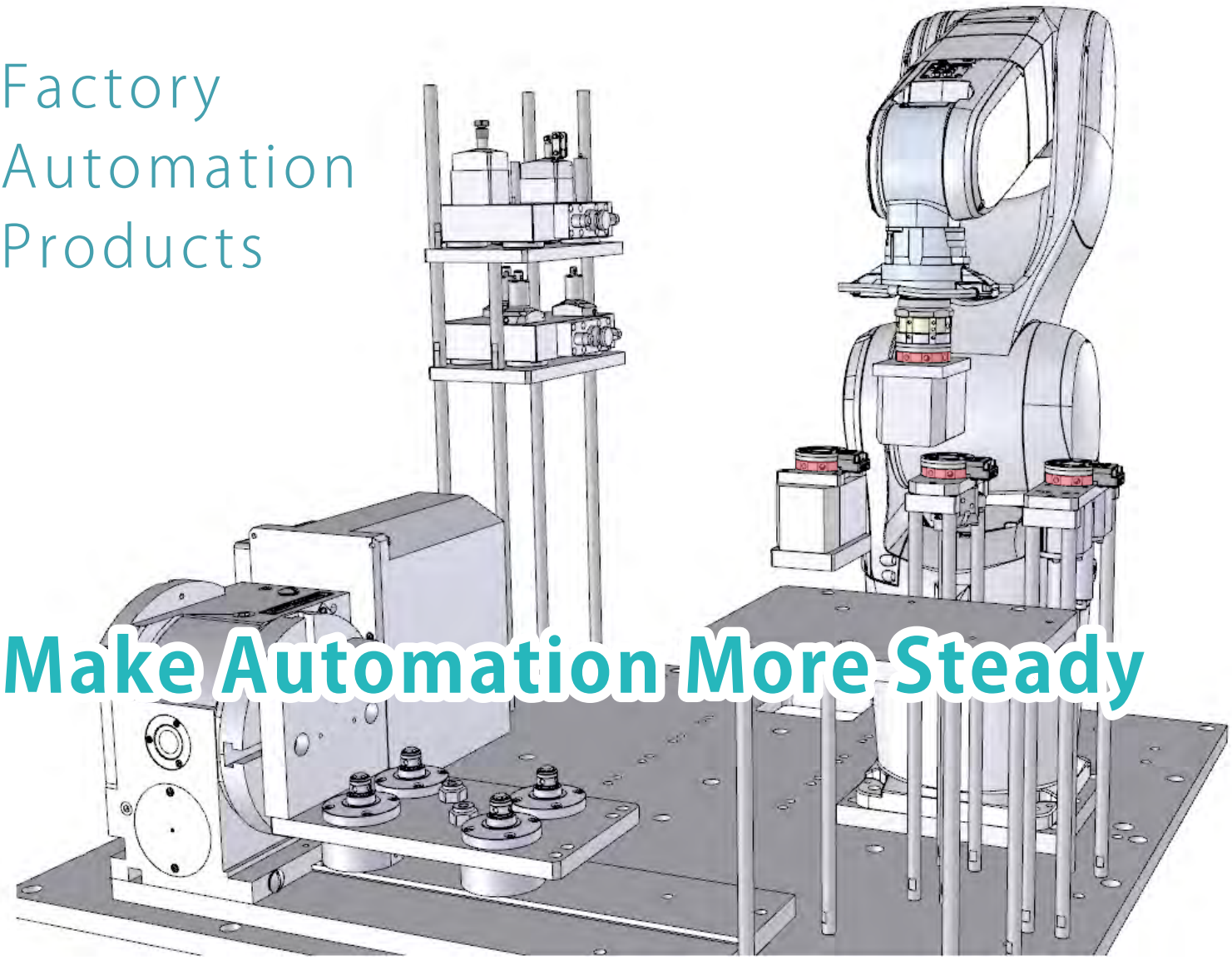
FA • Industrial Robot Related Products

APPLICATION EXAMPLES

– SPECIAL EDITION –

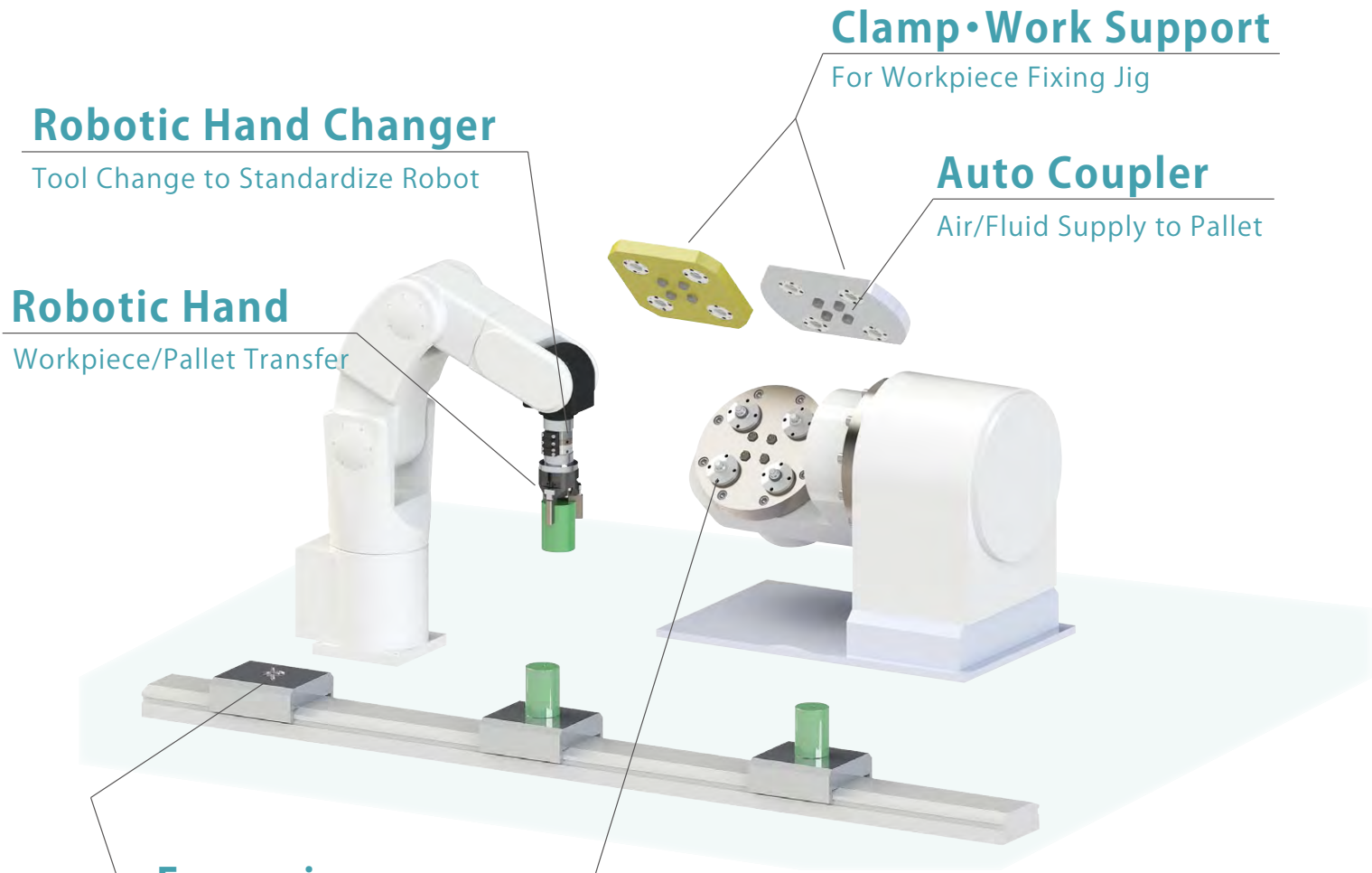
Factory Automation Products



Make Automation More Steady

KOSMEK
Harmony in Innovation

KOSMEK Products for Automation and Setup Improvement in Every Process



Clamp•Work Support

For Workpiece Fixing Jig

Robotic Hand Changer

Tool Change to Standardize Robot

Auto Coupler

Air/Fluid Supply to Pallet

Robotic Hand

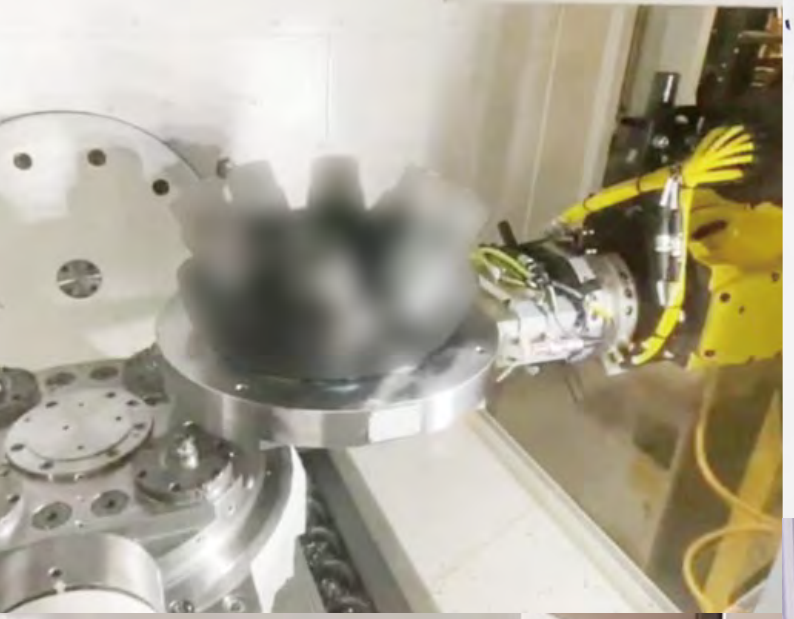
Workpiece/Pallet Transfer

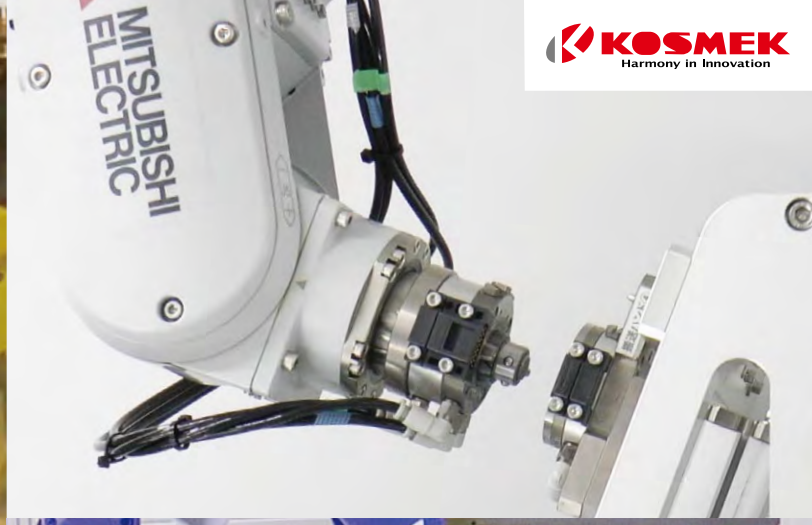
Expansion Locating Pin

High-Accuracy Locating of Workpiece

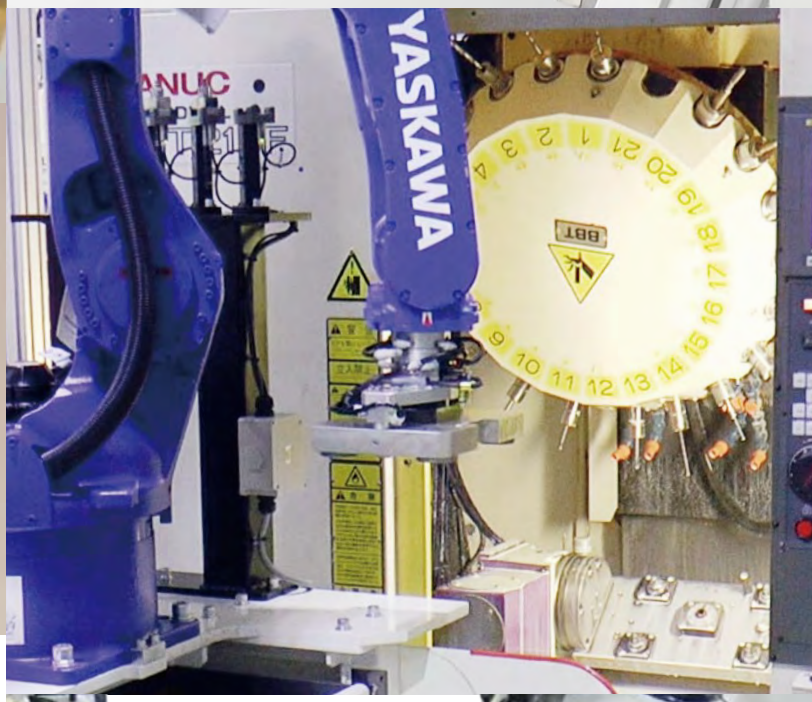
Pallet Clamp / Location Clamp

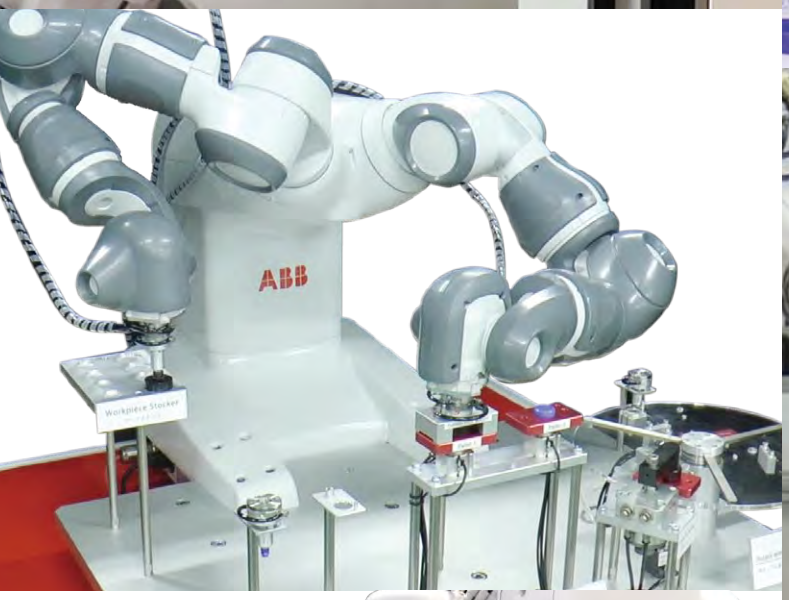
High-Accuracy Pallet Change / Setup Time Reduction




