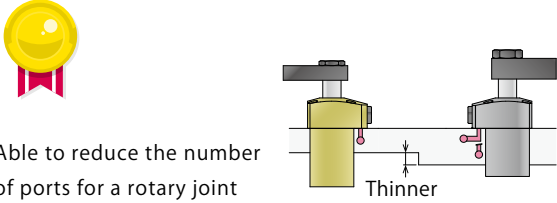



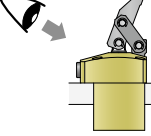
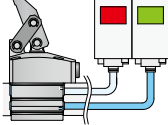


Locked State




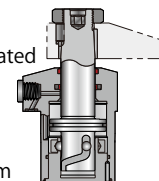
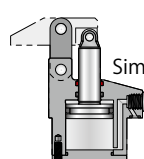






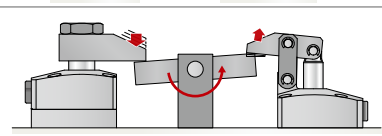


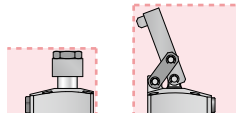


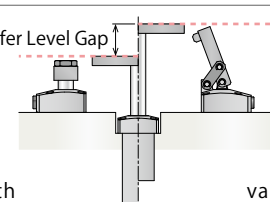


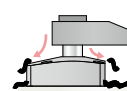
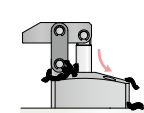


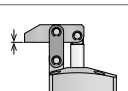
Air Sensing Model								
Low Pressure Model MAX. 7MPa								
	Model LKA	Model LKC	Model LKK	Model LFA	Model LKW	Model LFW	Model LKV	Model LM/LJ
Classification	Double Action Standard	Double Action Compact	Double Action 360° Clamp	Double Action Lever Retraction	Double Action Built-in Sensing Valve	Double Action Lever Retraction Built-in Sensing Valve	Double Action Built-in Sensing Valve	Single Action (Spring Release)
Op. Pressure Range	0.5 ~ 7MPa	0.5 ~ 7MPa	0.5 ~ 7MPa	1.0 ~ 7MPa	0.5 ~ 7MPa	1.0 ~ 7MPa	1.0 ~ 7MPa	2.5 ~ 7MPa
Standard Model	○	○	○	○	—	—	—	○
Action Confirmation	Double End Rod Option for Dog 	○	—	—	○	—	—	—
	Air Sensing Manifold Option 	○	—	—	—	—	—	—
	Air Sensing Piping Option 	○	—	—	—	—	—	—
	Built-in Sensing Valve Option 	—	—	—	○	○	○	—
Option	Quick Change Lever Option A 	○	○	○	—	○	—	○
	High Strength Link Plate Option 	○	○	—	—	○	—	○
	Flange Pin with C-type Circlip 	○	○	○	—	○	—	○

High Pressure Model MAX. 35MPa		Air Sensing Model		
				
		Model TMA-2	Model TMA-1	Model TMV-2
Classification		Double Action	Single Action (Spring Release)	Double Action Built-in Sensing Valve
Op. Pressure Range		3.5 ~ 35MPa	3.5 ~ 35MPa	3.5 ~ 35MPa
Standard Model		○	○	—
Built-in Sensing Valve Option		—	—	○

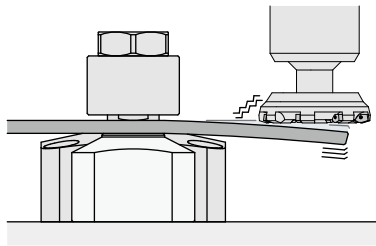
Features of Single Action and Double Action

	 Single Action Hyd. Lock • Spring Release	 Double Action Hyd. Lock • Hyd. Release
Operating Speed	 Unable to control releasing speed	 Easy to control speed with the double-acting circuit
Fixture Cost	 Reduce fixture costs because hydraulic pipe is needed only for lock side	 The fixture is complicated because both lock and release sides need hydraulic pipes
Number of Ports	 Able to reduce the number of ports for a rotary joint Thinner	 Twice the number of ports of single acting model is required
Cylinder Mass	 Lighter cylinder body made of aluminum alloy Lighter	 Steel made
Action Confirmation	Visual Inspection  Lock and release actions need to be checked by an operator	Sensor  Lock and release actions can be checked by air sensors (option)
Applicable Equipment	Manual Transfer Line General-purpose equipment that requires frequent fixture changeover	Automated Transfer Line

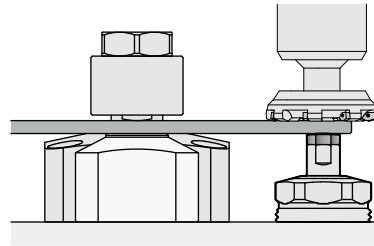
Features of Swing Clamp and Link Clamp

	 Swing Clamp		 Link Clamp	
Cost	 <p>Complicated structure: internal swing mechanism</p>	 <p>Complicated</p>	 <p>Simple</p>	 <p>Simple structure: linear cylinder with link mechanism</p>
Action Interference	<p>Horizontal</p> 		<p>Horizontal</p> 	<p>Vertical</p> 
Clamping Force	 <p>Efficient : Cylinder force is directly applied</p>			 <p>Not so efficient: Cylinder force is applied via link mechanism</p>
Workpiece Loading	 <p>Not affected by lever length when loading/unloading</p>			 <p>May be interfered depending on lever length when loading/unloading</p>
Transfer Level	 <p>The height at released state is not affected by lever length</p>	 <p>Transfer Level Gap</p>		 <p>The height at released state varies depending on lever length</p>
Cutting Chips Draining	 <p>No bumps on the flange top Cutting chips will be drained</p>			 <p>Cutting chips may be stuck in the link mechanism part</p>
Workpiece Variation	<p>Available</p> <p>Usable at any position within vertical stroke ※ Only within lock stroke for high-power series.</p>			<p>Not Available</p> <p>Usable only with a lever in parallel state</p>

Work Support

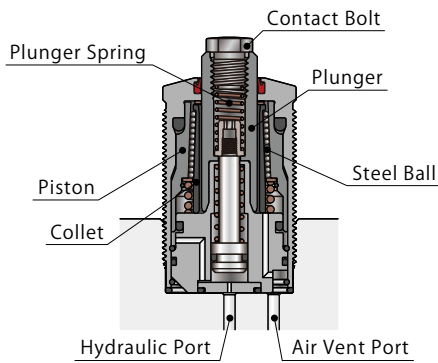


Without Work Support
Chattering!

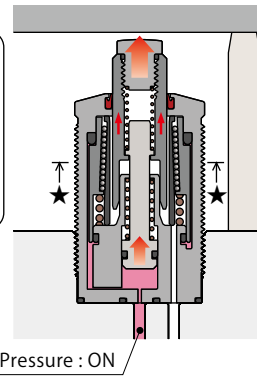
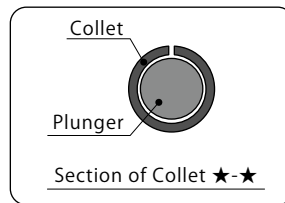


With Work Support
No Chattering!

Hydraulic Advance Model

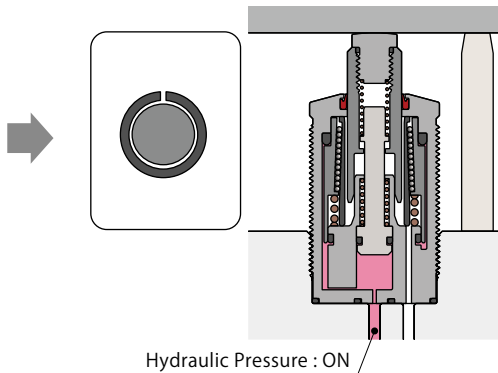


Released State (Cross Section)



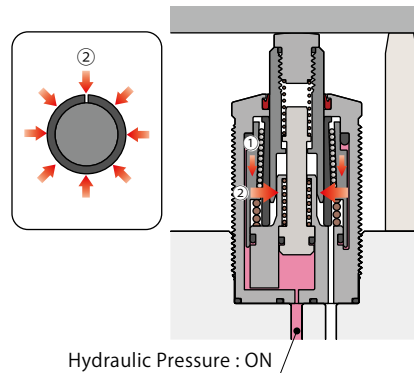
Hydraulic Pressure : ON

Plunger Advancing



Hydraulic Pressure : ON

Contact bolt touches the workpiece

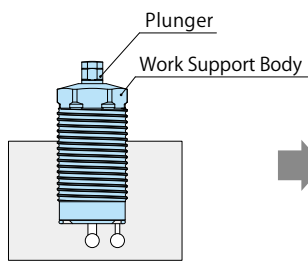


Hydraulic Pressure : ON

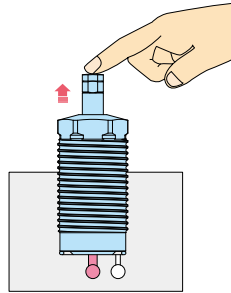
Locked State

- ① The piston starts to press down via hydraulic pressure.
- ② The tapering action between the piston and collet affects the steel ball so that the collet can grip the plunger with even and strong power to generate the supporting force.

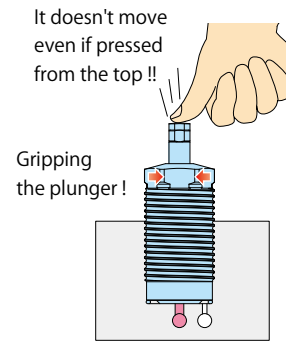
Hydraulic Advance Model















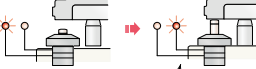


Hydraulic Pressure : OFF
The state of the plunger down.



Hydraulic Pressure : ON
The plunger advances with hydraulic pressure and stops after touching a workpiece.



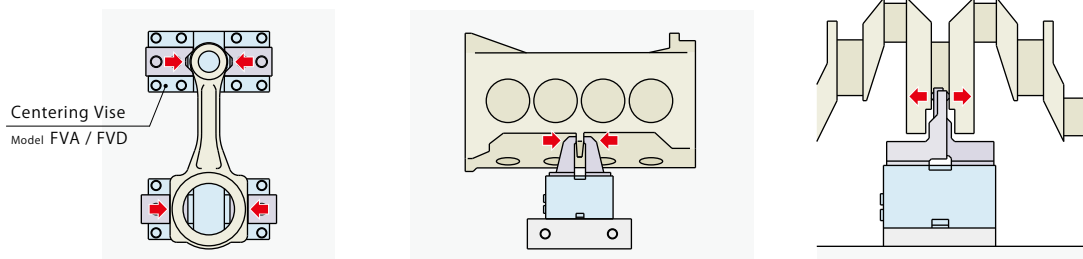
Hydraulic Pressure : ON
Once it is in the stopped position where it touches the workpiece, the plunger doesn't go down even if pressed from above.

	 Model LD	 Model LDD	 Model LC	 Model LCW	 Model TND	 Model TNC	 Model TC
Classification	Low Pressure Single Action External Thread	Low Pressure Double Action External Thread	Low Pressure Single Action Top Flange	Low Pressure Single Action Built-in Sensing Valve	High Pressure Double Action External Thread	High Pressure Single Action External Thread	High Pressure Single Action Top Flange
Operating Pressure Range	2.5 ~ 7MPa	2.5 ~ 7MPa	2.5 ~ 7MPa	2.5 ~ 7MPa	7 ~ 35MPa	7 ~ 35MPa	7 ~ 25MPa
Standard : Hydraulic Advance		○	○	○	○	○	○
Hydraulic Advance Short Model		○	—	—	—	—	—
Hydraulic Advance Long Stroke Model		○	○	○	—	○	○
Spring Advance Model Spring Advance Short Model		○	—	○	—	○	○
Spring Advance Long Stroke Model		○	—	○	—	○	○
Built-in Sensing Valve Model		—	—	—	○	—	—
Air Sensing Option		○	○	○	—	○	—
Rodless Hollow Model		—	—	○	—	—	○

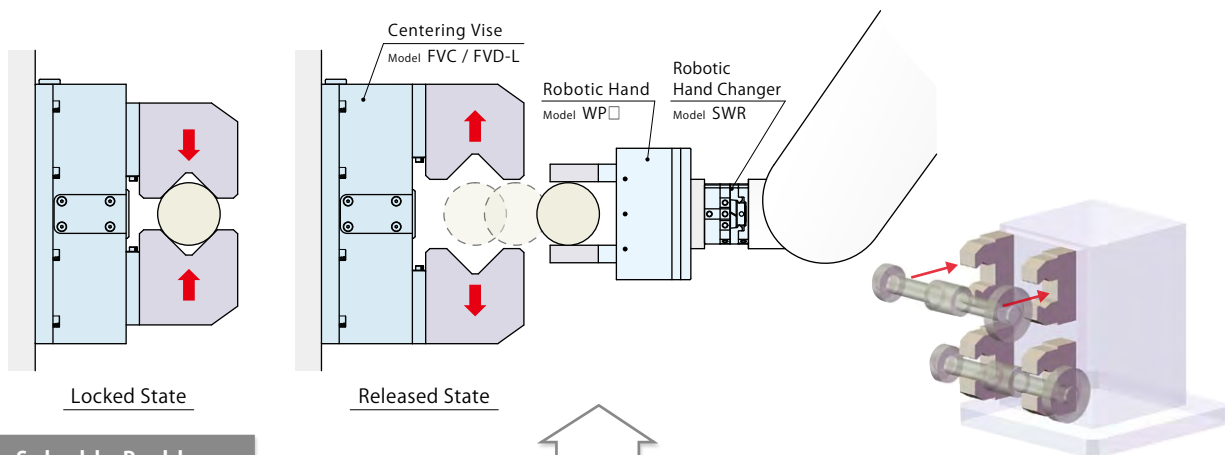
Centering Vise

Compact + High-Accuracy Model and Long Stroke Model for Automation

High Accuracy Model for Locating a Workpiece



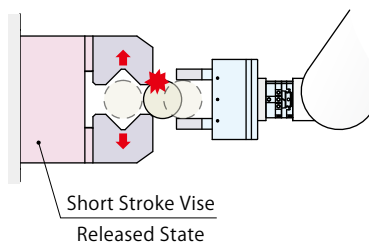
Long Stroke Model for Automatic Transfer with a Robot



Solvable Problems

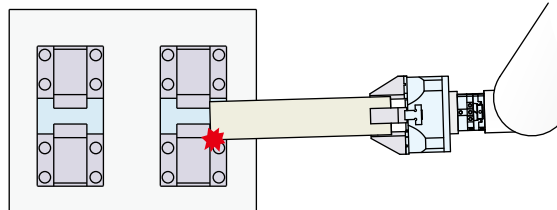
When Loading from the Front

A short-stroke vise is unable to secure enough clearance for loading a workpiece.