MITSUBISHI
ELECTRIC

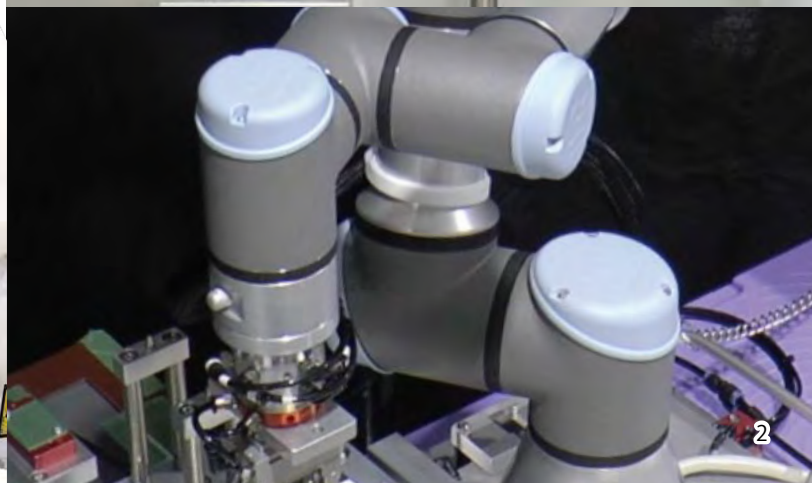

NACHI


YASKAWA



ABB

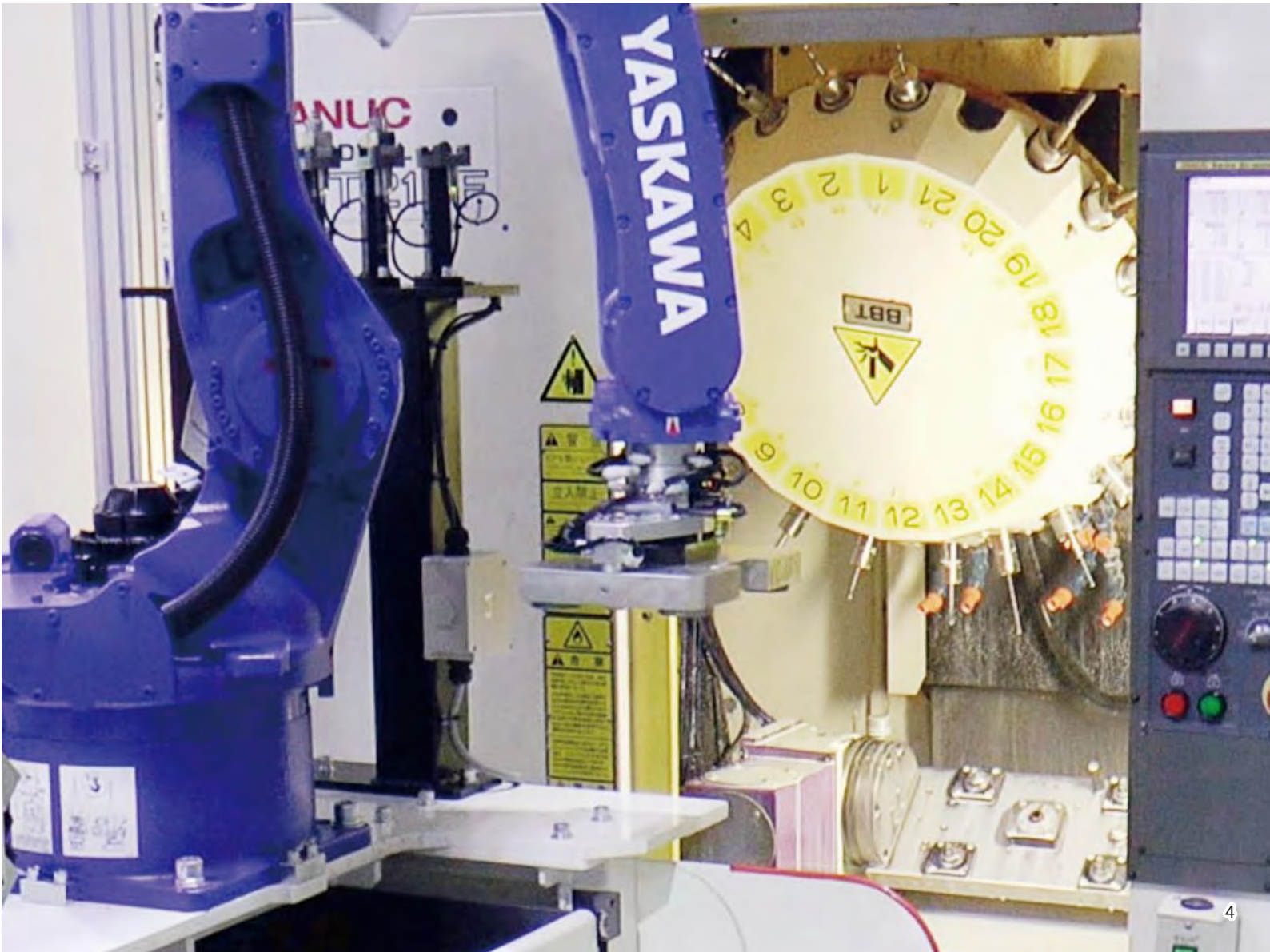

DENSO



Automation

Transfer

AUTOMATION requires the ability to transfer various kinds of workpieces regardless of their shapes. KOSMEK provides transfer hands that are compact yet powerful, and applicable to a wide variety of workpieces, fixtures and pallets.


YASKAWA
ANUC

Automation with Robot

Fixture/Pallet Transfer

Model **WVA**

Pallet Gripper

The moment-resistible gripper is best suitable for pallet transfer.
Enables side-approaching transfer and thus space saving for fixture stocker.
P.7

Model **WPT**

High-Power Pull Stud Clamp

The compact body powerfully locks the pull bolt. Used as
a safe and compact robotic hand with self-locking function.
P.9

Model **WKA**

Ball Lock Cylinder

Used as a simple and super-compact robotic hand that holds
a workpiece with steel balls.
P.10

Automation with Robot
Workpiece Transfer

Model **WKH**

FA Pneumatic Hole Clamp

Reduce the area interfering with a transfer hand!
Used as a robotic hand by holding a workpiece hole, and
a space-saving workholding clamp in various applications.
P.11

Model **SWP**

Locating Pin Clamp

Locating Pin Clamp best suitable for welding application.
Gripper expansion enables stable operation and high locating repeatability.
Used as a robotic hand and a workholding clamp in applications.
P.12

Model **SWE / WCE /WHE**

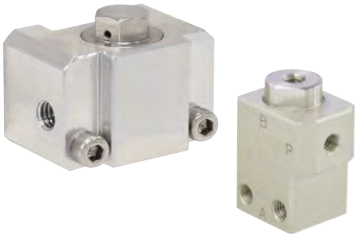
High-Power Clamp Series

Used for transferring irregular-shaped casting workpieces!
Light, compact and powerful robotic hands.
P.13

Model **BWS / SWRA**

Air Safety Valve / Safety Push Valve

Air Safety Valve : Ultra-Compact and -Light Air Pilot Check Valve
to prevent a workpiece fall.
Safety Push Valve：Directly mounted to KOSMEK Robotic Hand Changer,
it prevents a tool fall caused by a valve operating error.
P.16

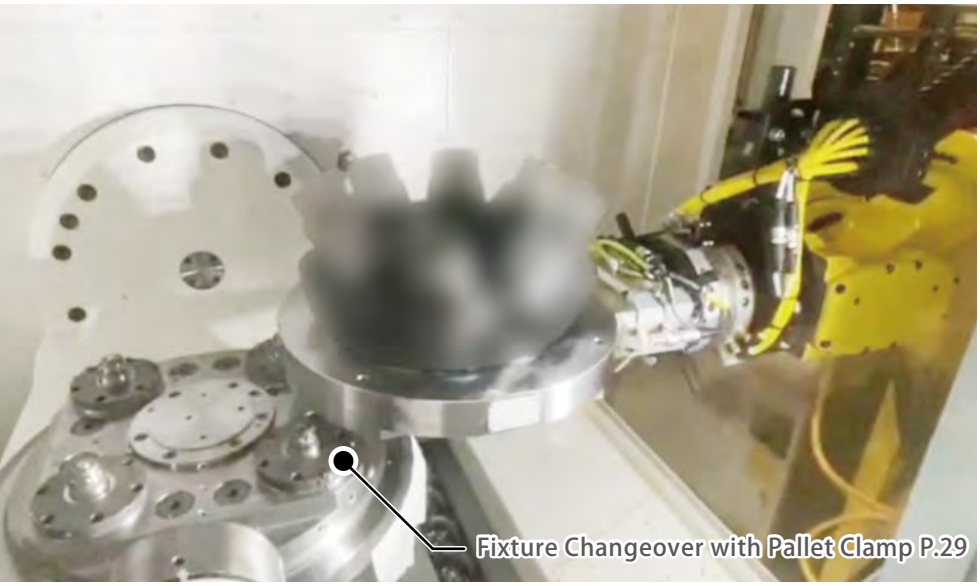


Model **WP□**

External Chuck Series

Standard external chucking series:
High-power and compact chucks with built-in mechanical locking.

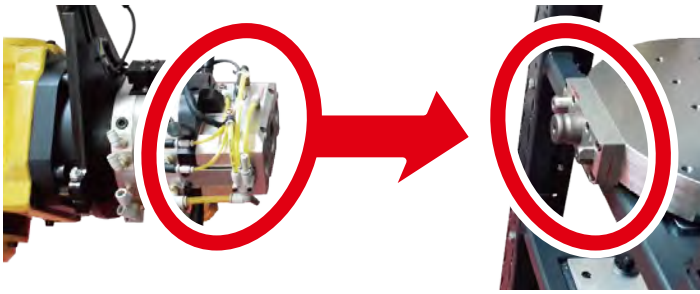
No Interference with Side-Approaching Transfer



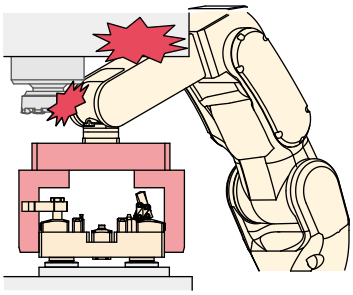
Pallet Transfer
Model **WVA**

Easy to Transfer by Approaching from the Side

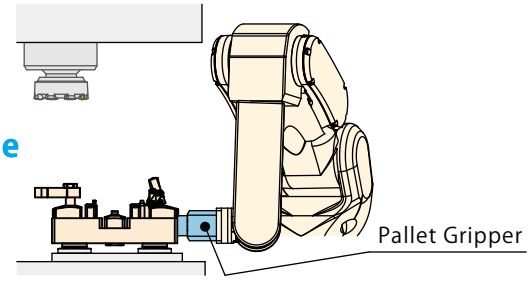
The pallet gripper withstands high moment when approaching to a pallet from the side. Avoid interference even when transferring to a narrow space.



Interference
When approached from the above.

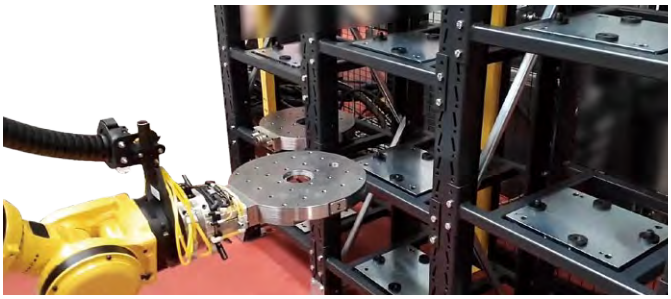


No Interference
When approached from the side.



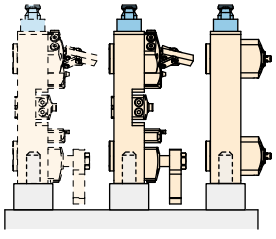
Make Pallet Storing Flexible

Side-approaching saves space for storing pallets and fixtures.

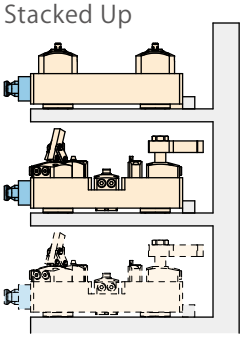


Space-Saving

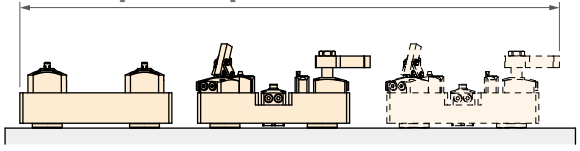
Placed Vertically



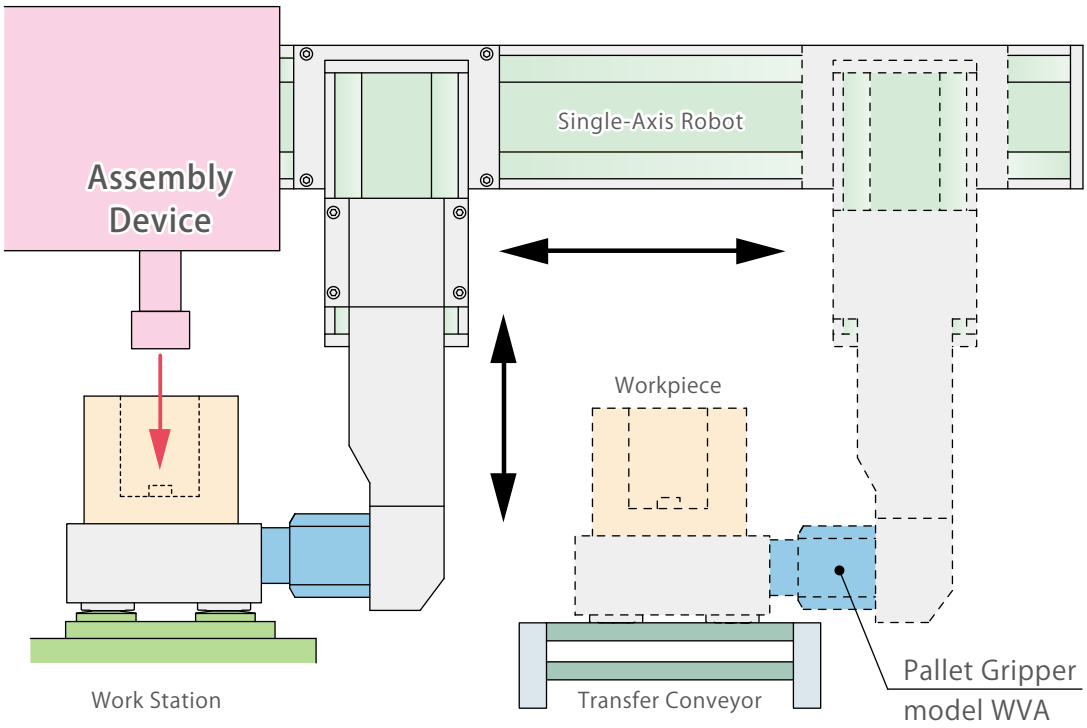
Stacked Up



Placed Flat
Requires space for fixtures.



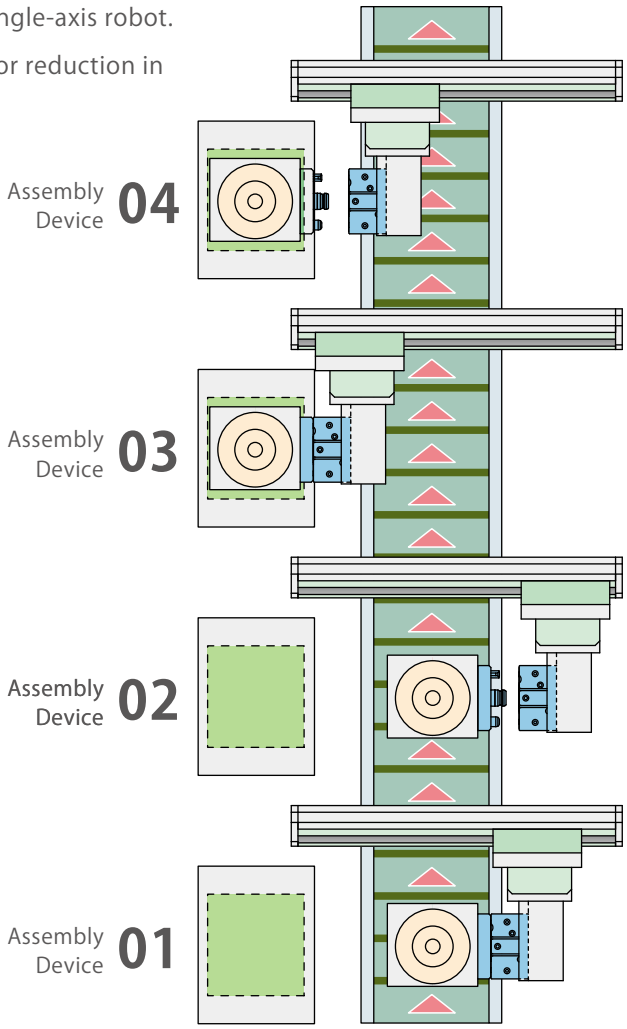
Side-Approaching to Reduce Equipment Cost



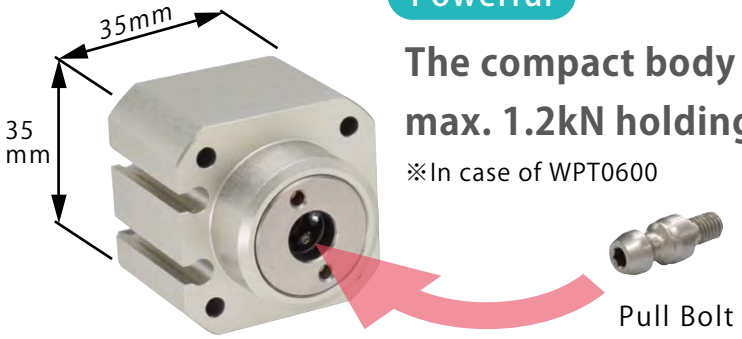
Side-Approaching Reduces Cost for Transfer Device

Easy to transfer into a device even when using with a single-axis robot. Requires less number of robot axes and shorter stroke for reduction in overall equipment cost.

Saves Space and Cost for Lines Requiring Multiple Processes



Easy to Transfer Heavy Workpieces with a Compact Hand

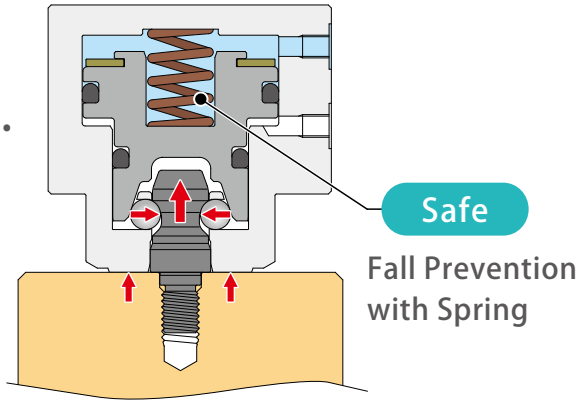


Powerful

The compact body exerts max. 1.2kN holding force.

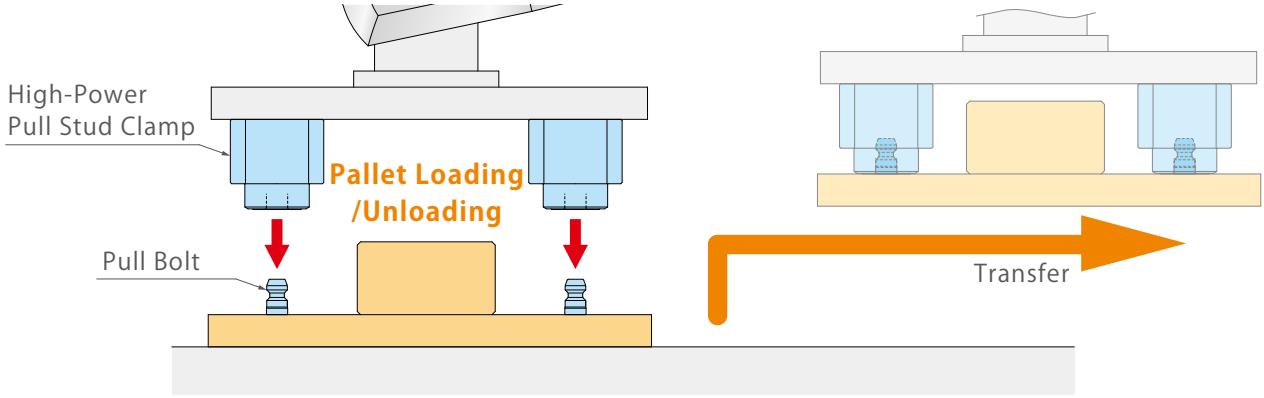
※In case of WPT0600

Pull Stud Clamp Model **WPT**



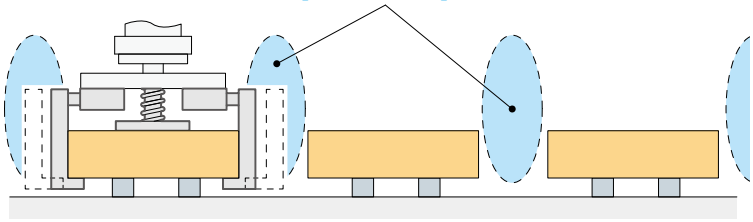
Safe

Fall Prevention with Spring



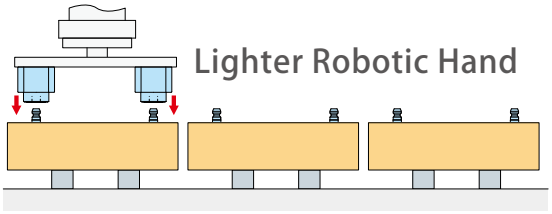
Parallel Hand

Requires Space

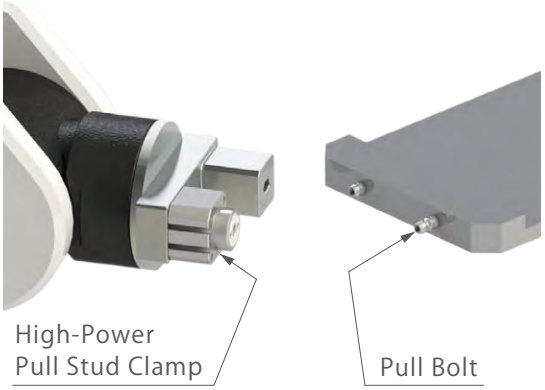


High-Power Pull Stud Clamp

Saves Space for Fixture Stocker

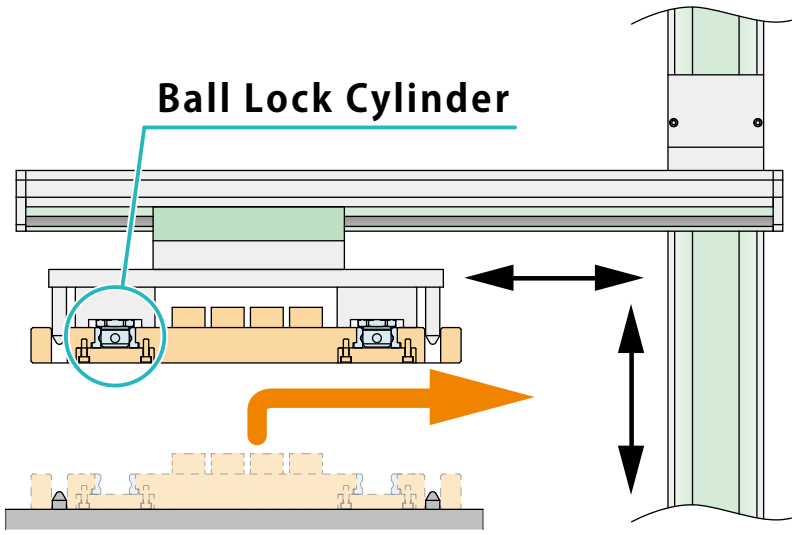


Side-Approaching Hand for Small Pallet



Fixture/Pallet Transfer with a Single-Axis Robot

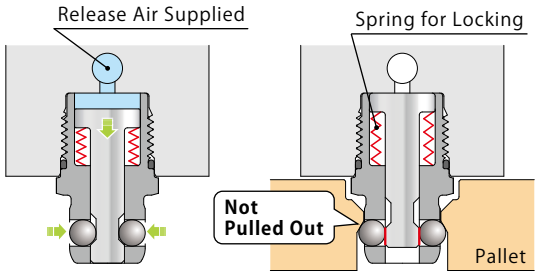
Powerful, Light and Secure Transfer Hand with Mechanical Lock



Ball Lock Cylinder
Model **WKA**

Temporal Holding with Steel Balls

Single-Acting Cylinder locked by spring and released by air

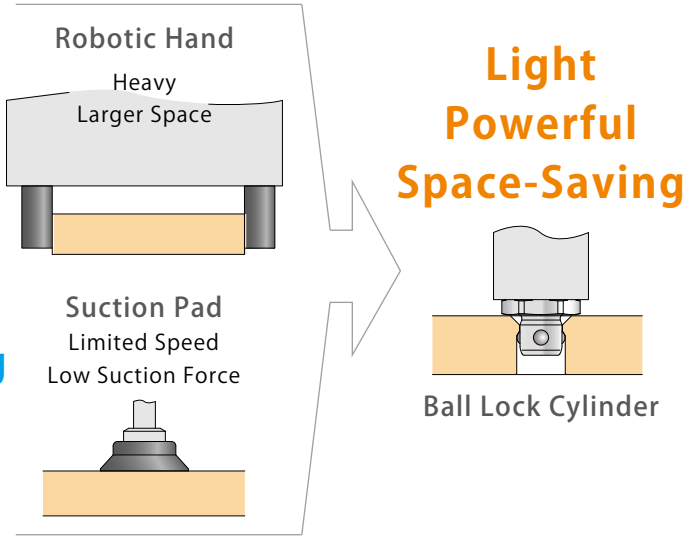


Released (Retracted) Locked (Expanded)

Surprisingly Light and Powerful

- Super-compact and simple single-acting cylinder. The smallest WKA weighs 7g with its payload 5kg.

Model No.	WKA0060	WKA0080	WKA0100	WKA0120	WKA0160
Pull-Out Load Capacity	50N	70N	100N	150N	200N
Product Weight	7g	8g	13g	20g	41g



Securely Transfer with Ball Locking

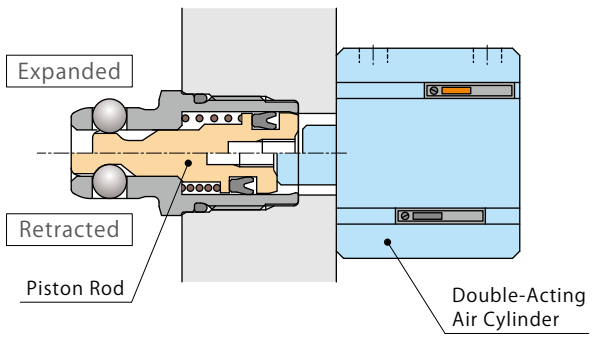
- Different from a vacuum suction pad, Ball Lock Cylinder ensures secure transfer with ball locking function. Also, this cylinder is operated by positive air pressure and thus requires no vacuum generator.

In case you want to :

- **confirm action with auto switch.**
- **control with double action.**

> **The ball lock cylinder can be operated by pushing the internal piston rod from the bottom. Using with air cylinder(s) enables action confirmation with auto switch and double-acting control.**

【Example：Using with an air cylinder】

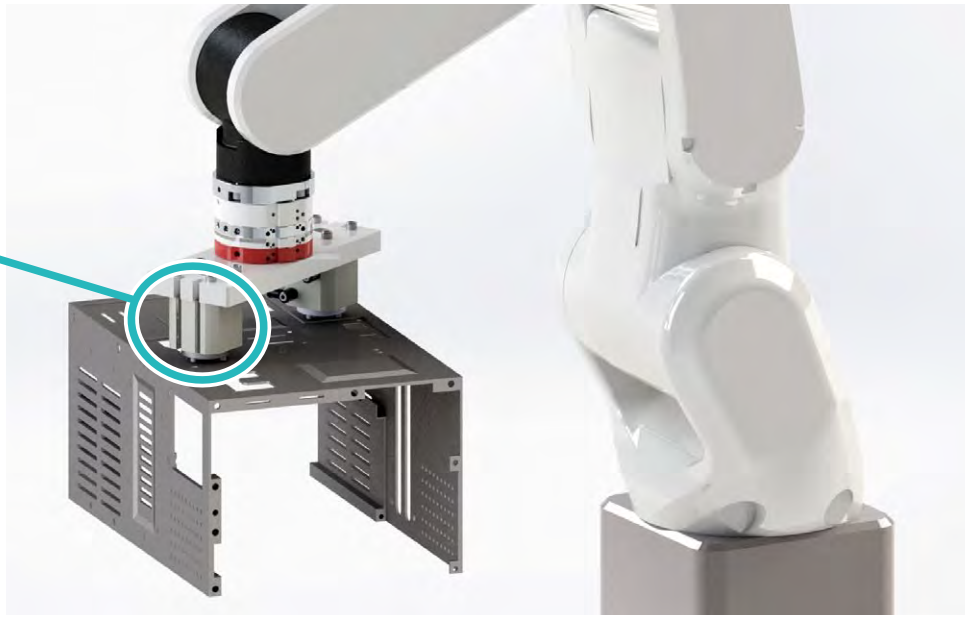


Compact Transfer Hand for Housing Parts

FA Pneumatic Hole Clamp

Model **WKH**

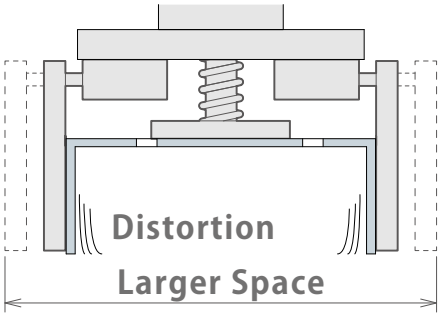
Workpiece Hole Diam.：φ6 ~ φ14



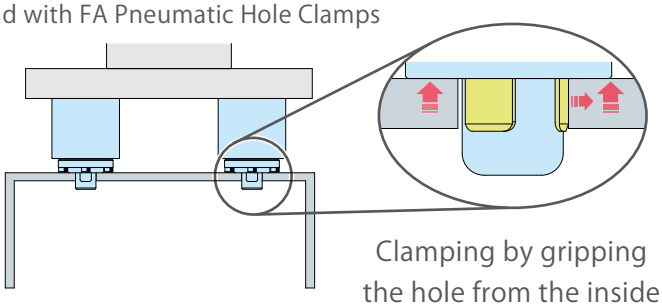
Compact and Gentle-Gripping Transfer Hand

In case of a hand with linear cylinders, the cylinders and the hand become larger as workpieces become larger. Gripping force also has to be stronger, but the strong gripping force causes a workpiece to distort when gripped. FA pneumatic hole clamp enables to grip specific workpiece holes, leading to less distortion of the workpiece and reduction in size and weight of the transfer hand.

Hand with Double-Acting Cylinders



Hand with FA Pneumatic Hole Clamps



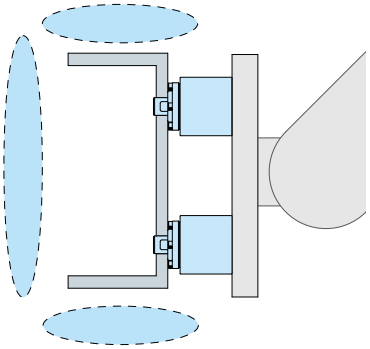
Clamping by gripping the hole from the inside

Compact and Simple

Easy to Assemble without Interference around Workpiece

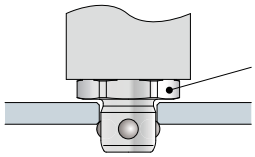
FA Pneumatic Hole Clamp makes assembling with other parts and appearance testing easy because there is no interference around workpiece except the gripping surface.