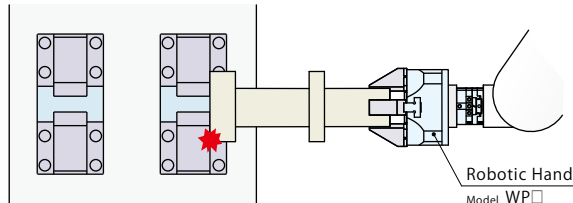


When Loading from the Side

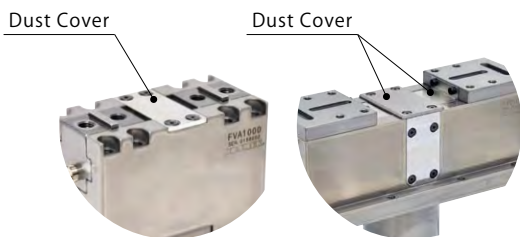
A robot cannot keep a long workpiece horizontal.



It is unable to secure enough clearance for loading an irregular-shape workpiece.



Equipped with Dust Cover



Easy to Machine the Mounting Surface of the Clamp Lever

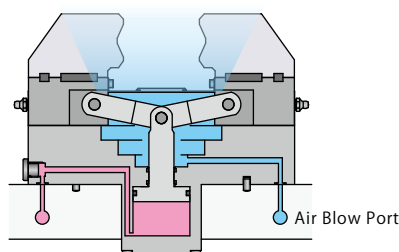
Only key slot and bolt hole need to be machined for mounting the clamp lever.
 Complicated serration machining is not required.

Secure Locking of Workpiece with Powerful Gripping Force

Air Blow Function

FVA/FVC Only

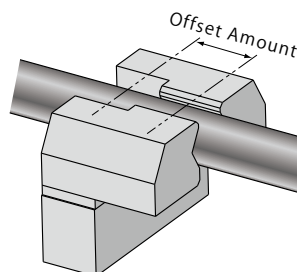
The dust cover and air blow prevent contaminants and enable a longer operational life span.



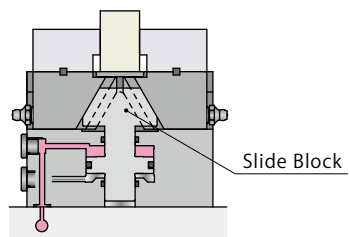
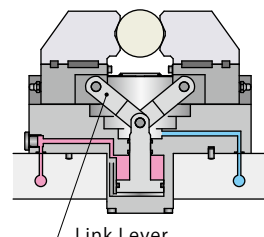


Offset Available

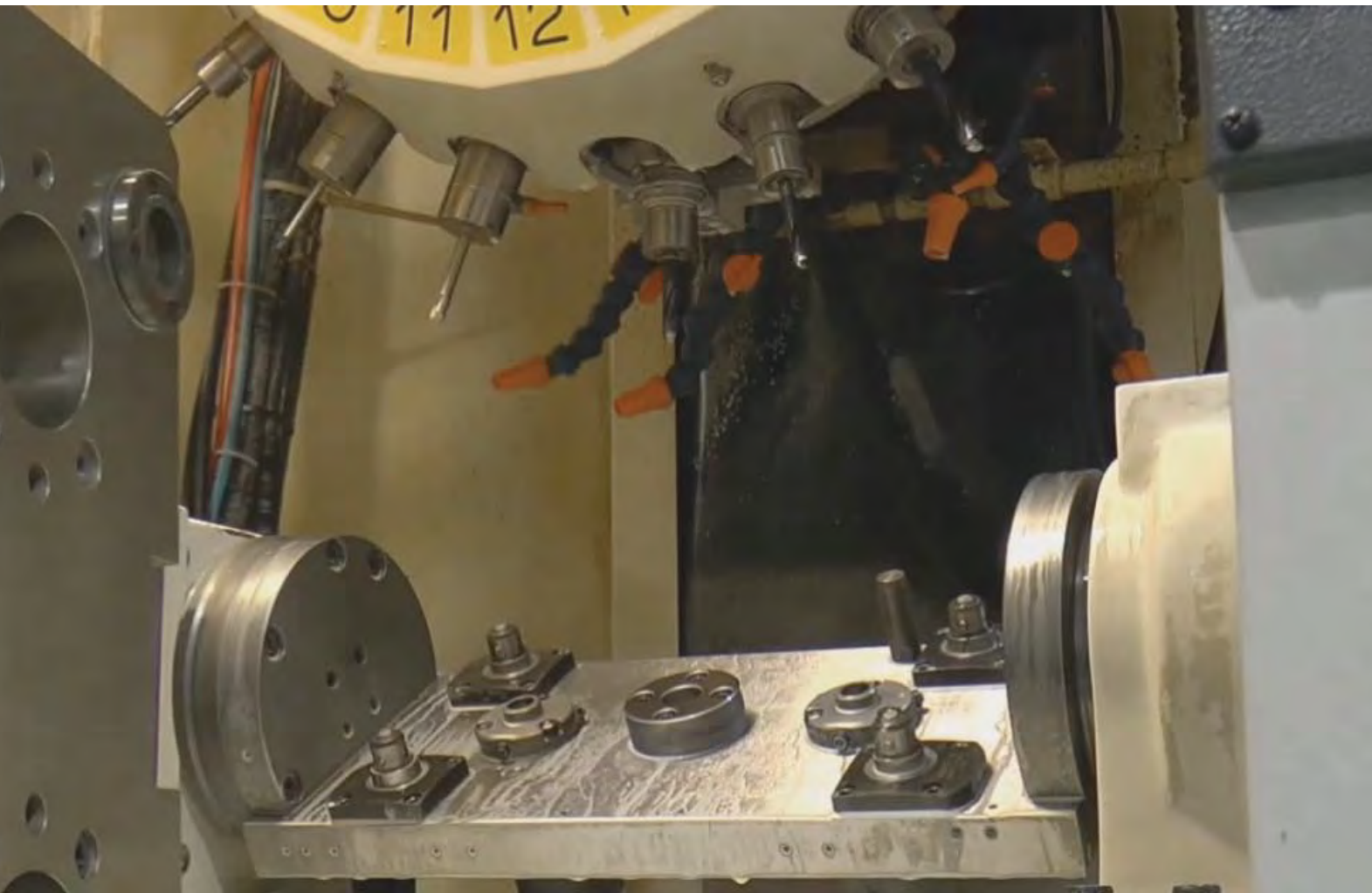
FVC Only

Offset of a workpiece is available.
 Drill tools are more accessible to the workpiece.
 Easier to avoid interference with a loader, etc.
 ※ Please contact us when using it with offset.



Double Action MAX. 7 MPa				
	Model FVA	Model FVD	Model FVD-L	Model FVC
Classification	Slide Block Model			Link Motion Model
	Compact	High Power	Long Stroke	Long Stroke
Cross Section				
Features	High Accuracy	High Accuracy and High Power	High Accuracy and Long Stroke	Long Stroke of Link Motion Model
Locating Repeatability (X-axis Direction)	±0.01 mm			±0.03 mm
Slider Stroke (One Side)	FVA0401 : 5 mm FVA0631 : 5 mm FVA1001 : 5 mm	FVD1600 : 6 mm FVD2500 : 8 mm FVD4000 : 8 mm	FVD1600-L : 12 mm FVD2500-L : 16 mm FVD4000-L : 16 mm	FVC0630 : 10 mm FVC1000 : 15 mm FVC1600 : 20 mm

2. Efficient Use of General-Purpose Machines






Pallet Clamp

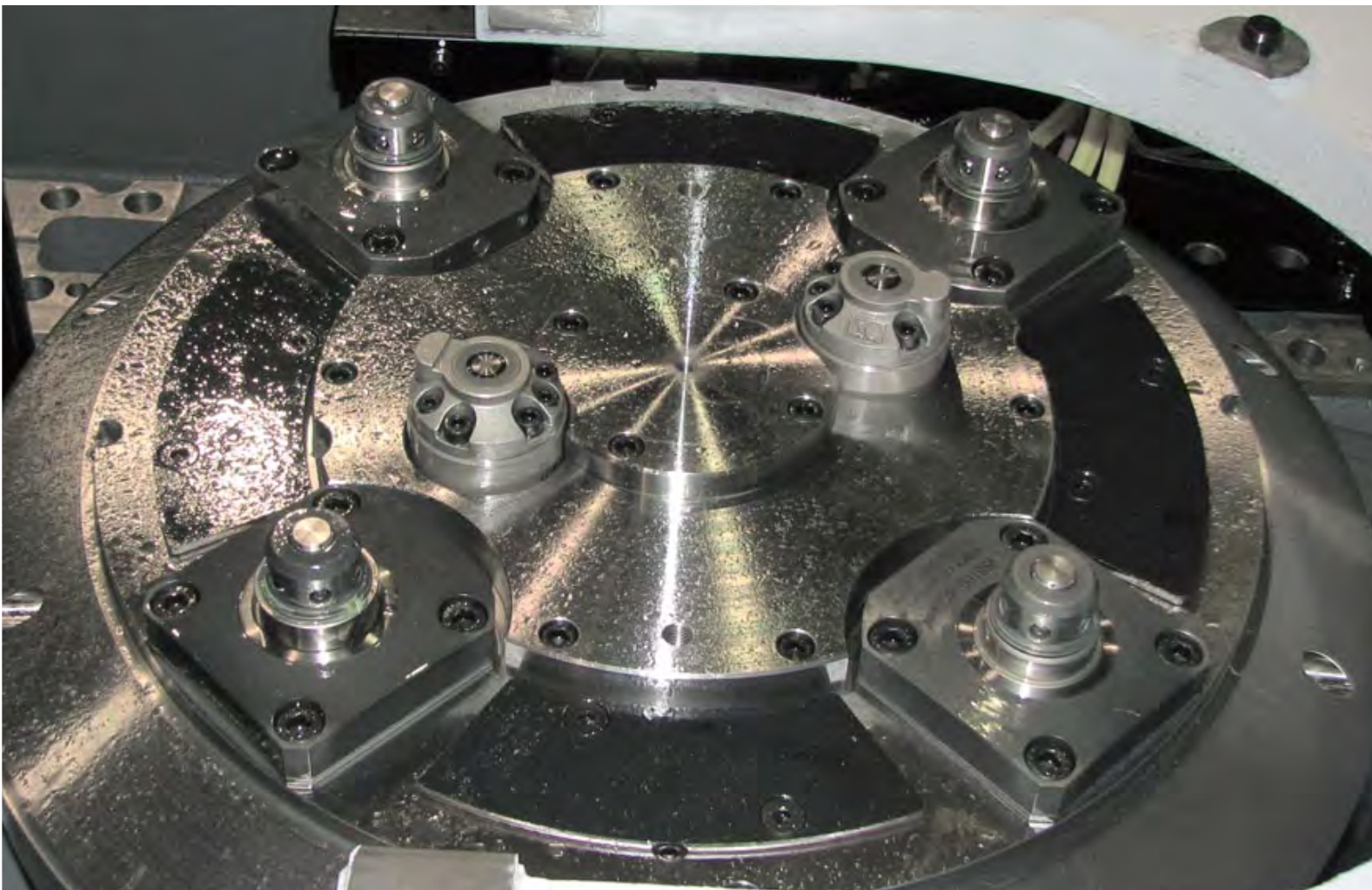
No Skills Required!
The Fastest Fixture Setup



Simultaneous clamping + locating with $3\text{ }\mu\text{m}$ locating repeatability is possible!
Fixture setup skills are no longer required.

	 Model VS	 Model VT	 Model WVS
Classification	Single Action Spring Lock / Hyd. Release	Double Action Hyd. Lock / Hyd. Release	Double Action Air Lock / Air Release
Operating Pressure Range	3.5 ~ 7 MPa	1.5 ~ 7 MPa	0.25 ~ 0.5 MPa
Clamping Force	2.5 ~ 40 kN	4 ~ 16 MPa	4 ~ 15.7 MPa

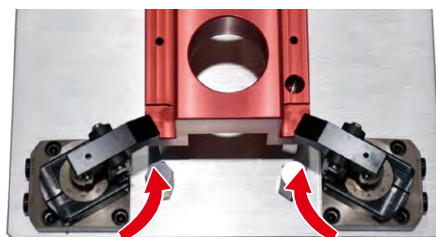
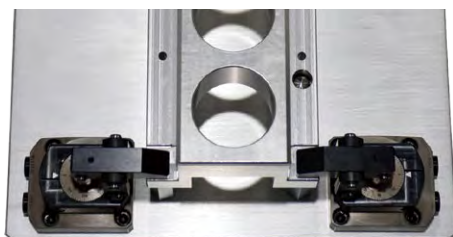
The Products for Efficient Fixture Setup of General-Purpose Machines



Universal Clamp

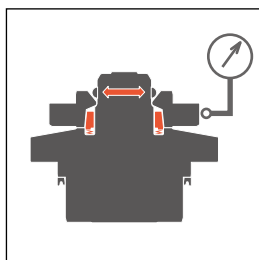
360° Rotatable Lever
Enables to Clamp Various Workpieces

Clamp Cylinder with the Rotatable Clamp Lever at 360 Degrees

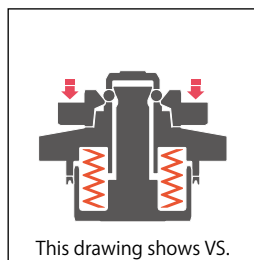


Model LKK

Pallet Clamp PAT.



Locating
Repeatability
3 μ m

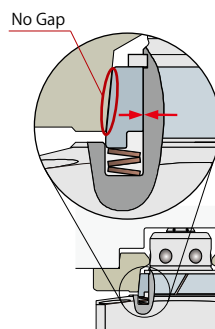


Clamping Force
2.5 ~ 40 kN

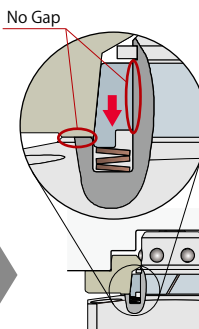
KOSMEK Exclusive Non-Backlash Mechanism

Dual Contact Enables High Rigidity + High Accuracy

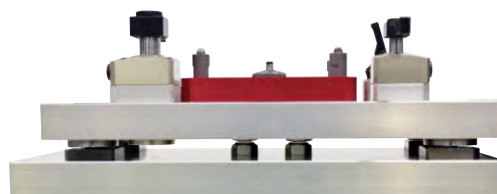
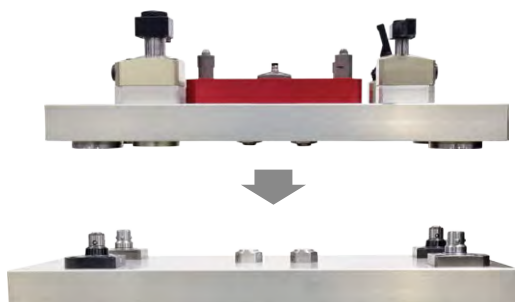
KOSMEK Pallet Clamp enables anyone, even robots, to switch fixtures at once. KOSMEK exclusive locating function allows for high accuracy locating with 3 μ m repeatability and clamping simultaneously.



Starting Position of Locating



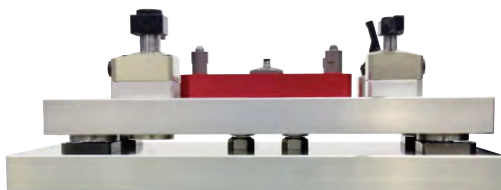
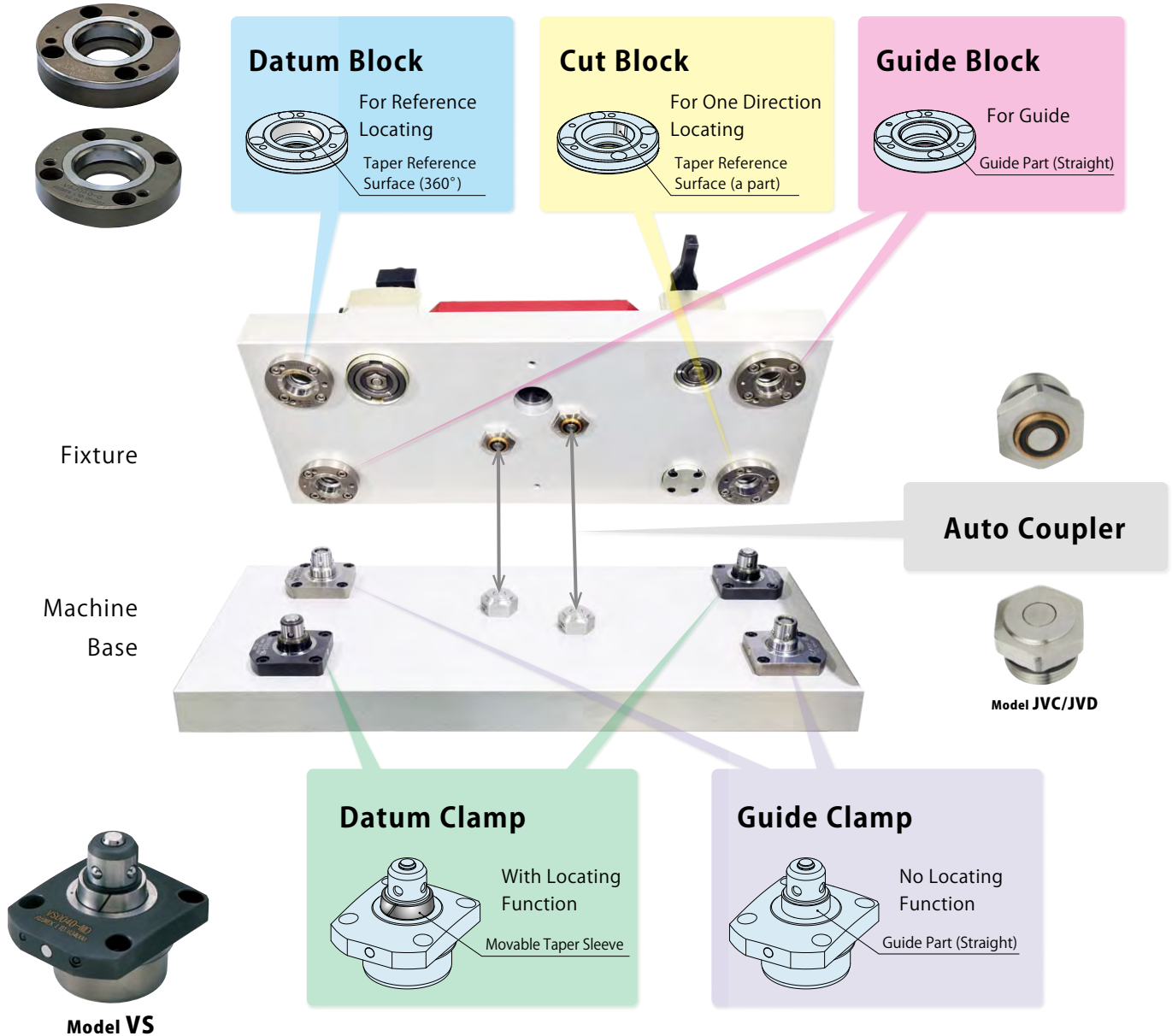
XYZ Locating Completed



① Loading the fixture ~ ② Loading completed

Release

KOSMEK Pallet Clamping Systems

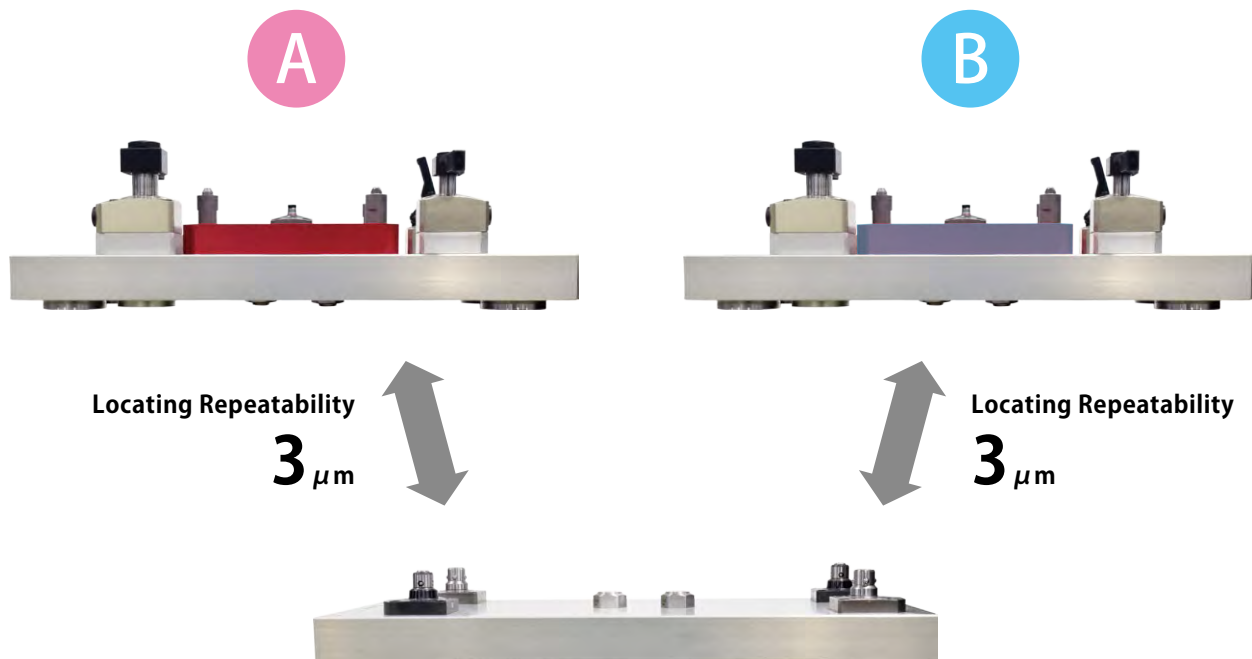


③ Locating + clamping of the fixture completed

Lock

- ① High accuracy is not required when loading a fixture. Anyone can load a fixture without technique.
- ② When loading is completed, the lift-up function of the Pallet Clamp will secure a gap to protect the locating part.
- ③ Fixture locating and clamping will be completed just by locking the Pallet Clamp from outside the machine. Also, using with auto couplers enables to supply hydraulic or air pressure to the fixture side.

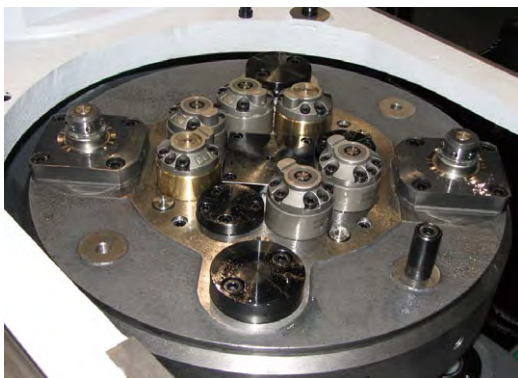
Pallet Clamp PAT.



KOSMEK Pallet Clamp has $3 \mu\text{m}$ Locating Repeatability

Kosmek Pallet Clamp enables a fixture to be located within $3 \mu\text{m}$ accuracy as the last time the fixture was located. Machining a workpiece can be started as soon as its program is activated, resulting in drastic setup time reduction.

The Case Study of the Pallet Clamps: Used in the Machine Table (Tapered Cone) of the Machine Tool

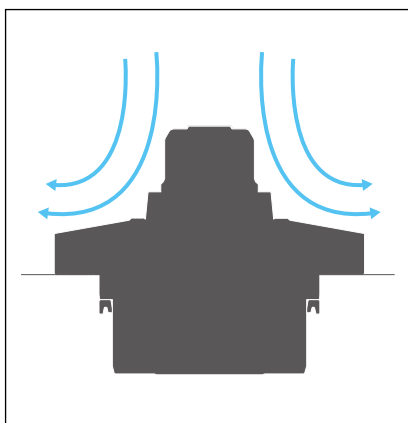


Set-up Side



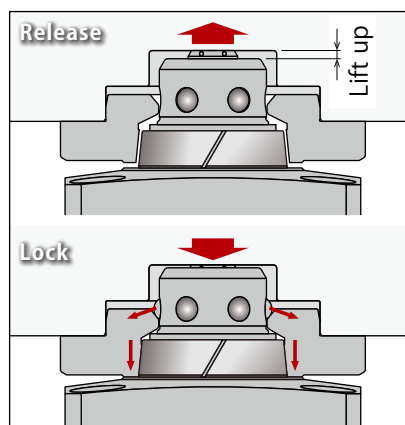
Inside the Machine

- Non-Leak Coupler (model: BGC/BGD) maintains hydraulic pressure after detached (Pallet Change: between set-up side and inside the machine). Additional hydraulic circuit is not required.
- The Pallet Clamps on the set-up side reduce setup time of fixture change, secure safety and connect the non-leak couplers.



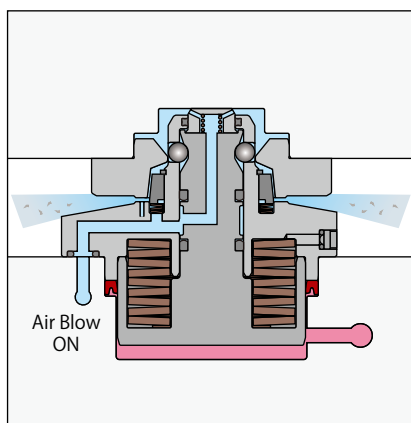
Easy-to-Clean Body Shape

The body shape allows for removing contaminants easily.



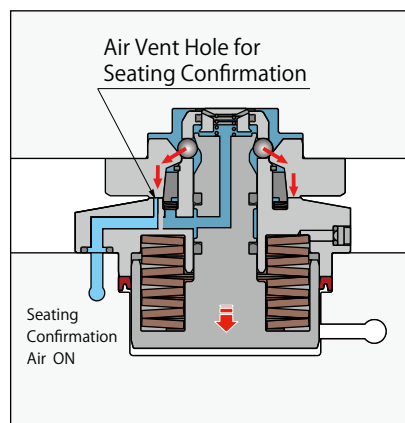
Lift-up Function

When setting a fixture, there is a gap between the tapered reference surface and seating surface to protect the locating part.