Easy to Approach



For Even More Compact Hand

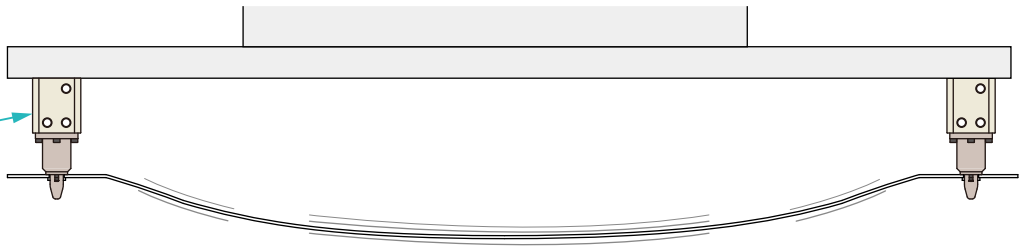
FA Pneumatic Hole Clamp securely grips a workpiece hole. However, when gripping is not required, you can make a transfer hand even more compact by using Ball Lock Cylinder that simply holds a workpiece with steel balls.



Ball Lock Cylinder

Model **WKA**

Assembly Line for Automobile Exterior Parts

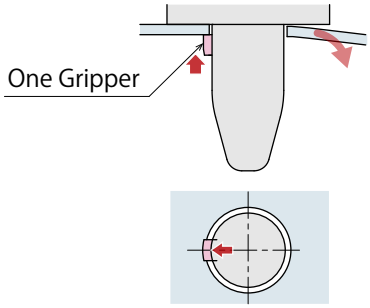


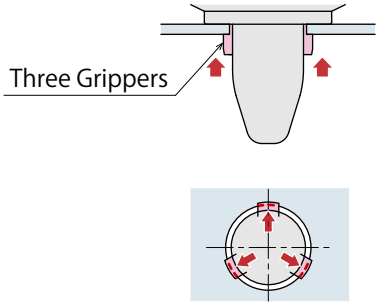
Withstand Distortion of Large Workpiece

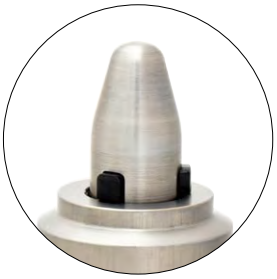
Locating Pin Clamp
Model SWP

Drastically Reduce Damage to Workpiece!!

Clamping a workpiece with one gripper cause a force to concentrate at only one point leading to a workpiece distortion. KOSMEK Locating Pin Clamp reduce such damages by chucking a workpiece hole from the inside, and clamping the workpiece with two or three grippers.



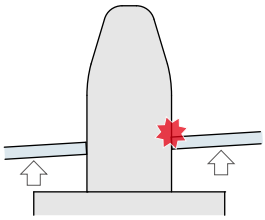




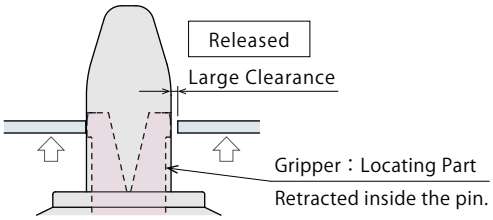
KOSMEK Locating Pin Clamp

Large Clearance for Smooth Loading/Unloading

In case of a general locating pin: A workpiece may be deformed due to welding distortion, causing the workpiece to contact with the guide part and unable to be pulled out. In case of Locating Pin Clamp: Large clearance with gripper expansion/retraction enables smooth workpiece loading and unloading.

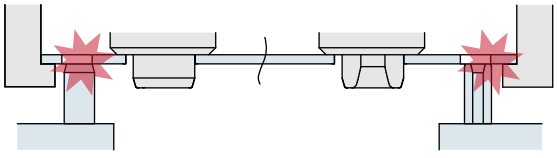


General Locating Pin

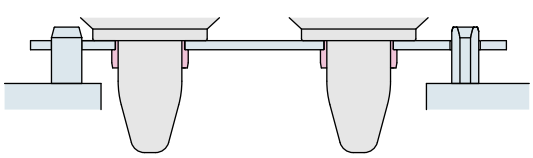


Locating Pin Clamp

High-accuracy locating prevents locating errors when loading.



Loading failure due to workpiece position difference.



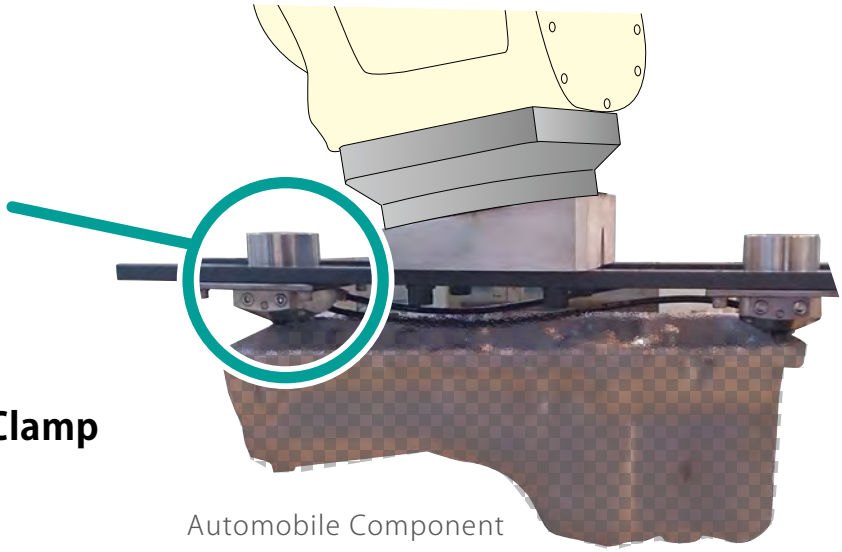
No loading failure possible with high-accuracy locating.

Irregular-Shaped Diecasting Workpiece

High-Power Pneumatic Hole Clamp

Model **SWE**

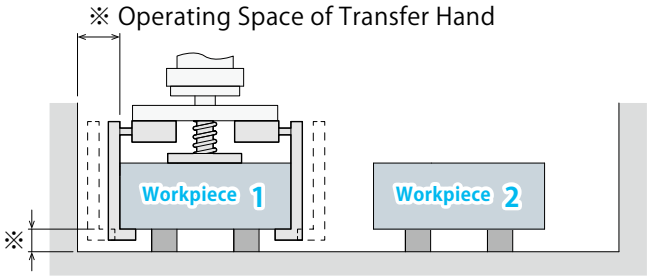
Workpiece Hole Diam.: ϕ6 ~ ϕ13



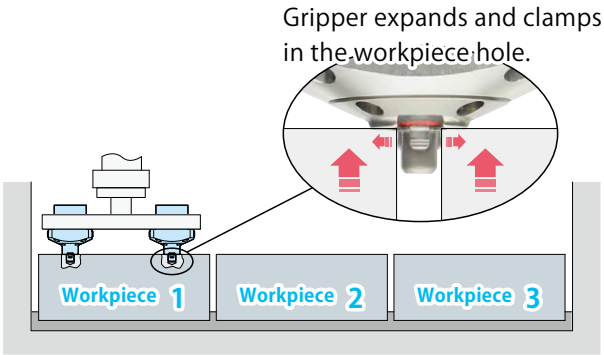
Automobile Component

Saves Space for Storing without Interference around Workpiece

High-Power Pneumatic Hole Clamp to grip a workpiece hole eliminates an operating space for transfer hand, minimizing a storing space for workpieces. Also, an internal spring prevents a workpiece fall even when air pressure drops to 0MPa.



Hand with Linear Cylinders



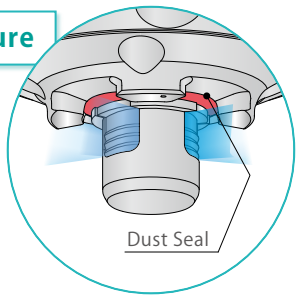
High-Power Pneumatic Hole Clamp

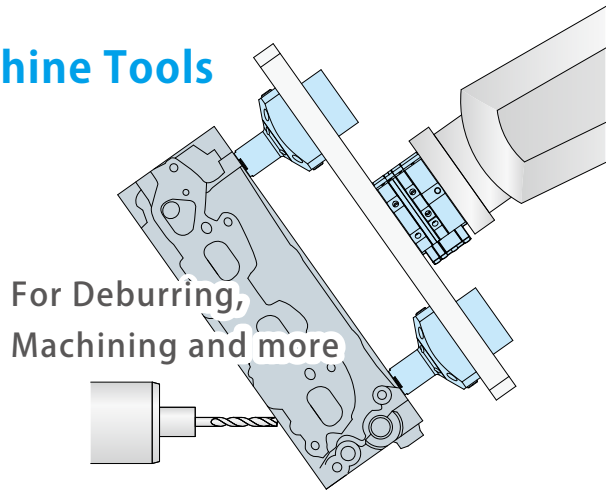
Protective Structure to be Used in Machine Tools

High-Power Pneumatic Hole Clamp (model SWE) is designed to clamp a workpiece in a machine tool with protective structure to prevent contaminants from entering in the cylinder.

Air Blow and Protective Structure

Air blow function and dust seal prevent contaminants from entering into the hole clamp.

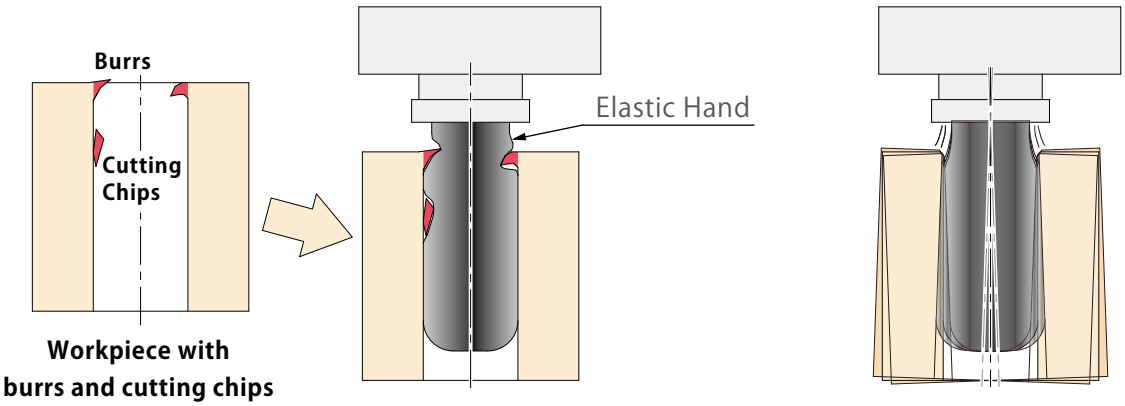




With no interference around a workpiece, a tool is accessible from 5 surfaces

Transfer Machining Parts by Internal Chucking to Reduce Labor and Time for Maintenance

In case of an internal chuck using elastic material



Damage to the Elastic Hand

Easily damaged by burrs and cutting chips leading to frequent maintenance.

Decrease in Transfer Accuracy

Elastic material causes a workpiece to fluctuate during transfer, leading to low locating accuracy.

Expansion Locating Pin

Large Expansion Model

Model VWH

Expansion Stroke is 1.1mm

Tool-Steel-Made Gripper Enables High Durability

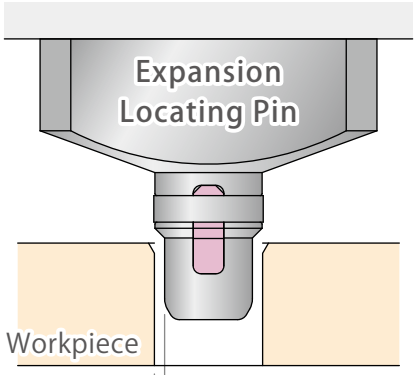
The gripper that contacts a workpiece is made of tool steel and thus has high durability. This drastically reduces frequency of maintenance.

High-Accuracy Locating 10 μm

Gripper expansion enables zero clearance between the pin and a workpiece hole. 10 μm locating repeatability dramatically improves workpiece transfer accuracy.

Expanding Force：70 ~ 250N

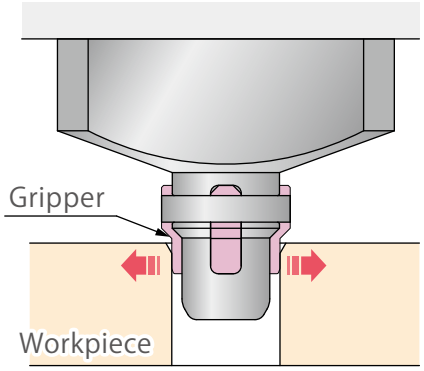
When Loading (Retracted)



Large Clearance

Allows for Usage in Robot Application

When Locating (Expanded)



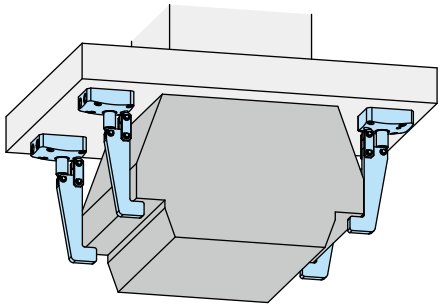
Zero Clearance

High Accuracy without Backlash

Transfer Irregular-Shaped Parts with a Gantry Loader

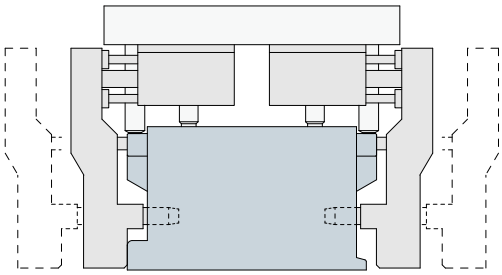
Automobile Component

High-Power Model **WHE/WCE**
Pneumatic Swing/Link Clamp



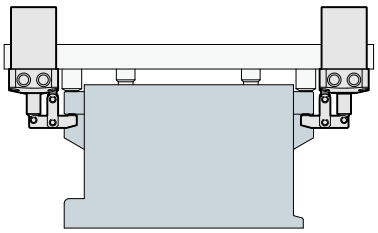
Clamping a Specific Spot, Light and Compact Hand Increases Operating Speed

KOSMEK exclusive built-in mechanical locking enables both compact and high-powered clamp cylinder and thus downsizing a transfer hand.