Air Blow Function

The air blow from inside the clamp removes cutting chips and coolant effectively.



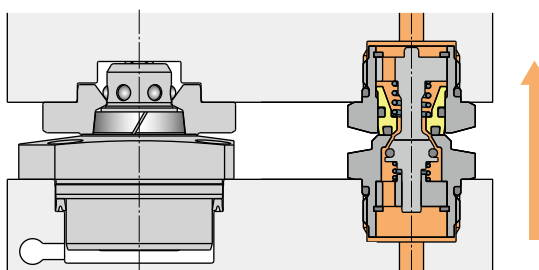
Seat Check Function

The air vent hole for seating confirmation detects contaminants.

Using with the Auto Coupler enables to supply hydraulic/ air pressure to a fixture by auto connection.



Auto Coupler

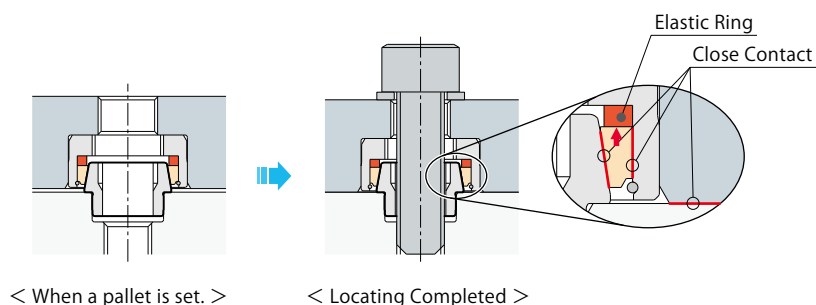
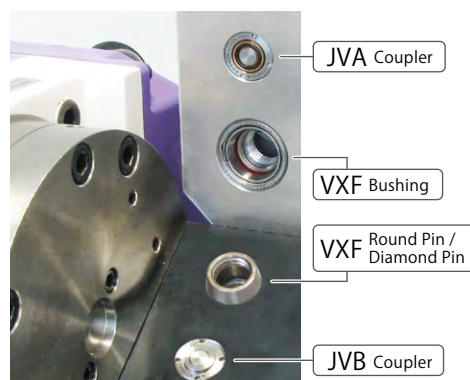


Screw Locator

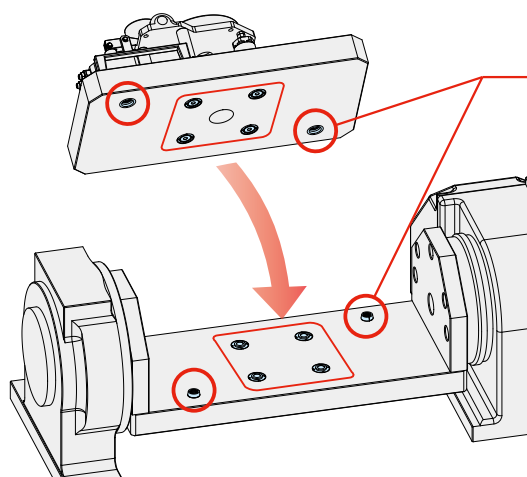
Screw Locator

Just by tightening with a bolt
Locating Repeatability **3 μm**

The same locating function as Pallet Clamp enables
high accurate locating just by tightening a fixture with a bolt.



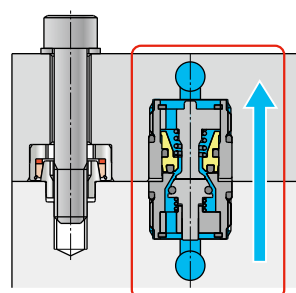
Model VXF



For Locating/Setup of Fixtures for
Machining Applications

Auto Coupler

Using with the Auto Coupler enables to supply hydraulic
or air pressure from the base plate to the pallet.



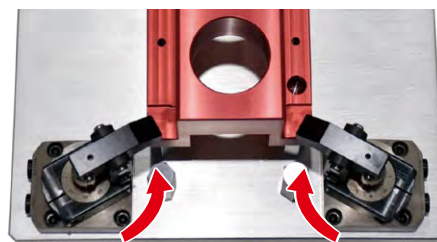
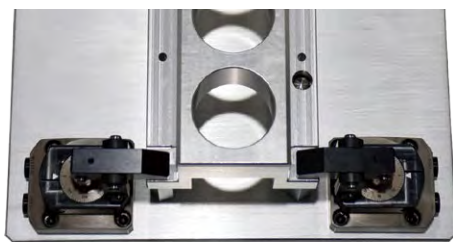
Model JVA/JVB

PAT. P.

Universal Clamp

360° Rotatable Lever Enables to Clamp Various Workpieces

Ex.) Turn the Lever by 30° to clamp two different workpieces.

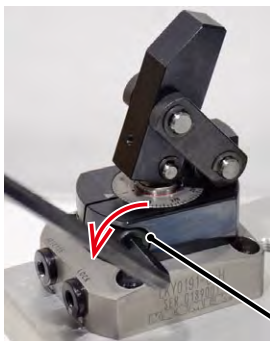


Model LKK

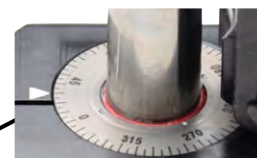
Just One Wrench to Position the 360° Rotatable Lever in Any Direction!

Lever Direction Changing Procedure

- ① Loosen the Lock Bolt at released state.
- ② Turn the Pivot Block. (Angle Scale in 5° increments.)
- ③ Tighten the Lock Bolt.



Lock Bolt

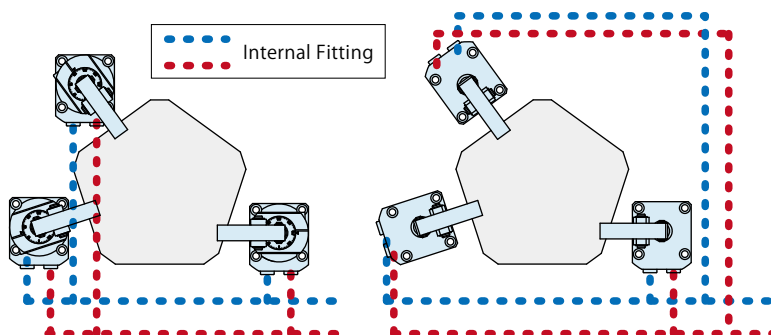


Angle Scale



Simpler Internal Fitting Design Possible!

Since the lever direction is 360° rotatable, internal fitting design can be so simple and there is no need to consider cylinder directions.

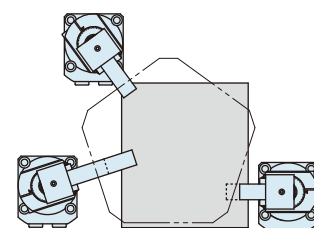


Universal Clamp

General Link Clamp

Quick Lever Change Possible!

Simpler and quicker lever changing is possible by using Quick Change Lever (option A).







3. Development of Machining Fixtures

**For Multi-Workpiece Layout,
Space Saving, Tool Improvement,**

Hole Clamp

Hole Clamp avoids interference with a tool, achieving Process Integration, Compact Fixture and Multi-Workpiece Layout. Tool's projecting length can be shortened, and its fluctuation can be minimized. This improves the manufacturing quality and operational life of tools.



	 Model SFA	 Model SFC	 Model SWE	 Model SWA
Classification	Double Action Hyd. Lock / Hyd. Release	Double Action (Offset Model) Hyd. Lock / Hyd. Release	Double Action Air Lock / Air Release	Double Action Air Lock / Air Release
Operating Pressure Range	1.5 ~ 7(4) MPa	1.5 ~ 7(4) MPa	0.2 ~ 0.5 MPa	0.25 ~ 0.7(0.5) MPa

The Products for New Clamping Method to Improve Work Efficiency Even More

Machining Accuracy Improvement and Cycle Time Reduction





High-Power Clamp

Compact, yet exerts powerful clamping force.

Allows for compact fixture and multi-workpiece layout.

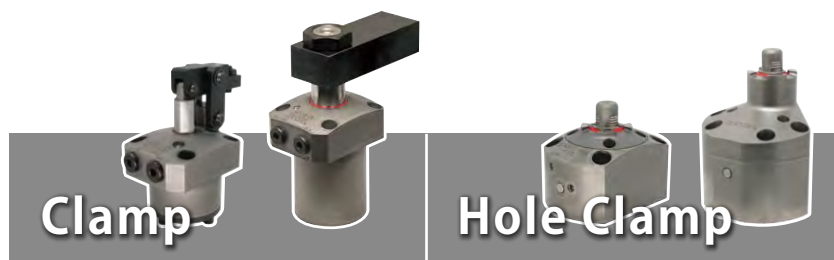
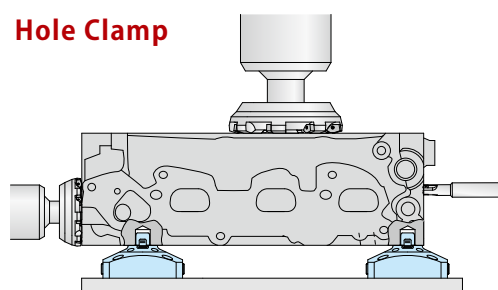
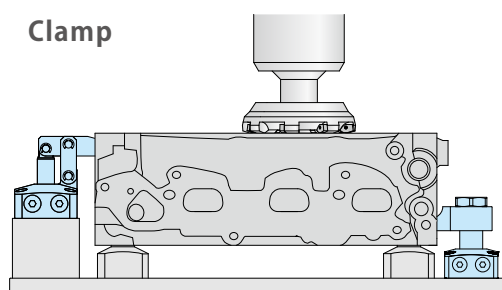
Powerful holding force to minimize workpiece fluctuation enables to improve the manufacturing quality and operational life of tools.

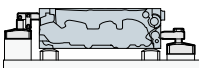
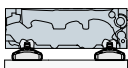


	 Model LHE	 Model LKE	 Model WHE	 Model WCE
Classification	Double-Acting Swing Clamp Hyd. Lock / Hyd. Release	Double-Acting Link Clamp Hyd. Lock / Hyd. Release	Double-Acting Swing Clamp Air Lock / Air Release	Double-Acting Link Clamp Air Lock / Air Release
Operating Pressure Range	1.5 ~ 6MPa	0.5 ~ 6MPa	0.2 ~ 0.5MPa	0.2 ~ 0.5MPa

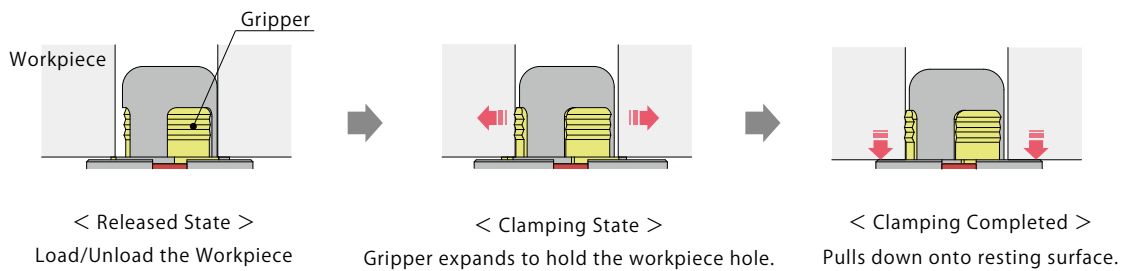
Hole Clamp

Hole Clamp for Integrated Operation, Space Saving and Multi-Workpiece Layout



Number of machinable faces without interference	3		5	
Fixture Weight ※1	About 40kg		About 30kg	
Table Size	Large		Compact	
Amount of Coolant (Cutting Chips Draining)	Large (△)		Small (○)	
Height of Transfer Equipment	High		Low	

※1. Reference fixture weight when clamping a workpiece (300mm × 200mm) with 4 clamps.

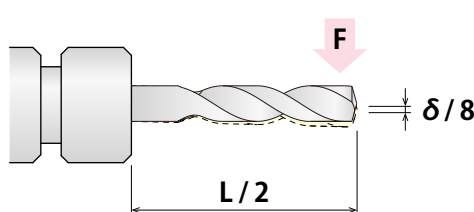
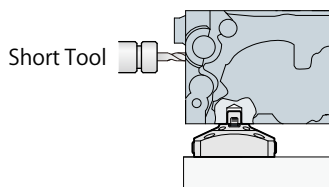
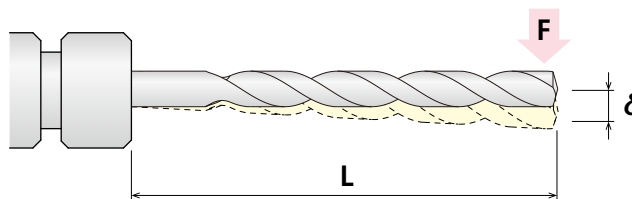
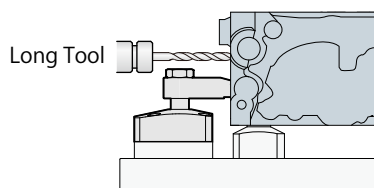


More Accessible Tools

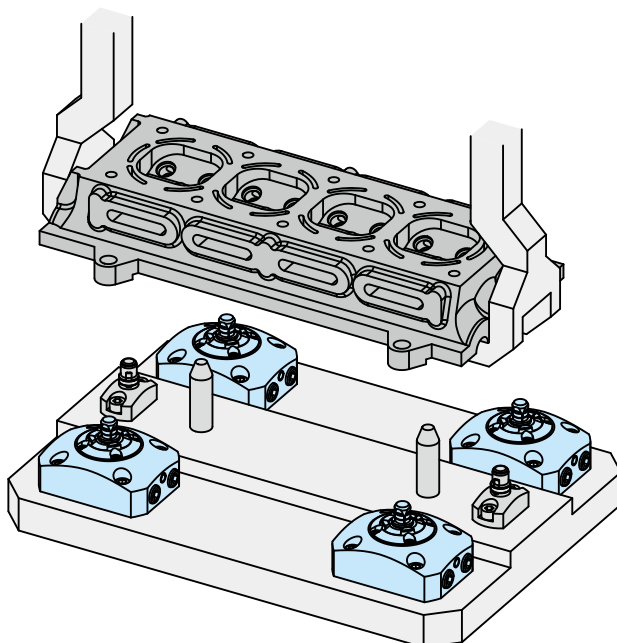
No interference of a cutting tool and a clamp means closer access of the cutting tool to a workpiece, and shorter projecting length. This enables the cutting tool to minimize fluctuation, machine with higher accuracy and improve machining quality. Plus, wear-out of the cutting tool can be reduced, allowing for stable machining accuracy for a long time.

$$\delta = \frac{C \times L^3}{D^4}$$

δ : Deflection L : Tool Length
C : Constant D : Tool Shaft Diam.



With the same shaft diameter and half the tool length, deflection amount is 1/8.



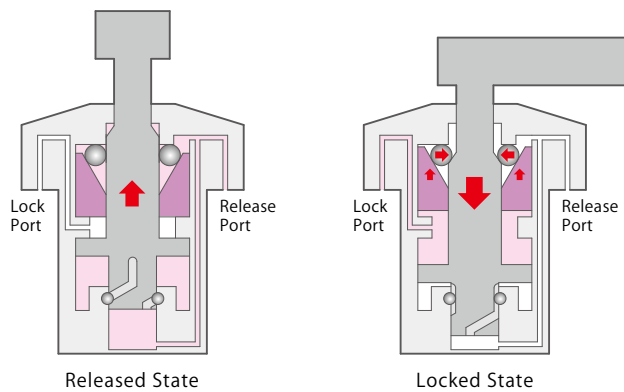
Auto Transferring of a Workpiece

There is no interference even when transferring a workpiece with a gantry loader or multi-joint robot.

High-Power Clamp PAT.



Hydraulic Pressure + Mechanical Lock



This size (full scale) exerts

Clamping Force **3.7 kN** Holding Force **4.6 kN**

※ When supply hydraulic pressure is 5 MPa and lever length is 60 mm.

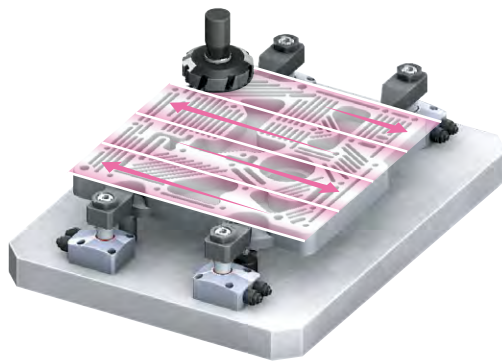


Compact body with powerful clamping force allows for multi-workpiece layout!



Able to use machining area at the maximum!

Stronger Clamping Force, Better Machining Conditions!



General Clamp

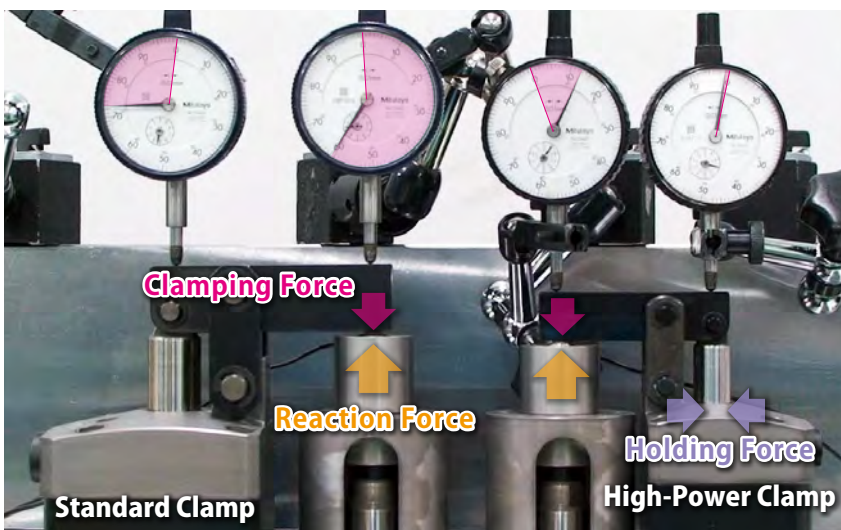


High-Power Clamp

$$\text{Cutting Speed } Vc = \pi \times \text{Milling Diameter} \times \text{Number of Rotations}$$

Ex.) Doubling the milling diameter doubles the cutting speed!

Withstand the reaction force with holding force.

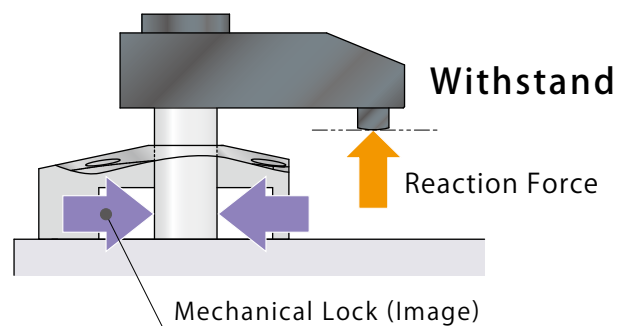


	Standard Link Clamp Model LKA0650	High-Power Link Clamp Model LKE0480
Clamping Force	2.08 kN	1.98 kN
Holding Force	-	3.04 kN

Supply Hyd. Pressure : 3 MPa

Reaction Force : 3 kN

Even with the same clamping force, displacement to the reaction force differs significantly. High-power holding force will control fluctuation, resulting in longer operational life of tools.



Double Piston Swing Clamp

Model LHD

We offer the Double Piston Swing Clamp that exerts a high power with a double piston structure (but without holding force).

Long stroke allows for different clamping heights of workpieces on the same application.

4. Machining Line Automation

Air Sensing Clamp

Action confirmation is indispensable for automation.
Confirming clamp conditions by detecting work clamp actions allows for securely using with transfer devices.



Robotic Hand Changer

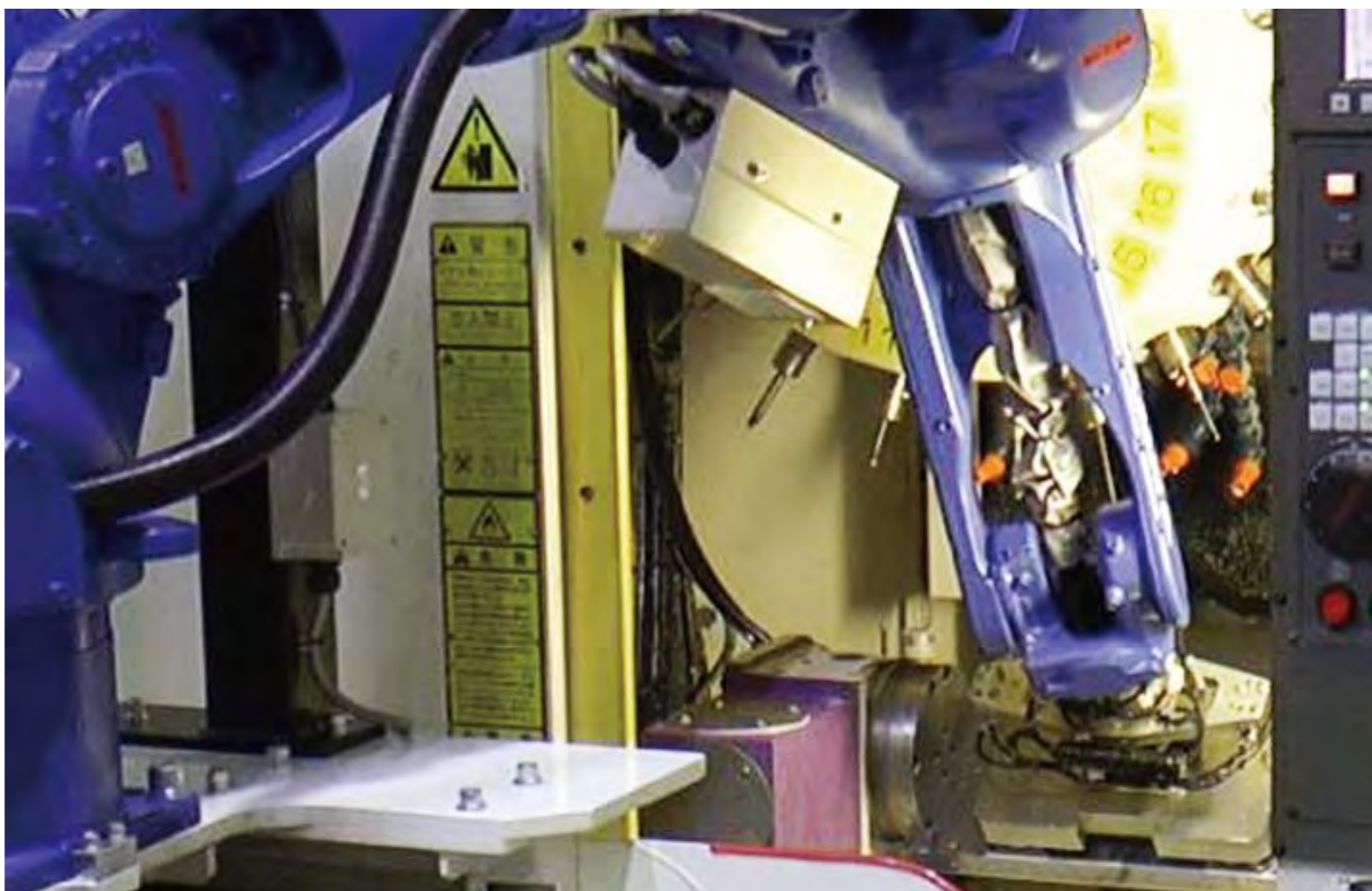
Robotic Hand Changer Designed to Meet Machining Demands
It can be safely used even under environment with coolant, cutting chips, and etc.



The Products for Stable Automation of General-Purpose Machines

Expansion Locating Pin

When loading a workpiece on a machining fixture, the expansion locating pin enables both stable loading (automation) and high accurate locating.



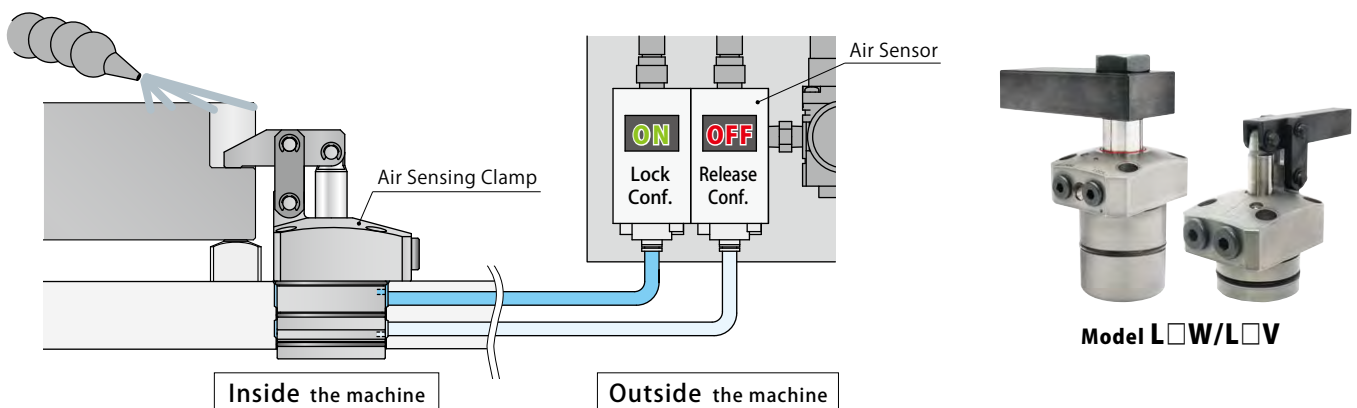
Robotic Hand

Kosmek robotic hands are compact even for the usage in the machining environment and for the aluminum die-casting workpieces in a complicated shape.