Hand with Linear Cylinders

Lighter Hand Enables Higher Transfer Speed

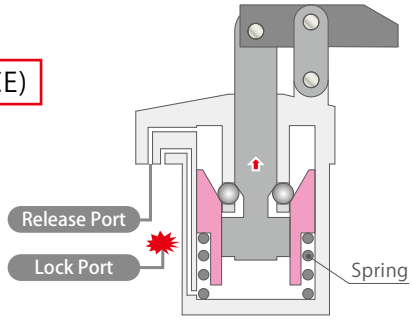


High-Power Clamp

The function only for High-Power Pneumatic Link Clamp (model WCE)

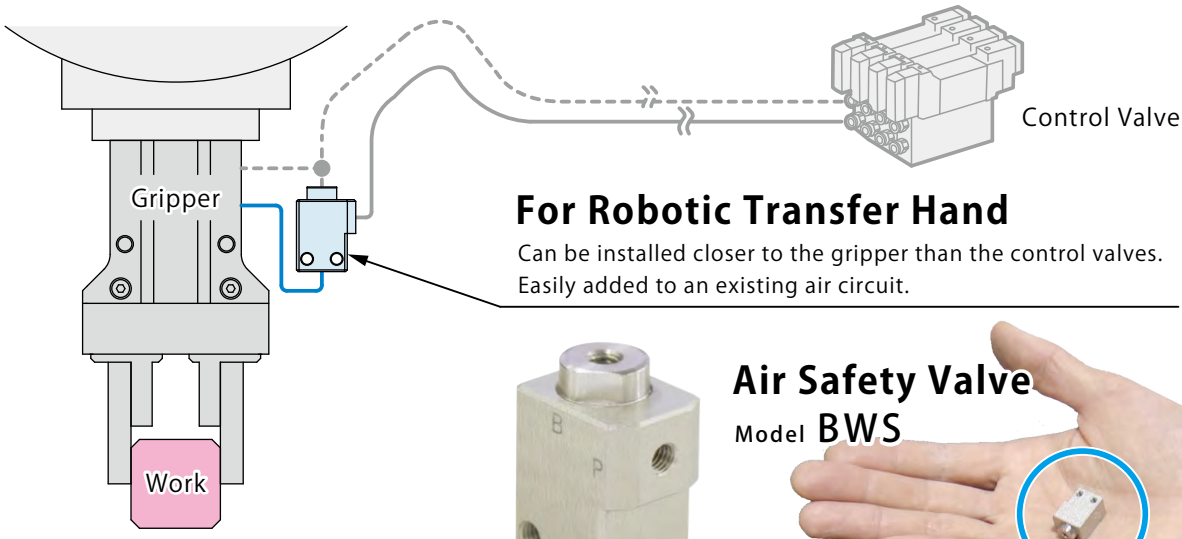
WCE Prevents a Work Fall with Self-Locking

High-Power Pneumatic Link Clamp (model WCE) has built-in self-locking function to maintain clamped state even when air supply is cut off. Installed as a safe transfer hand.



Self-Locking State
(Hold with Spring Force + Mechanical Locking)

Workpiece Fall Prevention to Ensure Safety

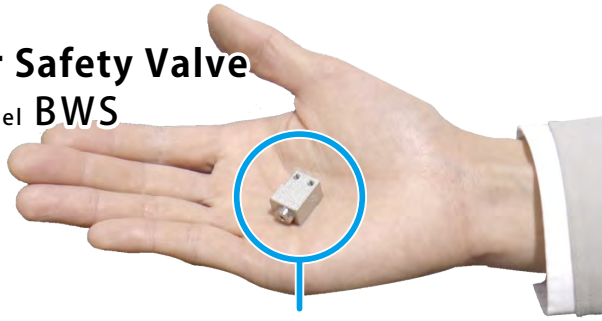


For Robotic Transfer Hand

Can be installed closer to the gripper than the control valves.
Easily added to an existing air circuit.

Air Safety Valve

Model **BWS**



Ultra-Compact and -Light Air Pilot Check Valve
The weight of M3 thread size is 9g, and
M5 thread size is 14g.

Maintains pressure to prevent a workpiece fall even when air supply is cut off.

Air Safety Valve maintains air pressure in a circuit even when air supply is cut off due to power failure or piping damage caused by deterioration of air tube or a lack of consideration to piping design. Prevents a workpiece fall during transfer with a robot, protecting a workpiece and equipment. Built-in sealing is a soft seal with high reliability.

Prevent Errors during Teaching Safety Push Valve

Prevent a Tool Fall of Robotic Hand Changer during Teaching

Able to mount directly on Robotic Hand Changer (model SWR), prevent a tool fall caused by valve operating error during robot teaching. Enables to limit the SWR to release only at a designated position (tool stocker).

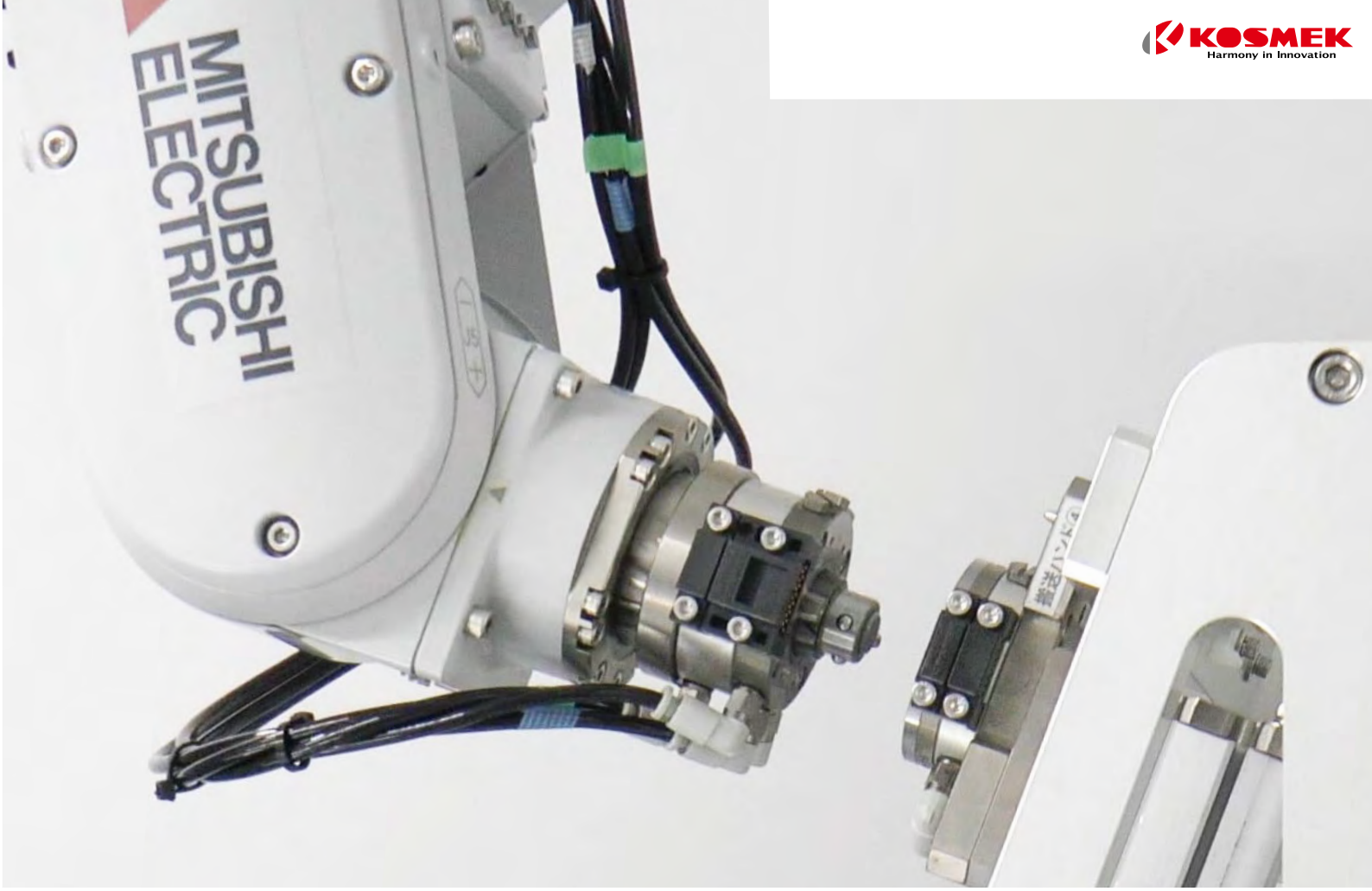
model **SWRA0M0**

model **SWRA0A0**

Automation

Setup

Automating a single operation is not sufficient to meet requirements from customers. Robots and applications need the ability to perform multiple operations.
KOSMEK provides safe automation products that enable unattended setup of robotic hands, fixtures and pallets.


MITSUBISHI
ELECTRIC


NACHI

Automation with Robot

Setup of Robotic Hand

Best-Seller Model **SWR**

The World's First!
Zero-Backlash Robotic Hand Changer

Zero-backlash when connected: High accuracy, high rigidity (strong to bend and twist) and long operational life (durability of 1 million cycles)
Enables one robot to perform multiple operations with setup of robotic hands.

KOSMEK Exclusive
Semi-Permanent Non-Backlash Mechanism

"Repeatability 3 μm" "High Rigidity"
"Applicable to Various Environments"

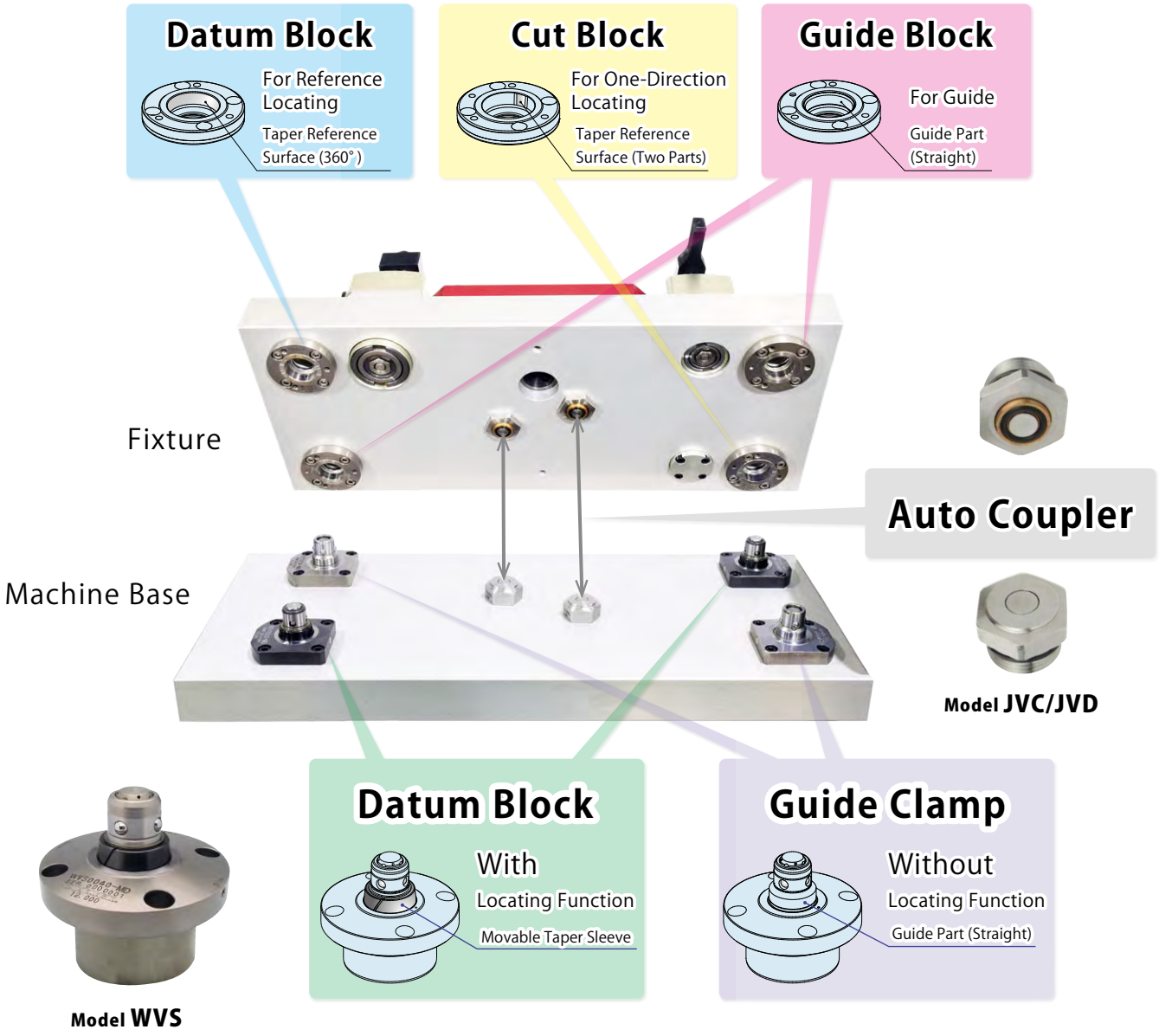
Automation with Robot

Setup of Fixtures/Pallets

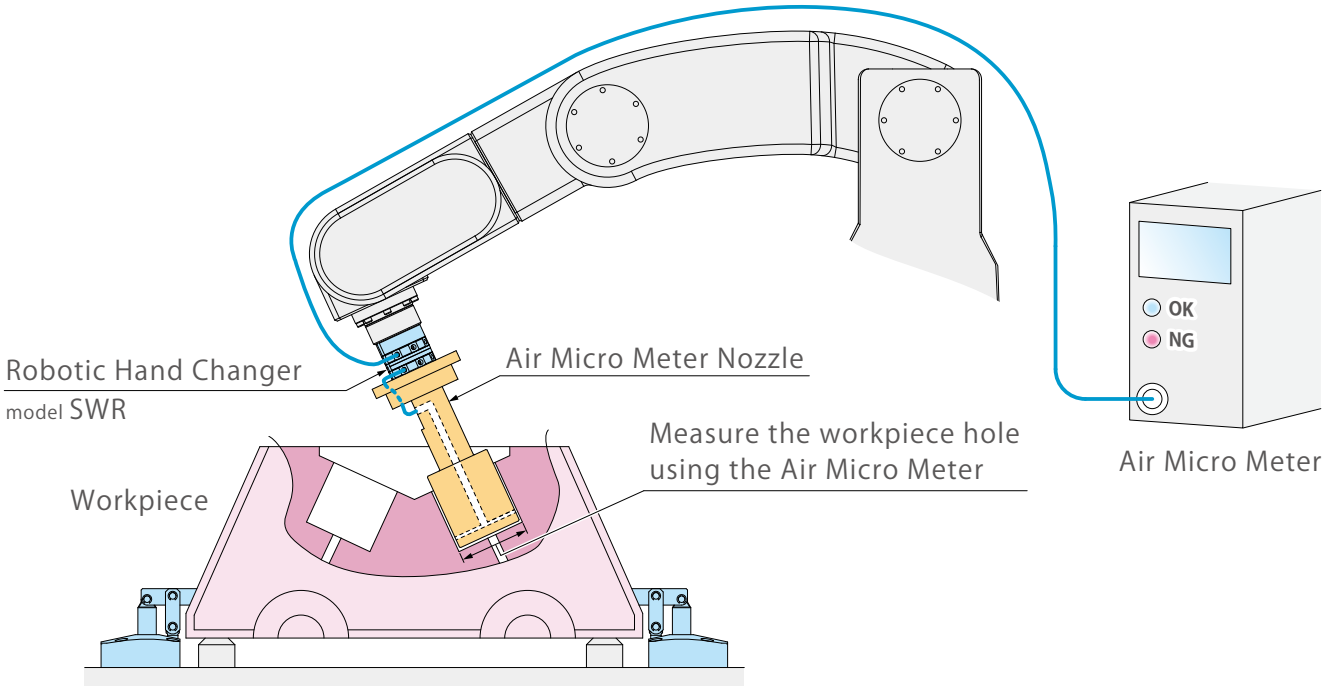
Model **WVS/SWT/SWQ/WVG/VS**

Pallet Clamping System

Pallet Clamp to locate and clamp simultaneously enables both high accuracy and high rigidity.
Reduces setup time of fixtures and pallets, standardizing application with setup.



Dimensional Inspection with Air Micro Meter

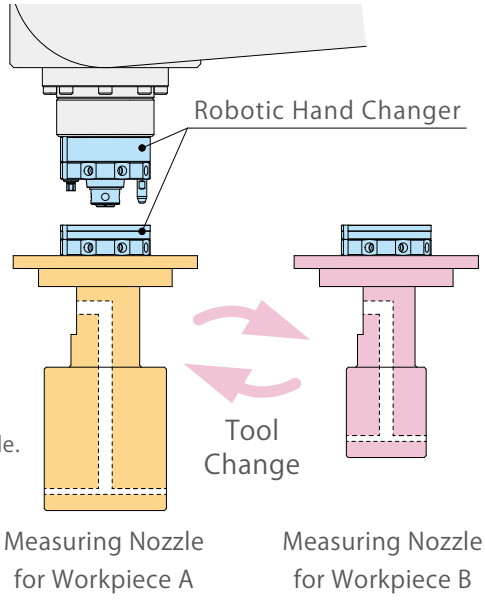


Connecting with 3 μm repeatability,
inspection tool change will have no influence.

Tool change automation enables inspection of various workpieces.

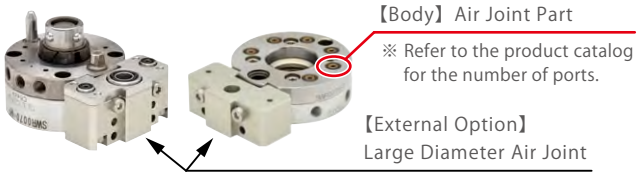
The automatic replacement of the air micro meter nozzle by the robotic hand changer. This results in automating the dimensional measurement of various workpiece holes.

- Able to automate the inspection of multiple workpieces on different device lines.
- When replacing the tools, repeatability is within 3 μm. The robotic hand changer minimizes the positional deviation of the tip, making precise measurement possible.
- Approachable to the workpiece hole with minimum deviation, and to prevent shut-down through damaging tools and measuring nozzles.

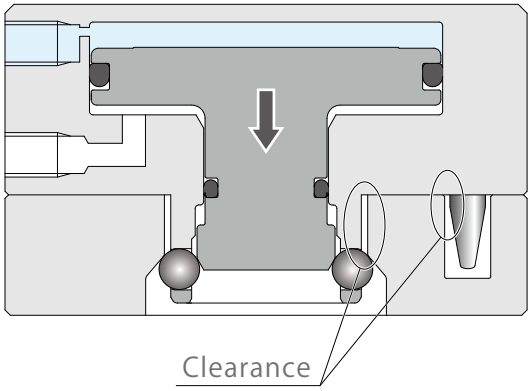


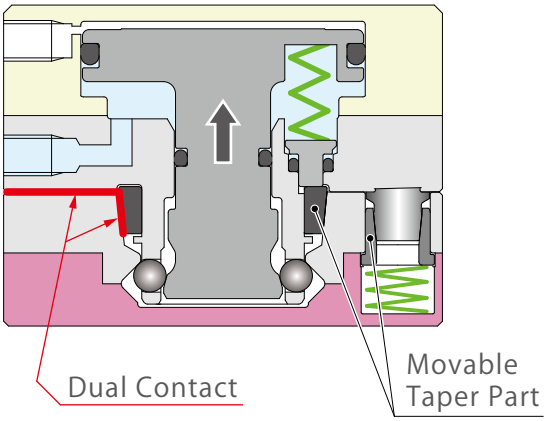
Proper Air Joint and Large Diameter Joint

- The air joint part of the robotic hand changer prevents the air leakage due to sealing by an O-ring, and this makes precise measurement possible by the steady air supply.
- Able to add large diameter joint (Port diameter: φ6) if air flow rate is insufficient through main body port.



Helical Gear Assembly with Force Sensor





General
Tool Changer

KOSMEK
Robotic Hand Changer

KOSMEK Robotic Hand Changer is highly rigid with no clearance in any directions due to dual contact that the movable tapered surface and the seating surface contact all the time.

Send an accurate load to the force sensor, correct properly to eliminate operation stops.

To the load of twist and bend, the non-clearance robotic hand changer has no backlash, sending an accurate load to the force sensor and thus the robot is able to correct misalignment properly.

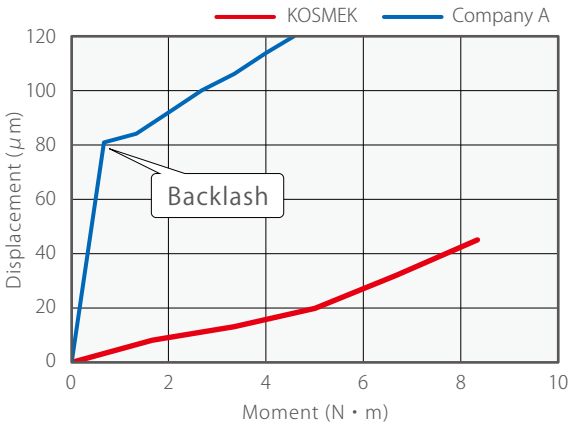
Changing from Grease-Applying Tool to Integrate Processes

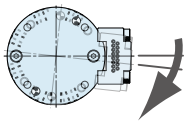
Changing Transfer Hand and Turning Tool

Tool Change from transfer hand to screw tightening tool and deburring tool with high rigidity

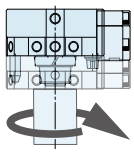
Model **SWR**
Robotic Hand Changer

Moment and Displacement ※Equivalent to 5kg Payload

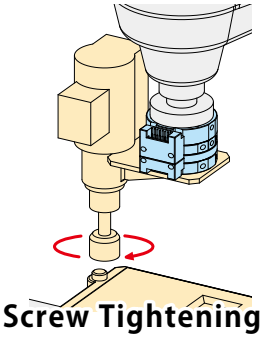




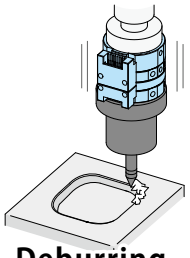
Displacement



Twisting Moment



Screw Tightening



Deburring

Dual Contact Connection to Withstand Impact Load

Process Integration Possible by Changing Tool to Transfer Tool and/or Different-Sized Tool

Compact Electric Power Transmission Electrode
Able to Send AC/DC200V 5A

Large Diameter Air Joint
Suitable for Negative Pressure

A Variety of Options Available for Electric and Pneumatic Tools

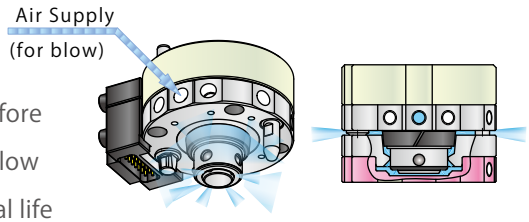
Cutting Machine Automation with Robot

Secure automation in an environment with coolant and cutting chips

Model SWR
Robotic Hand Changer

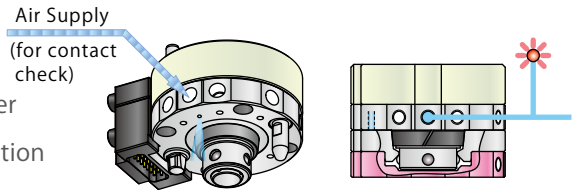
Air Blow Function※

The taper reference surface and the seating surface to ensure high accuracy bring adequate clearance before connection to perform an effective air blow. The air blow prevents contamination, leading to longer operational life of SWR.



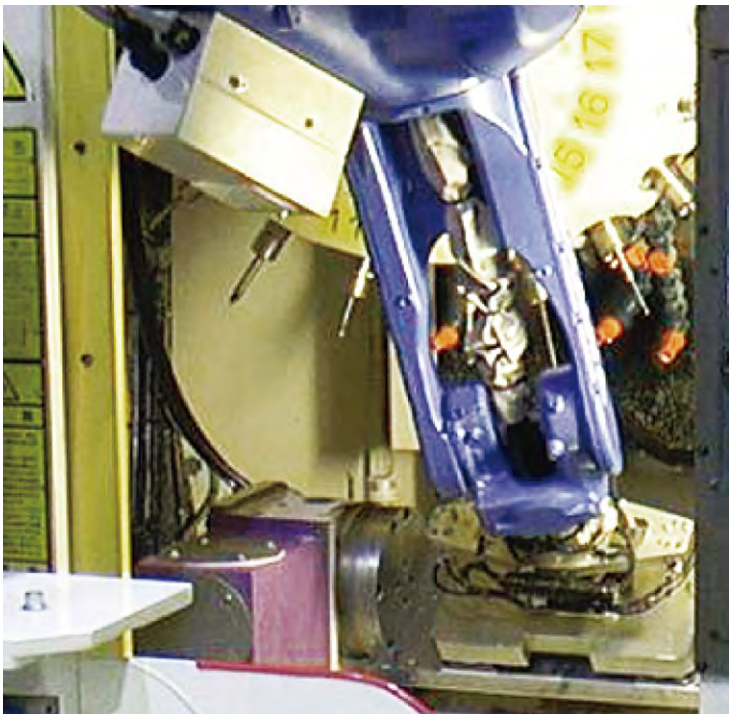
Contact Check Function※

The contact check of master cylinder and tool adapter detects the connection precisely, preventing connection failure of robotic hand changer beforehand.



※ Installation of the air blow function and the contact check function varies depending on options. Please refer to the product catalog for details.

Robotic hand changer is equipped with the technology acquired in cutting machine process of automobile industry.

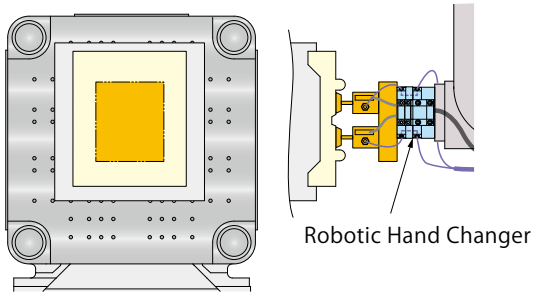


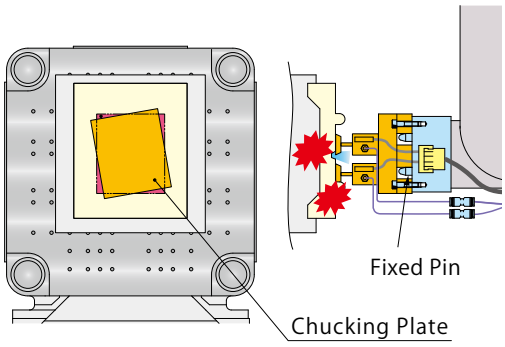
Noncontact Waterproof Electrode
Applicable to IP67
Safe in Cutting Fluid (Coolant) Environment

Used in a lot of productions of automobile industry.

Hand Change of Take-Out Robot of IMM

Model SWR
Robotic Hand Changer





No Backlash

KOSMEK Robotic Hand Changer

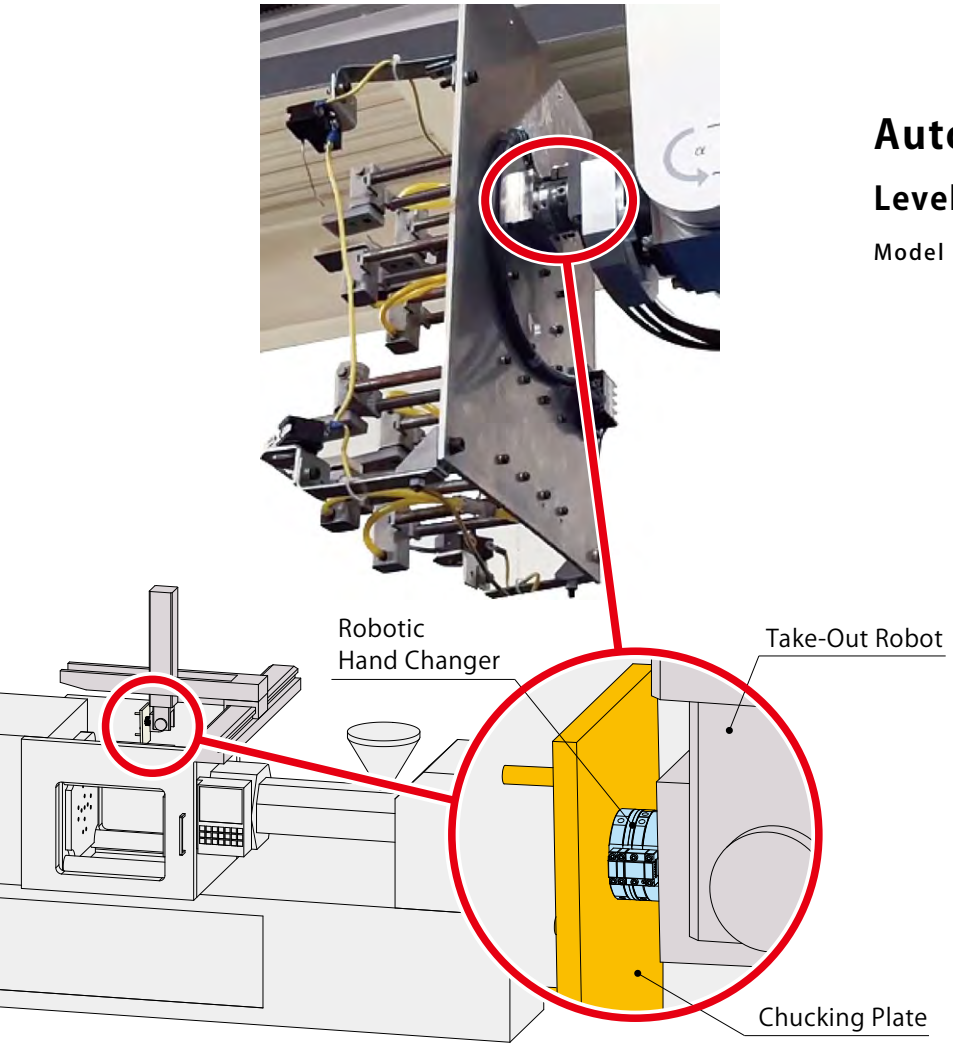
- 3 μm repeatability prevents chucking errors caused by backlash.
- Automation ensures safety. No changing errors of chucking plates.
- Also applicable to automatic gate cutting.

Backlash

General Locating Pin

- Repeatability depends on the locating pin. Backlash causes chucking errors.
- Chucking plate is heavy. Changing work is dangerous.

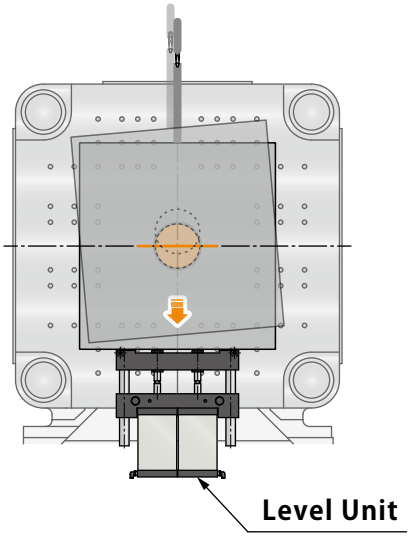
High-accuracy connection ensures inserting to an aimed position.