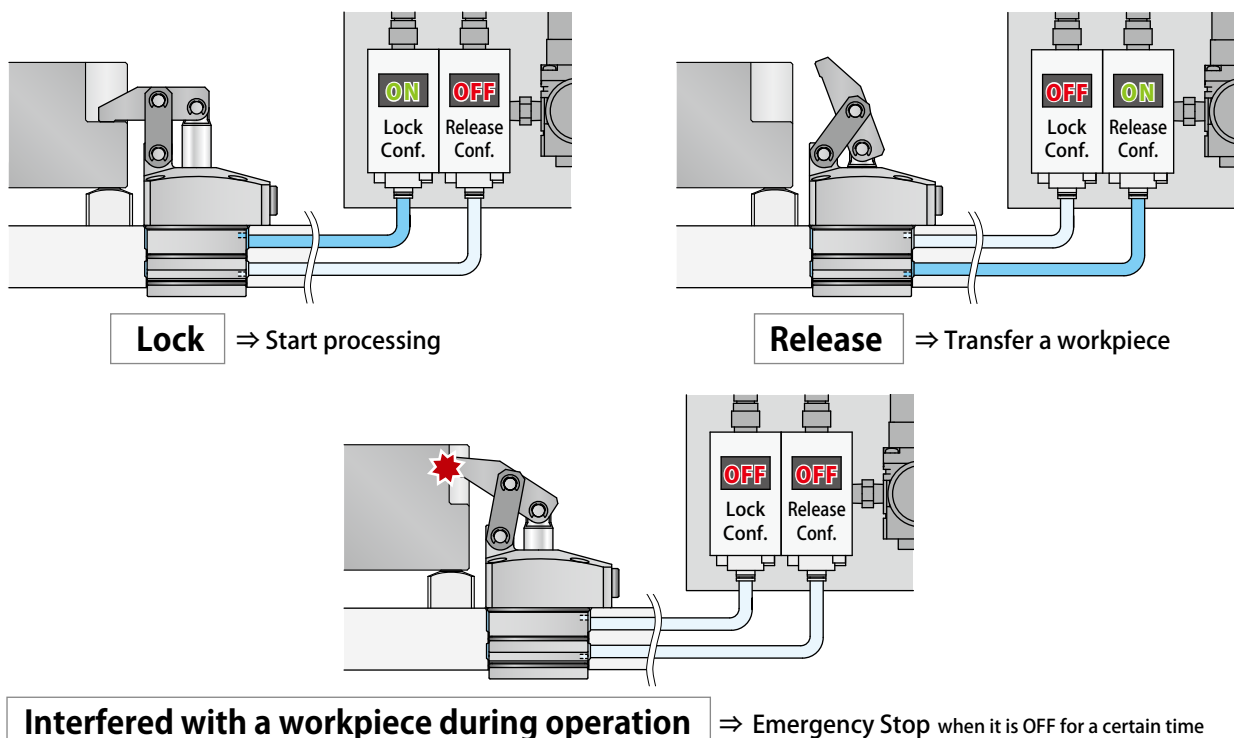


Air Sensing Clamp PAT.P.

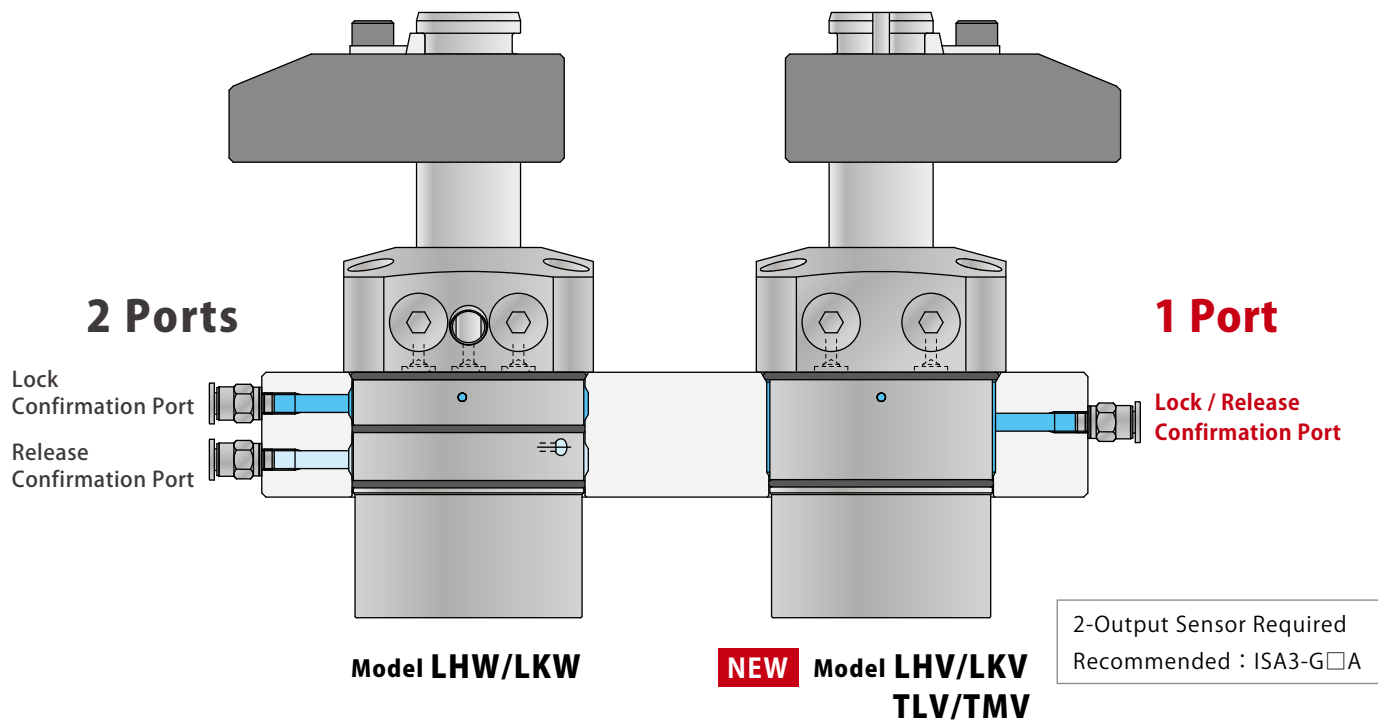
Detecting three states of a clamp (locked, released and in use) results in secure operation with workpiece transfer equipment and machine tools.



With KOSMEK clamp, it is able to check clamp actions by using air pressure provided via built-in valve function. Sensors can be placed outside a machine for stable action under machining environment.



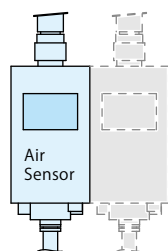
Even when the number of ports is limited, one air port checks lock and release actions! 1-Port Sensing Clamp



Minimized Number of Sensors

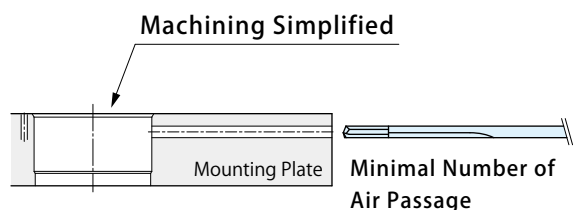
Using with a two-output air sensor allows for one sensing air port, checks both lock and release actions and reduces the number of sensors.








1-Port Sensing Reduces the Number of Sensors



Minimized Number of Ports • Simple Machining

Integrating ports allows for reducing the number of ports of a rotary joint and machining for air passage of a fixture plate, and they simplify the machining of a mounting hole, etc.



	 Model LHW	 Model LKW	 Model LFW	 Model LHV	 Model LKV	 Model TLV-2	 Model TMV-2
Classification	Double-Acting Swing Clamp	Double-Acting Link Clamp	Double-Acting Link Clamp Lever Retraction	Double-Acting Swing Clamp	Double-Acting Link Clamp	Double-Acting Swing Clamp	Double-Acting Link Clamp
Op. Pressure Range	1.5 ~ 7MPa	0.5 ~ 7MPa	1.0 ~ 7MPa	1.5 (2.0) ~ 7MPa	1.0 ~ 7MPa	7 ~ 35MPa	3.5 ~ 35MPa
Required No. of Sensors	2	2	1※	1	1	1	1
Both-side Detection	○	○	—	○	○	○	○
One-side Detection	○	○	○※	—	—	○	○

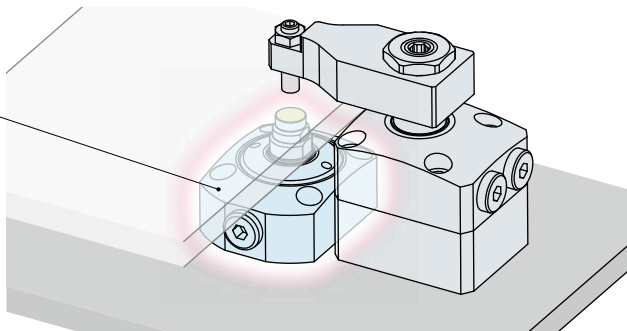
※ Release action confirmation only.

Air Sensing Work Support

The World's First Work Support Action Detection!

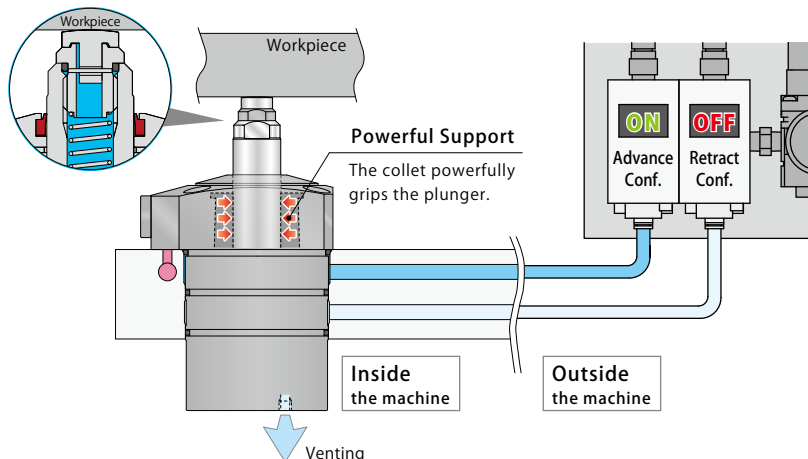
Possible to detect actions of the work support installed behind a workpiece.

Air Sensing Work Support
(Lock/Release Detection)
Model LCW



Model LCW

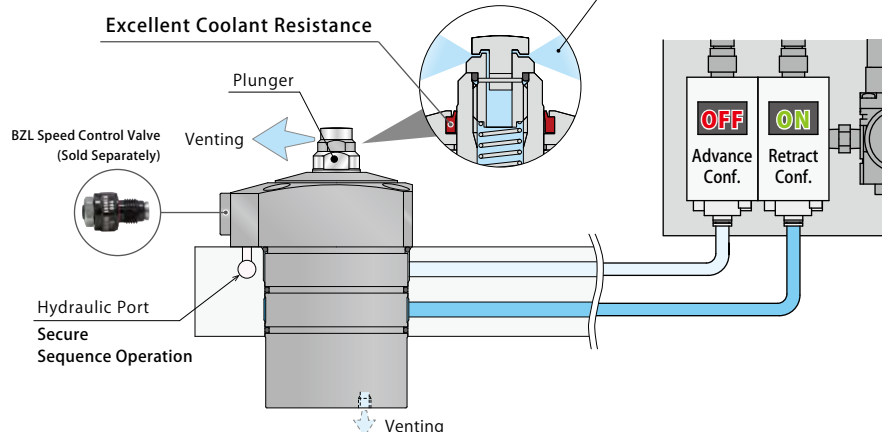
Sensor Pad Part
CLOSE (ON)



Hyd. Pressure	Advance Confirmation Air Sensor	Retract Confirmation Air Sensor
ON	ON	OFF

When releasing, the air purge function cleans the inside with lock confirmation air.

Sensor Pad Part
OPEN (OFF)



Hyd. Pressure	Advance Confirmation Air Sensor	Retract Confirmation Air Sensor
OFF	OFF	ON

Expansion Locating Pin

Large Expansion Model

Enables both Smooth Loading/Unloading and High Accuracy Locating

KOSMEK expansion locating pin absorbs variations in machining reference holes and reference hole distance. This enables high accuracy locating and stable automation.



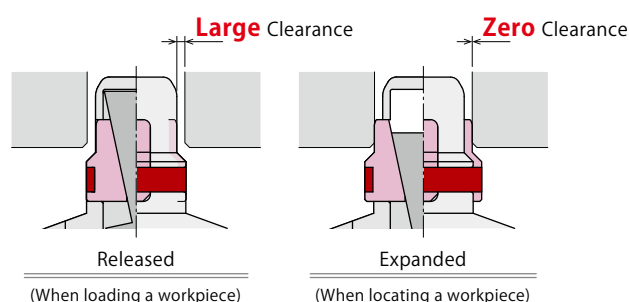
Model VFH

We also offer High Accuracy Model with $3\mu\text{m}$ locating repeatability.



Model VFM

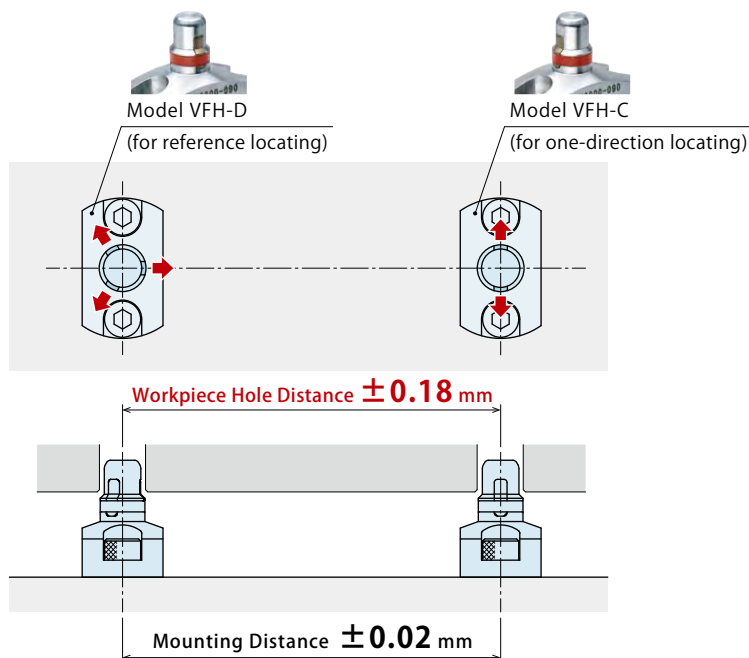
When expanded : **1.1mm**



Locating Repeatability : **$10\mu\text{m}$**

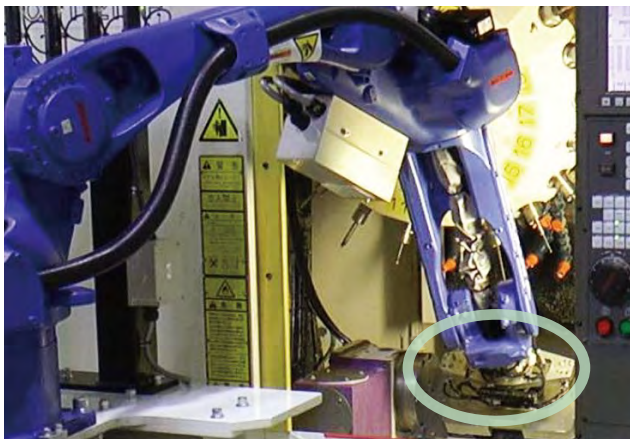
Ex.)