Automatic Leveling

Level Unit

Model MHL

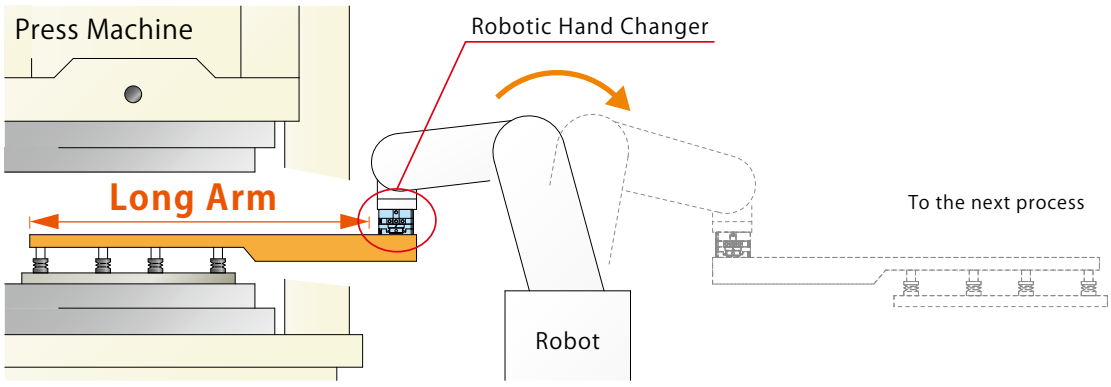


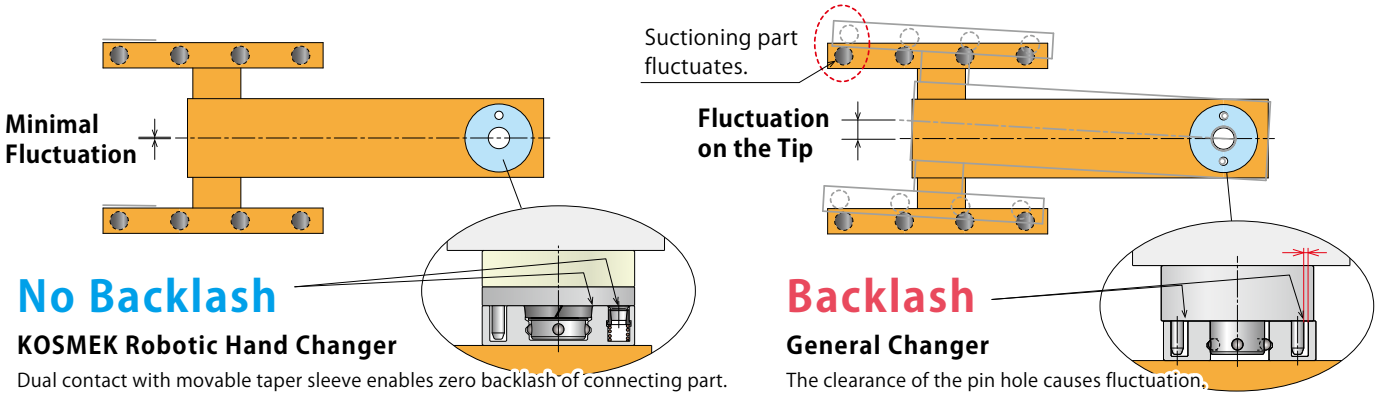
Leveling is completed just by placing a mold on Level Unit with a crane.

Reduce the Fluctuation of Longer Arm

Hand Change of Press-to-Press Transfer Robot

Model SWR
Robotic Hand Changer





No Backlash

KOSMEK Robotic Hand Changer

Dual contact with movable taper sleeve enables zero backlash of connecting part.

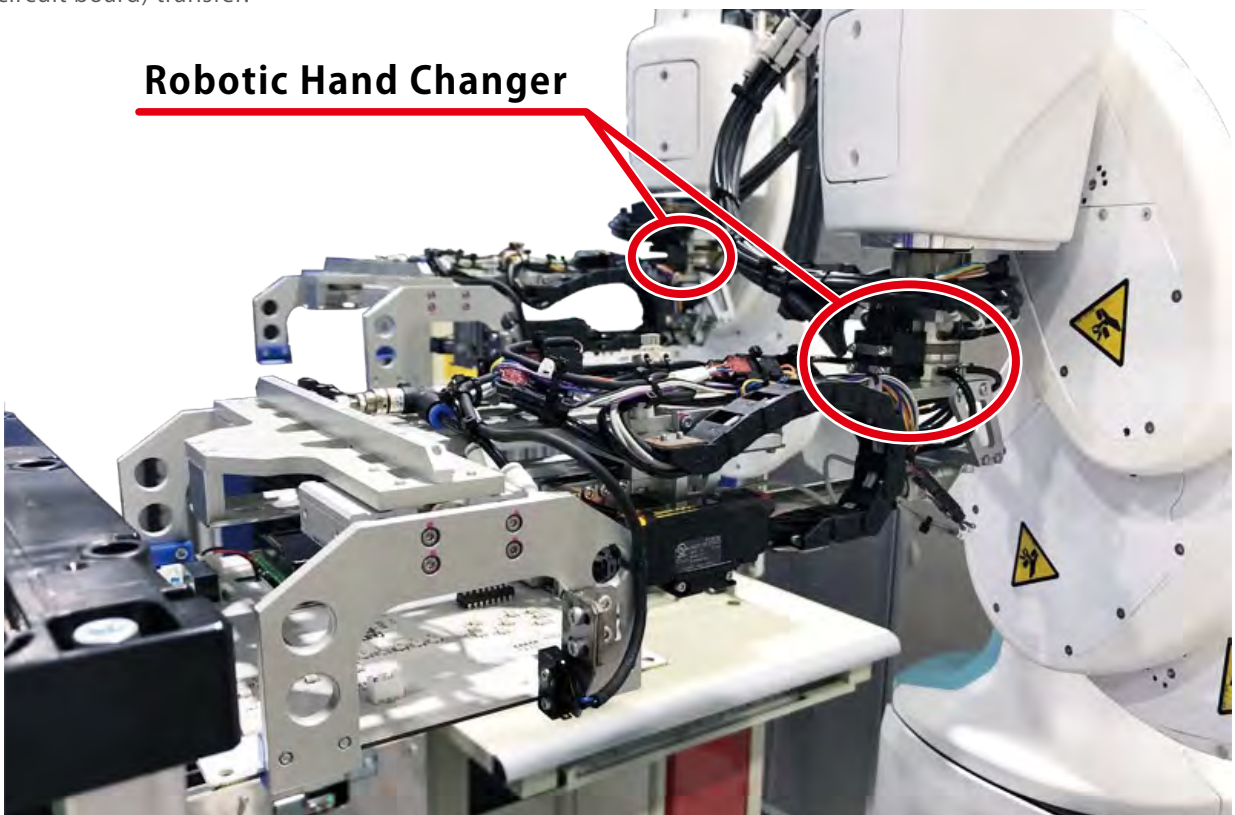
Backlash

General Changer

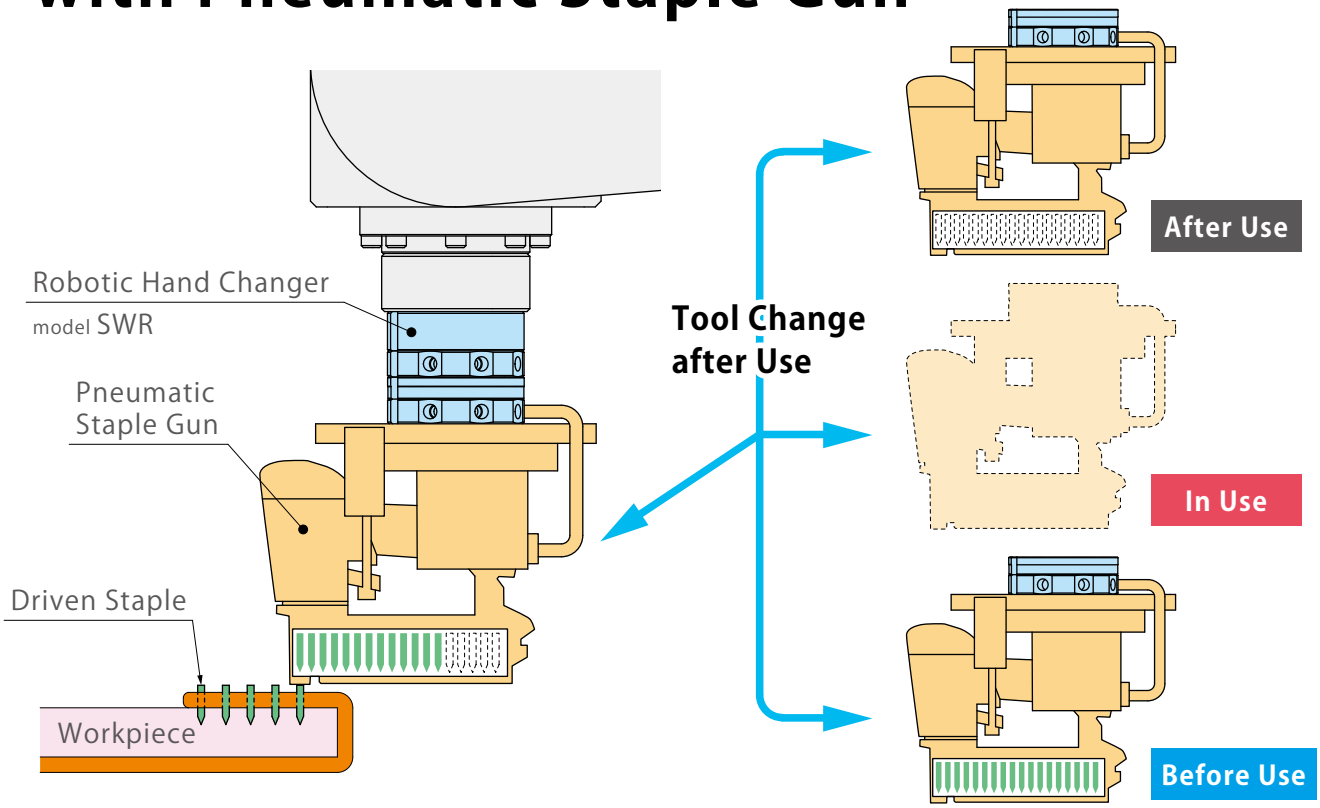
The clearance of the pin hole causes fluctuation.

Hand Change of Transfer Long Arm for Inspection Process of Dual-Armed Robot

Zero-backlash robotic hand changer ensures minimum fluctuation on the arm tip and thus accurate workpiece (circuit board) transfer.



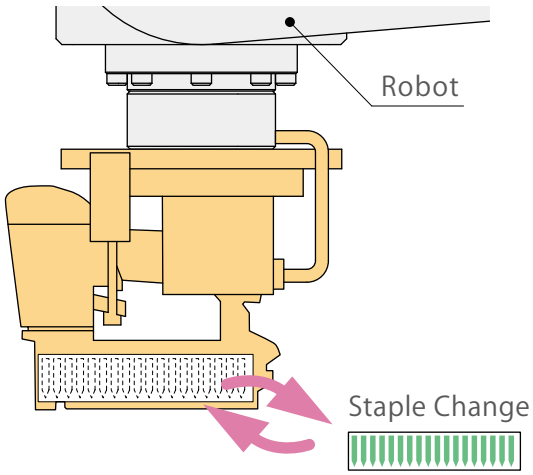
Productivity Improvement for Stapling with Pneumatic Staple Gun

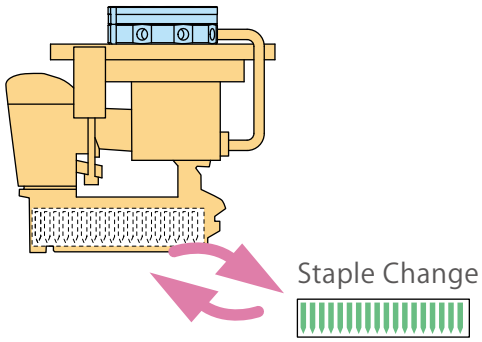


Multiple Pneumatic Staple Guns on a Stocker

Dual contact of SWR withstands impact load of staple gun
Setup of Refill Stapler Improves Productivity

Automatic stapling with a robot and multiple pneumatic staple guns by changing tools that are prepared beforehand (setup outside) allows the robot to maintain production without stopping to refill staples. This improves productivity. 3 μm repeatability during tool change enables to drive a staple into a precise position.





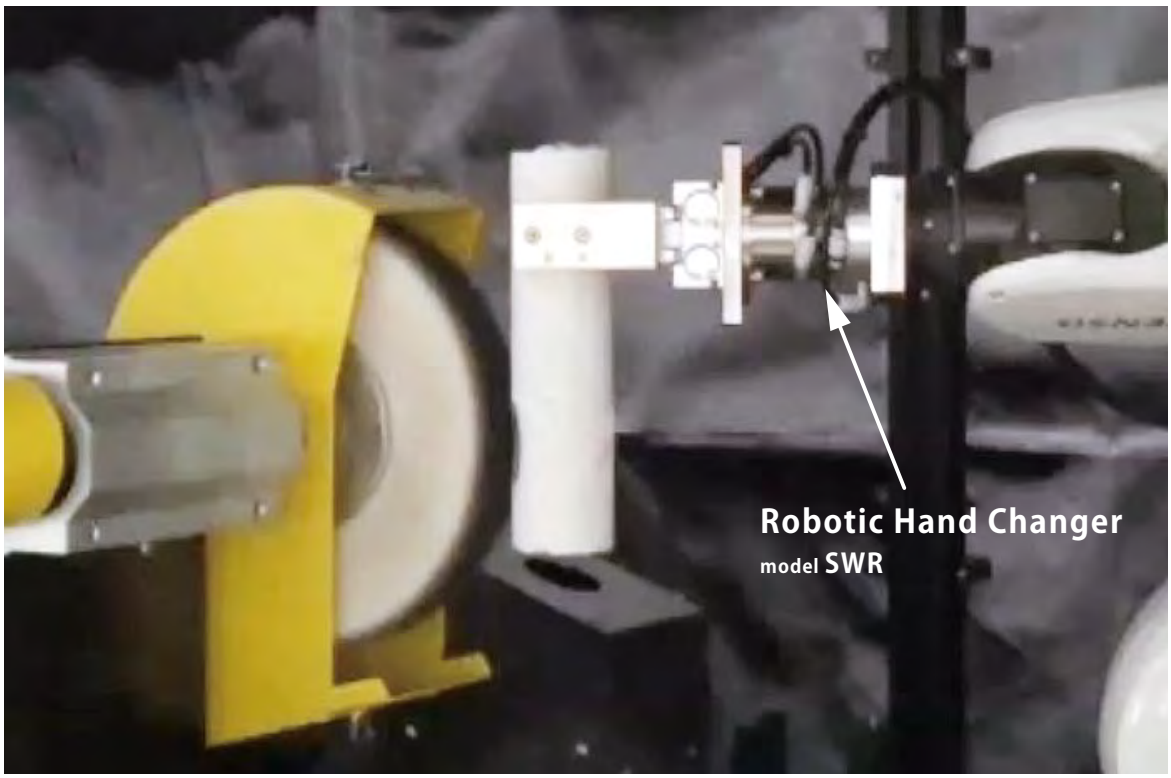
Refilling Each Time : Dangerous

Requires operators to refill staples, leading to unsteady production. Also it is dangerous because an operator needs to approach to the robot during refilling.

Refilling Beforehand : Safe

Able to prepare a certain amount of staples beforehand and change tools when refilling staples, ensuring steady and safe production.

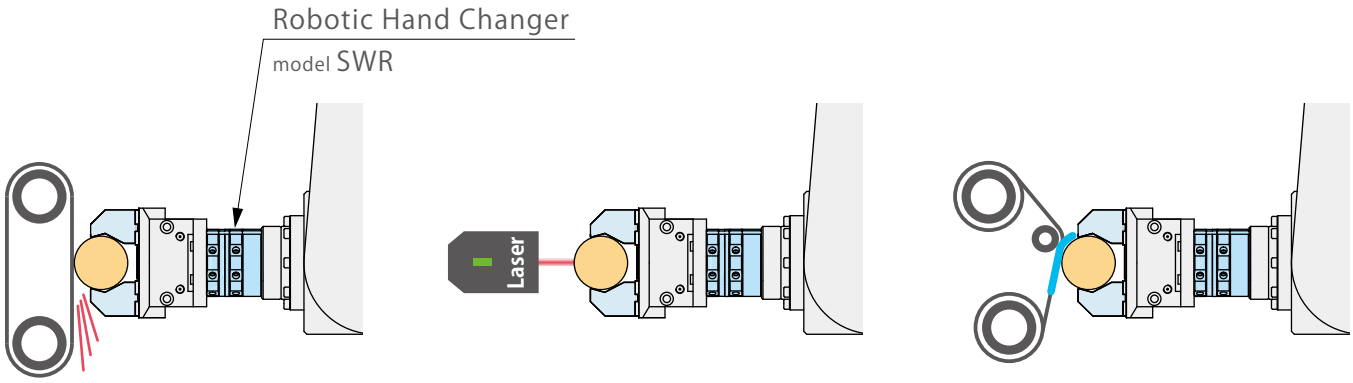
Changing Robotic Hands to Hold Irregular-Shaped Workpieces



Zero-backlash robotic hand changer is strong to load and keeps fine appearance of products.