For a workpiece hole $\phi 10^{+0.05}_0 \text{ mm}$,
 Mounting Distance of
 Expansion Locating Pin: **$\pm 0.02\text{mm}$**
 Allowable Workpiece Hole Distance
 Variance: **within $\pm 0.18\text{mm}$**



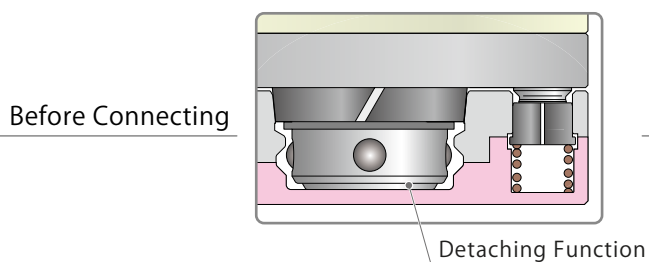
Robotic Hand Changer PAT.

KOSMEK Robotic Tool Changer Designed to Meet the Demand for Machining!

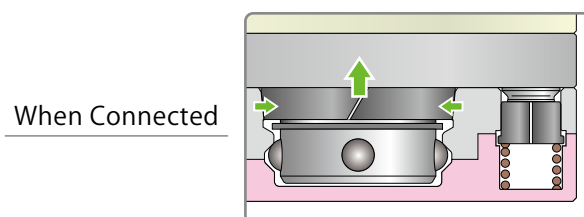


Model SWR

KOSMEK Exclusive Non-Backlash Mechanism



Before Connecting



When Connected

Zero-Backlash Connection with Dual Contact

Backlash of a Tool Changer Causes Electrode Errors
Such as noises and continuity failure due to friction of contact probes

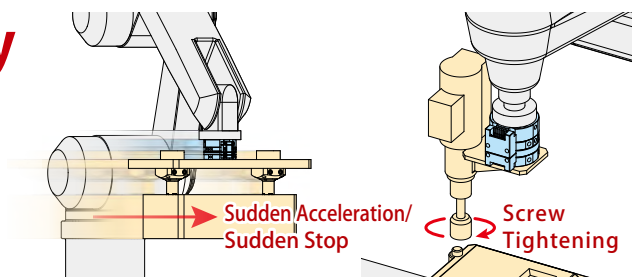
Kosmek Hand Changer with No Backlash
Prevents Electrode Errors

Uncomparably High

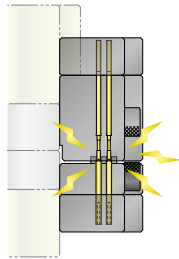
Rigidity & Durability

Strong to "bend" and "twist" with high rigidity obtained by non-backlash function.

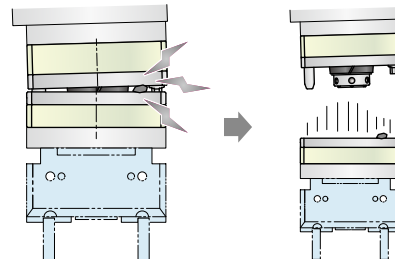
Also, high strength material is used in all the contact parts of the master and the tool so that it ensures high durability and 3 μ m locating repeatability even after 1 million cycles.



Contaminants such as coolant mist and cutting chips cause errors during machining.



Cutting chips and coolant enter into the electrode part, causing short circuit of the electrode and momentary stops...

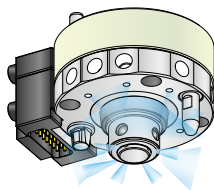


Catching cutting chips when connecting causes clamping failure, resulting in dropping a workpiece during transfer.

**Designed to meet the machining demands,
KOSMEK tool changer is able to detect and prevent various troubles!**

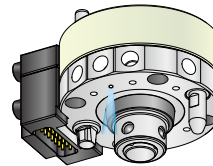
Air Blow

Air blow from the inside the master side allows for air purge of the master side and air blow to the tool side.



Connection Check

Even when contaminants enter into the SWR, the contact check of the connecting surface prevents troubles before they happen.



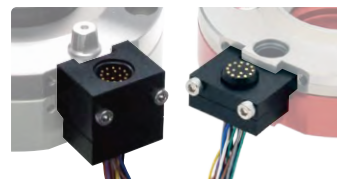
**Offering Waterproof Electrodes rated IP67 and IP54
to prevent electrode troubles!**

IP67



Noncontact Waterproof

IP54



Simple Waterproof

Robotic Hand Changer Lineup



from 0.5kg Payload  to 360kg Payload

Applicable Payload	0.5 ~ 1 kg	1 ~ 3 kg	3 ~ 7 kg	7 ~ 12 kg	12 ~ 25 kg	25 ~ 50 kg	50 ~ 75 kg	75 ~ 120 kg	120 ~ 360 kg
Recommended Payload	0.5kg	3kg	7kg	12kg	25kg	50kg	75kg	120kg	230kg
Model No.	SWR0010	SWR0030	SWR0070	SWR0120	SWR0250	SWR0500	SWR0750	SWR1200	SWR2300

※ Only SWR0010 has repeatability of 5 μm.

Robotic Hand

High-Power Pneumatic Clamp PAT.

Light and Compact Transfer Hand for Irregular Shaped Workpieces

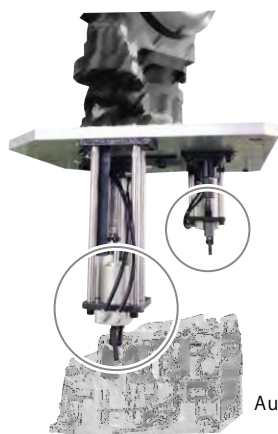
High-Power Pneumatic Link Clamp



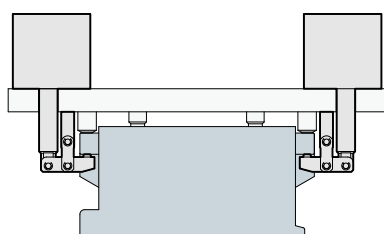
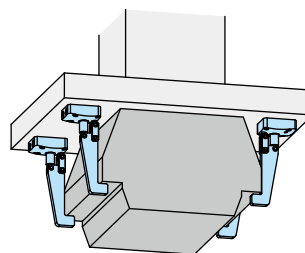
Model WCE

Compact and Powerful High-Power Clamp with Self-Locking Function

Compact and high-power clamp cylinder with exclusive mechanical locking structure.
Internal self-locking holds a workpiece even when air supply is stopped.
Introduced as a transfer hand for irregular shaped workpieces.



Automobile Component



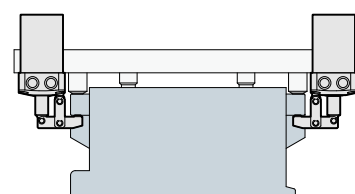
General Pneumatic Cylinder

Heavy • Large

Fixture Weight
About 10% Reduced

※ Reference when the size
of the workpiece is 300×260.

Exerts Equivalent Clamping Force
with Mechanical Lock



High-Power Pneumatic Clamp

Light • Compact • Powerful

Reduce a Load to Transfer Equipment

Light and Compact Transfer Hand for Heavy Workpieces

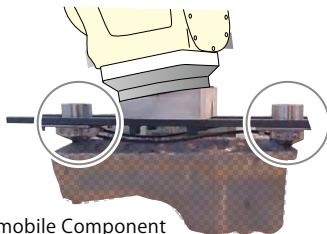
High-Power Pneumatic Hole Clamp



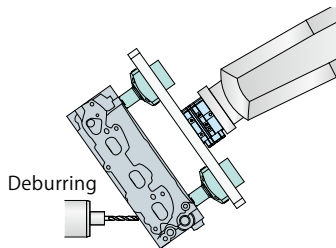
Model SWE

Save Energy with Lighter Hands

Reducing the weight of the hands speeds up the robot and maximizes utilization of its payload leading to downsizing of the robot size.



Automobile Component



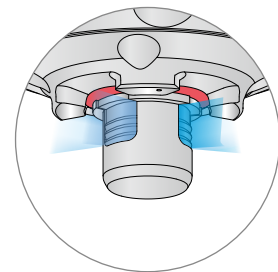
Deburring

Transfer the Heavy Workpiece with Light Hands

5 Faces Accessible with No Interference

Air Blow

The air blow function cleans the product itself and a workpiece hole.



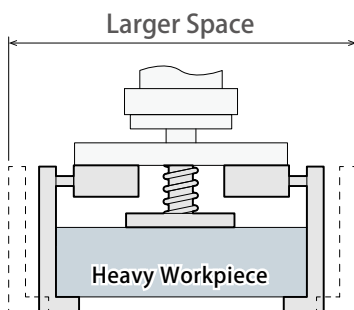
The gripper expands and pulls a workpiece in.



Clamping Force **2 kN** (Air Pressure : 0.45 MPa)

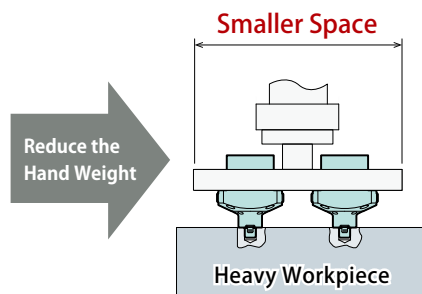
Even at zero pressure, it will stay locked with internal spring and prevent falling of workpieces.

Clamping Force at 0MPa **0.25 kN**



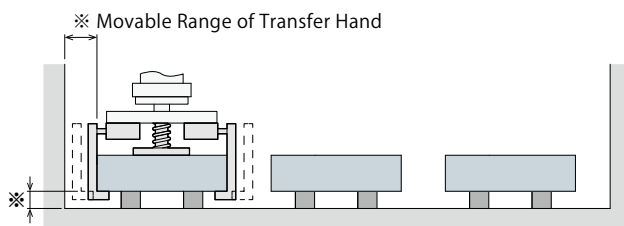
Loading/Lifting Hand with Linear Cylinder

Heavy • Large

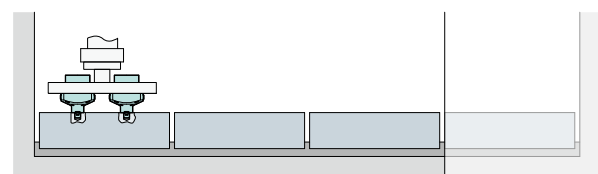


High-Power Pneumatic Hole Clamp

Light • Compact • High Accuracy
Self-Lock Function to Ensure Safety



Loading/Lifting Hand with Linear Cylinder

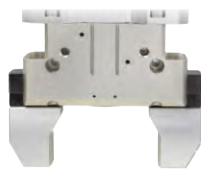


High-Power Pneumatic Hole Clamp

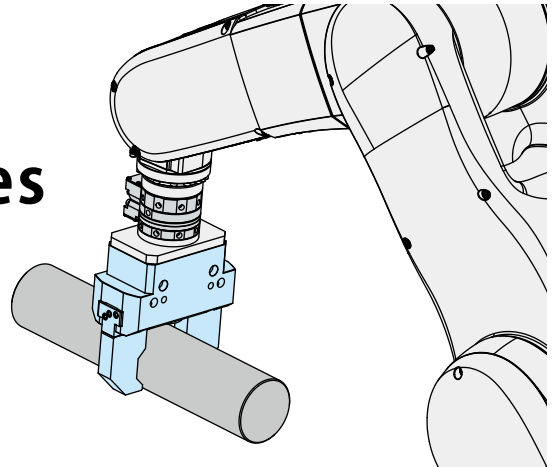
No movable range of transfer hands means the reduction of the storage space for workpieces.

Robotic Hand Parallel Hand with Auto-Grip Changer

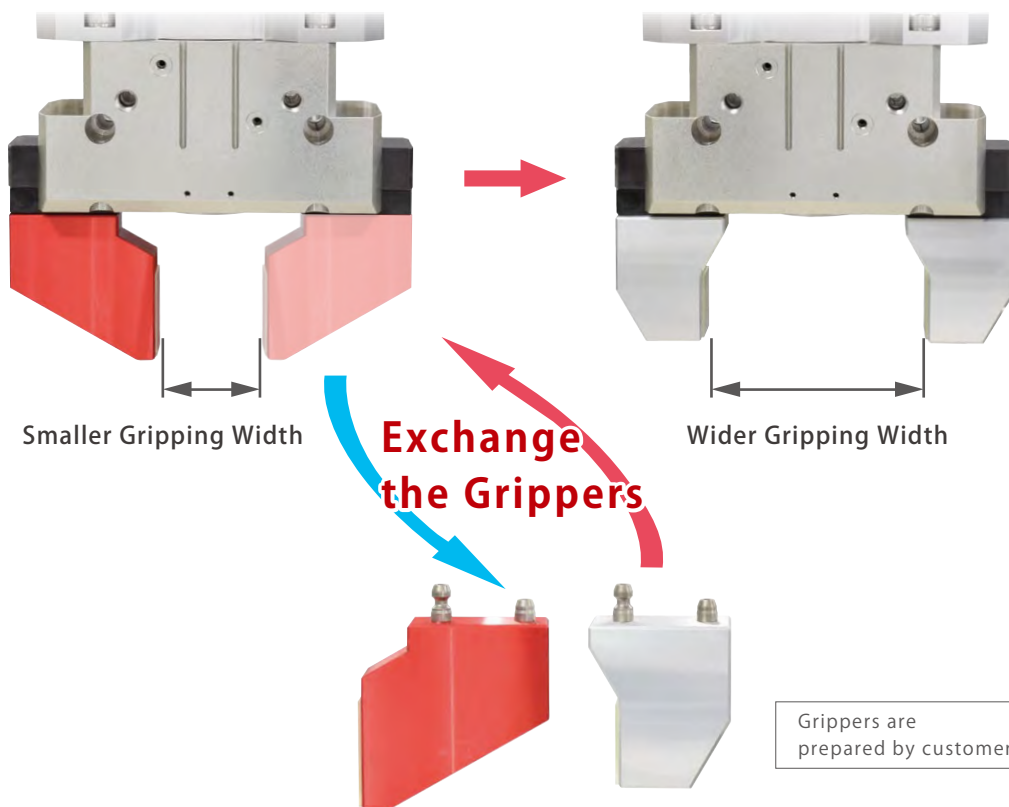
For Loading Cylindrical Workpieces



Model WPW



Gripper Change Allows for Multi-Size Workpieces

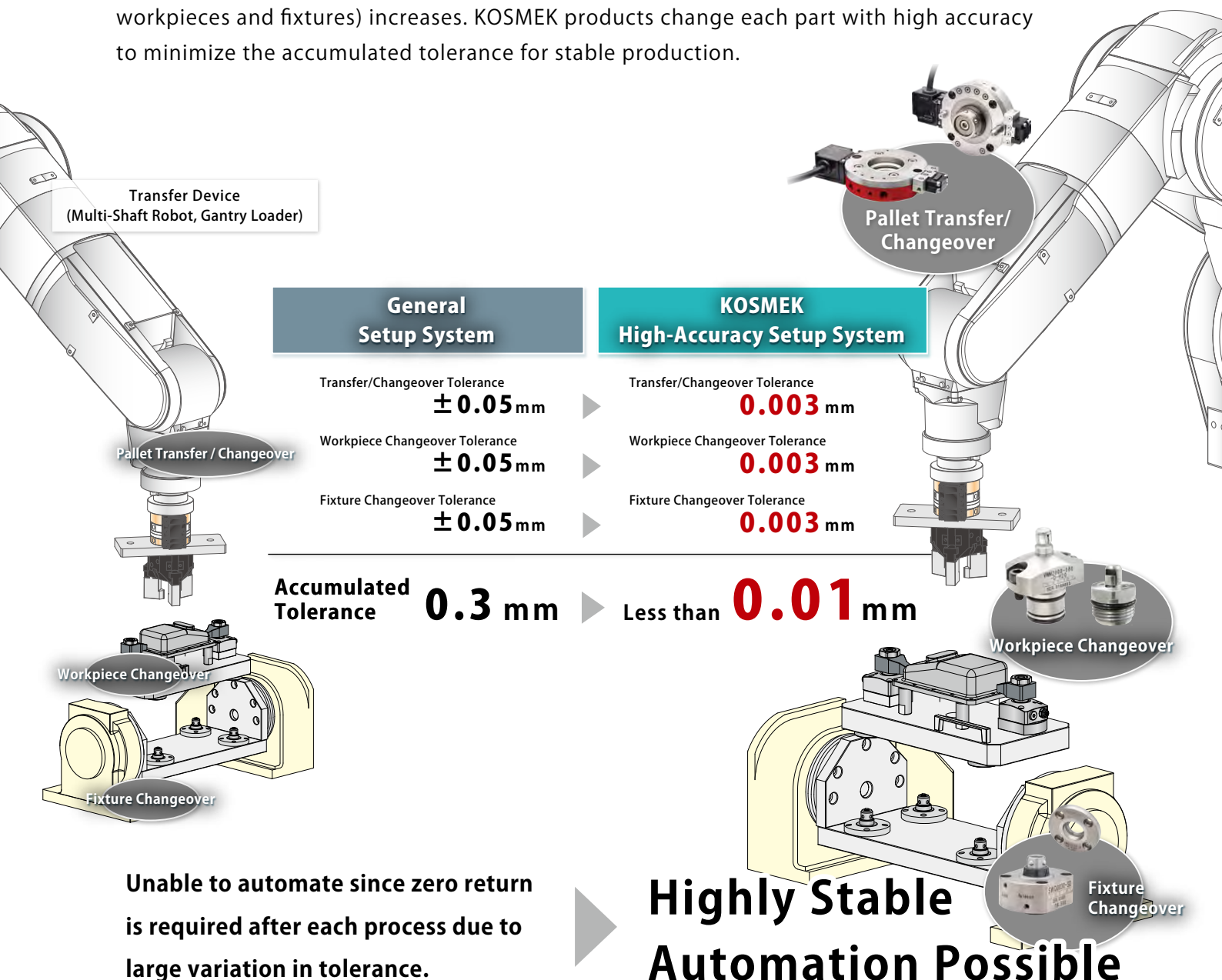


A long-stroke chuck can grip several types of cylindrical workpieces, but the hand may become heavy and interfere with equipment. The parallel hand with auto-grip changer enables to change only the grippers of the parallel hand, allowing for a variety of workpieces.

Stable Automation with KOSMEK High-Accuracy Setup System

Instant High-Accuracy Locating and Powerful Clamping

Accumulated tolerance is increased as the number of changing parts (such as robotic hands, workpieces and fixtures) increases. KOSMEK products change each part with high accuracy to minimize the accumulated tolerance for stable production.



KOSMEK Products to Enhance

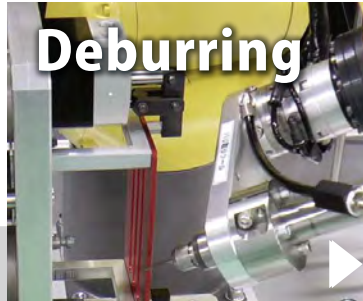
Casting Components



Die Clamping Cylinder



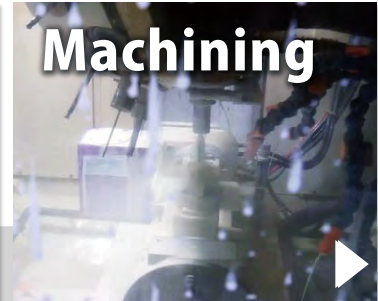
High-Speed Core Pull Cylinder



Work Clamp



Robotic Hand Changer



Work Clamp



Expansion Locating Pin



Pallet Clamp

Sheet Metal Components



Die Clamping Cylinder



Robotic Hand Changer



Work Clamp for Welding Equipment

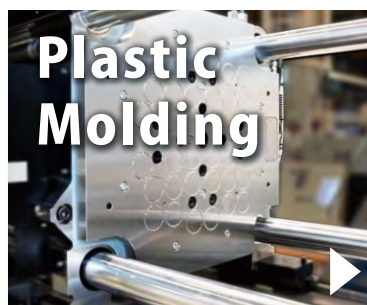


Robotic Hand



Robotic Hand Changer

Resin Components



Mold Clamping Device

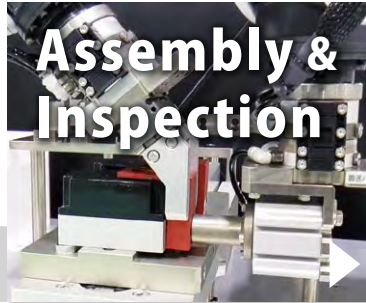


Robotic Hand Changer

Productivity in Every Process



Washing



Assembly & Inspection



Work Clamp for Washing Equipment



Robotic Hand



Robotic Hand Changer



High-Power Pneumatic Clamp

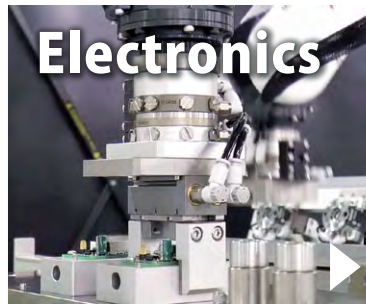


Expansion Locating Pin



Robotic Hand Changer

Electronic Components



Robotic Hand



Expansion Locating Pin



Robotic Hand Changer



MEMO

MEMO

Company Profile



KOSMEK LTD. Head Office

Company Name	KOSMEK LTD.
Established	May 1986
Capital	¥99,000,000
President	Tsutomu Shirakawa
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, MUFG Bank, The Senshu Ikeda Bank

Sales Offices

Sales Offices across the World

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Overseas Sales

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盈生貿易有限公司

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16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511
台湾新北市中和區建八路2號16F-4 (遠東世紀廣場)

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Osaka Sales Office
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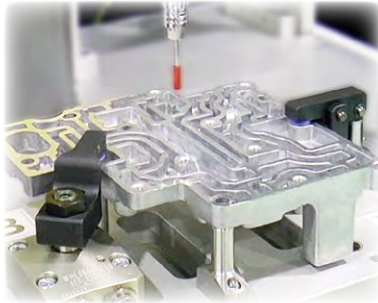
Nagoya Sales Office

TEL. 0566-74-8778 **FAX. 0566-74-8808**
〒446-0076 愛知県安城市美園町2丁目10番地1

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〒812-0006 福岡県福岡市博多区上牟田1丁目8-10-101

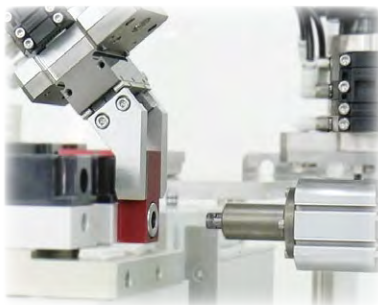
Our Products



KOSMEK WORK CLAMPING SYSTEMS

Machine Tool Related Products

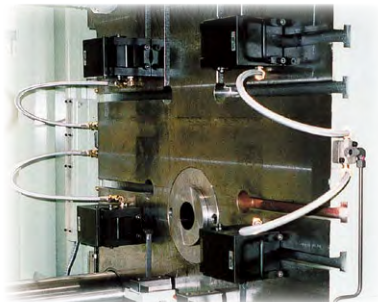
Our clamping system enables boltless automation to load and unload workpieces easier.
 Non-leak valve enables the use of hydraulic source and fixtures in a disconnected condition after locking (clamping action).
 We offer a wide range of products such as hydraulic/pneumatic actuators, supports, positioning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



DIECAST CLAMPING SYSTEMS

For Diecast Machines

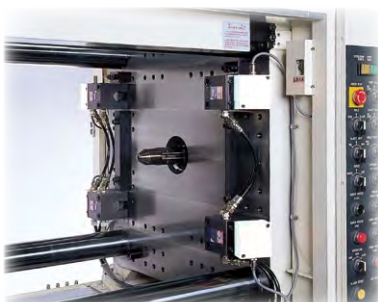
Kosmek Diecast Clamping Systems (KDCS) save the time of the changeover of die casting and magnesium molding machines under severe conditions. ex) mold release agents and high temperature.



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

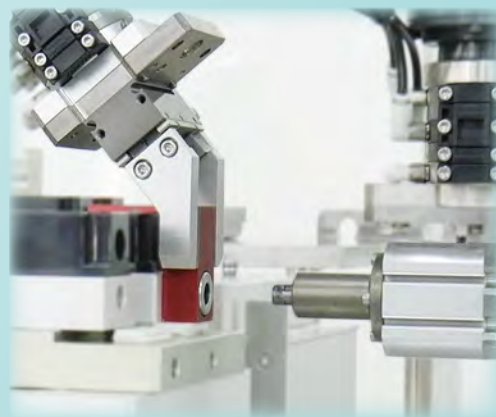
For Injection Molding Machines

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.

Robotic Hand Changer, Robotic Hand, Locating Equipment and other products to improve automation, precision and setup of transfer, assembly, deburring, testing and various other processes.

FA • Industrial Robot Related Products

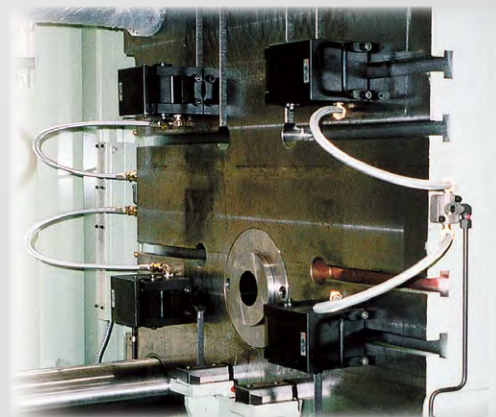
Factory Automation



Kosmek diecast clamping systems for die casting and magnesium molding machines subjected to severe environment caused by exposure to mold release agents and high temperature, etc. Our best-selling hydraulic clamps and units have been updated for ensuring a safer and more reliable mold change system.

Kosmek Diecast Clamping Systems

For Diecast Machines



KOSMEK LTD.

► <http://www.kosmek.com/>

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- For Further Information on Unlisted Specifications and Sizes, Please call us.
- Specifications in this Leaflet are Subject to Change without Notice.