The robotic hand changer is able to hold a workpiece without backlash even when a bend or twist load is applied. This improves quality of products and reduces defect rate of products.

Repeatability is 3 μm so workpieces can be transferred to the same place every time, enabling the robot to apply polishing, laser marking and other processing to a specific spot.

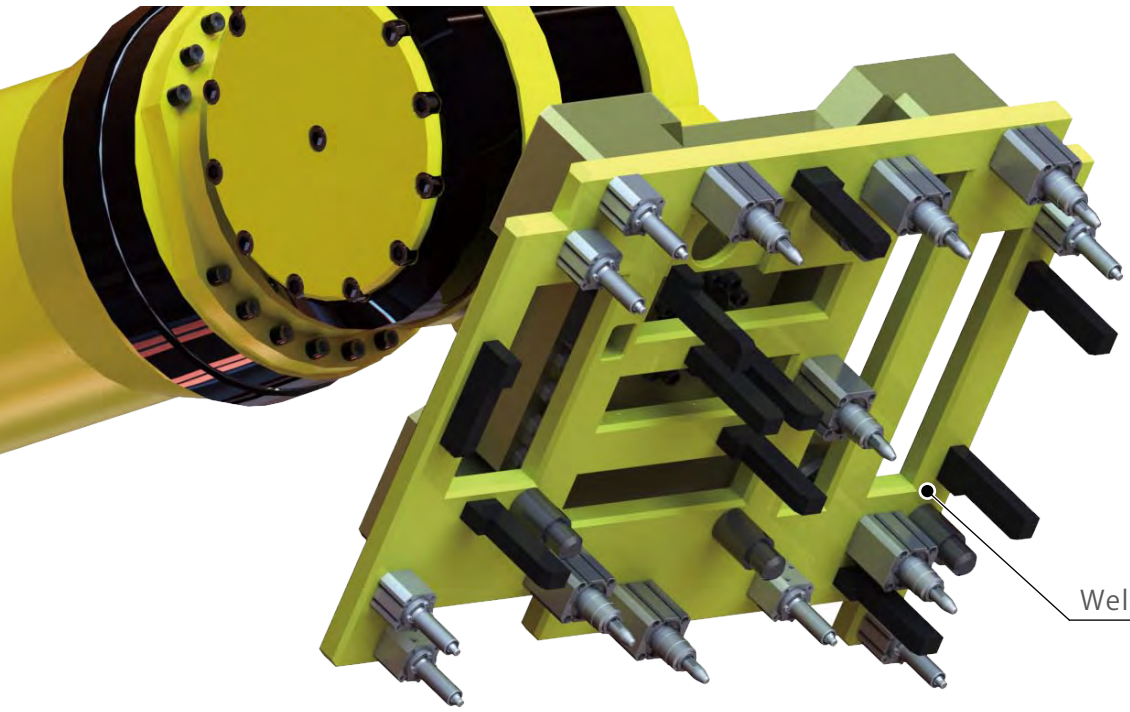


Bead Polishing
Buff Polishing

Laser Marking
Printing

Labeling

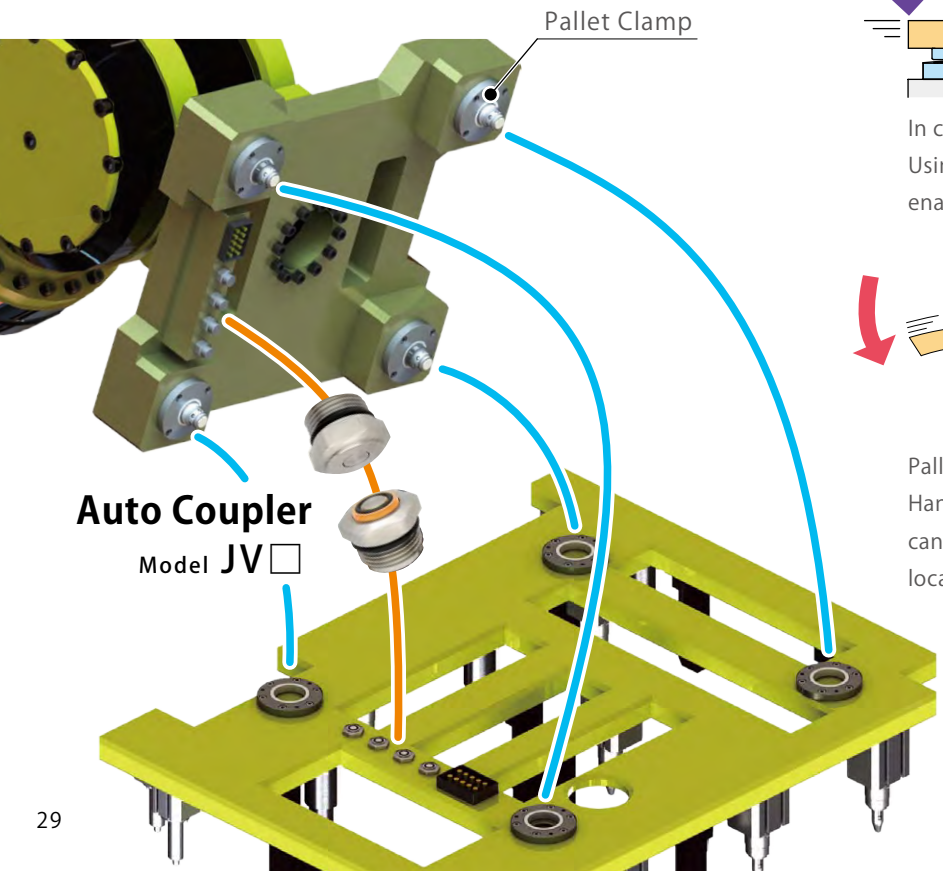
Welding Fixture • Pallet Change

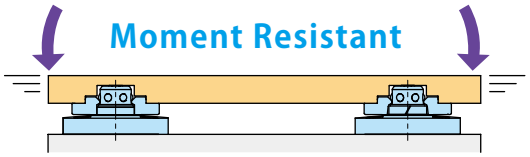


High-Power Pallet Clamp
Model **WVS**

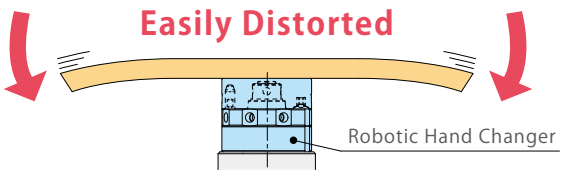
Pallet Change and High-Accuracy Locating of a Positioner with a Robot for Standardization of Equipment

Multiple workpieces can be used in this application by changing welding fixtures with Pallet Clamp. Pallet Clamp (model WVS) with 3 μm locating repeatability enables high-accuracy pallet change and setup time reduction.





In case a pallet can be distorted due to its size : Using multiple pallet clamps in an application enables to withstand moment.

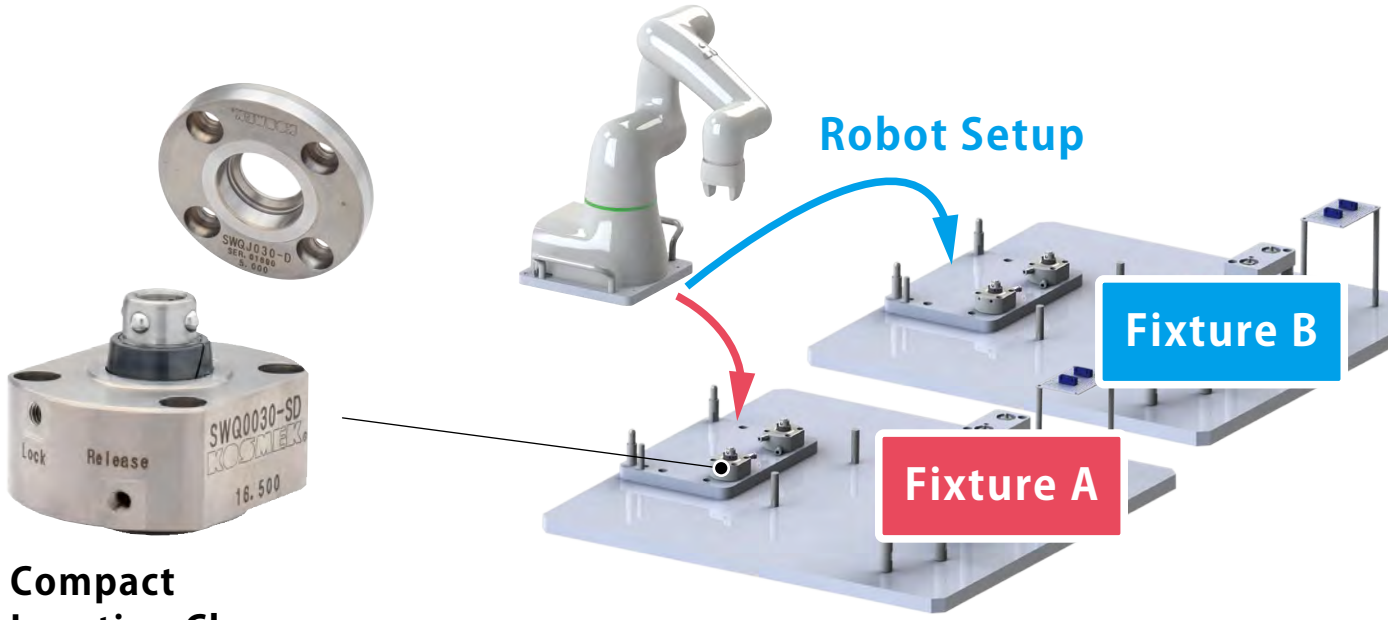


Pallet can be easily distorted in case of Robotic Hand Changer : Only single robotic hand changer can be installed to a pallet, because it completes locating of a pallet with one device.

Sharing Compact • Collaborative Robot

No Re-Teaching Required Even After Re-Setting the Robot

Location Clamp (model SWQ/SWT) with 3 μm locating repeatability requires no re-teaching or misalignment correcting of the robot when the robot is changed between applications. Anyone can setup the robot.



Compact Location Clamp

Model **SWQ**

A single robot can be used for both "Fixture A" and "Fixture B" that have different operations. Transfer and set up the robot to generalize operations.

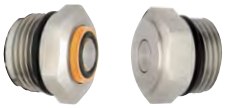
Connect Robot to a Transfer Cart or an AGV with Mechanical Lock

High Repeatability
Re-Positioning Not Required
Automatic Connection

High-Accuracy Locating
Eliminates Misalignment Correcting of a Robot

Robotic
Hand Changer
model SWR

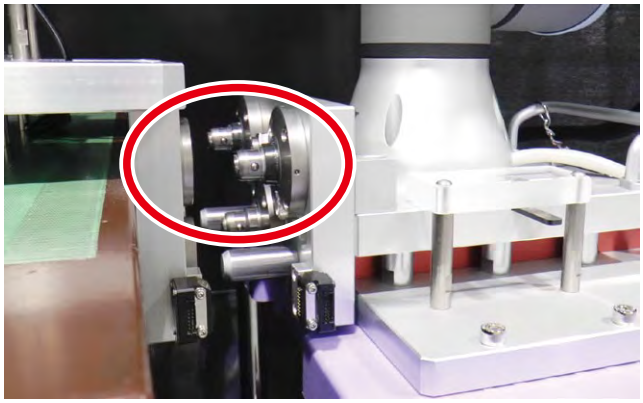
Location Clamp
model SWT



Leakless Coupler
model JWC/JWD

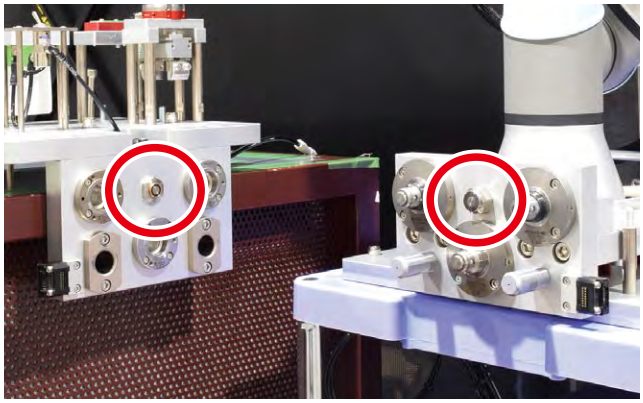
Pneumatic
Free Roller Lifter
model RQC

High-Power
Pneumatic
Work Support
model WNC



High-accuracy locating enables secure repeatability. User friendly. No correcting software required.

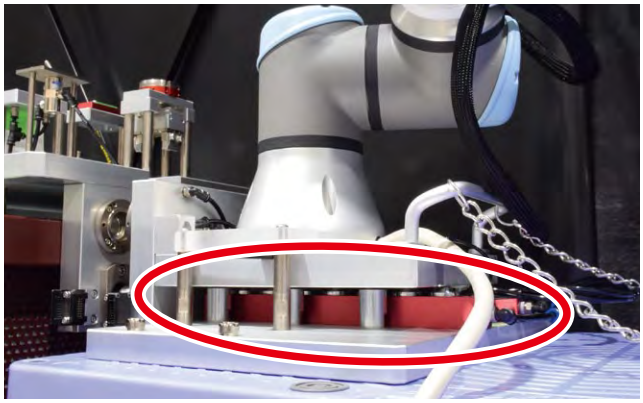
Locating repeatability is 3 μm in a connected state by using Location Clamp or Pallet Clamp (model SWT/WVS). Able to connect the work station with the robot on the pallet with high accuracy, this demo does not require re-positioning of the robot with a camera or software, reducing time or device for correcting. Mechanical locking connection enables a user-friendly application.



Pressure Maintaining Coupler to Use Air Pressure even when Disconnected

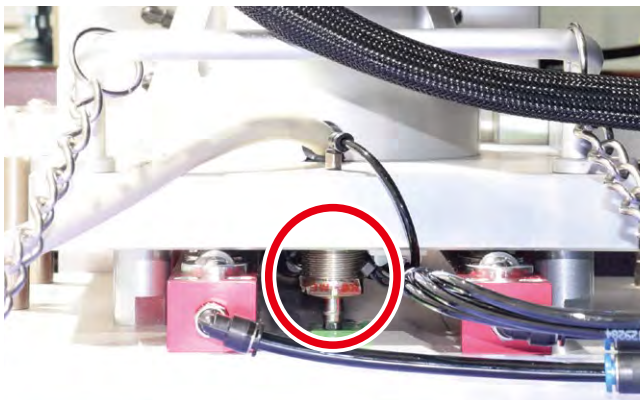
Provide air pressure to the air tank from the air source installed to the work station via Leakless Coupler (model JWC/JWD). When the work station is disconnected from the cart, the station can be transferred with Leakless Coupler maintaining the pressure and the tank filled with air. Therefore, the cart is able to connect to another work station without detection or approach from the station side.

※ Make sure to operate after testing, because air pressure can be released from circuits other than the circuit of Leakless Coupler.



Flexible and easy connection by lifting the robot with Free Roller Lifter. Positioning error of the cart is corrected when loading pallets.

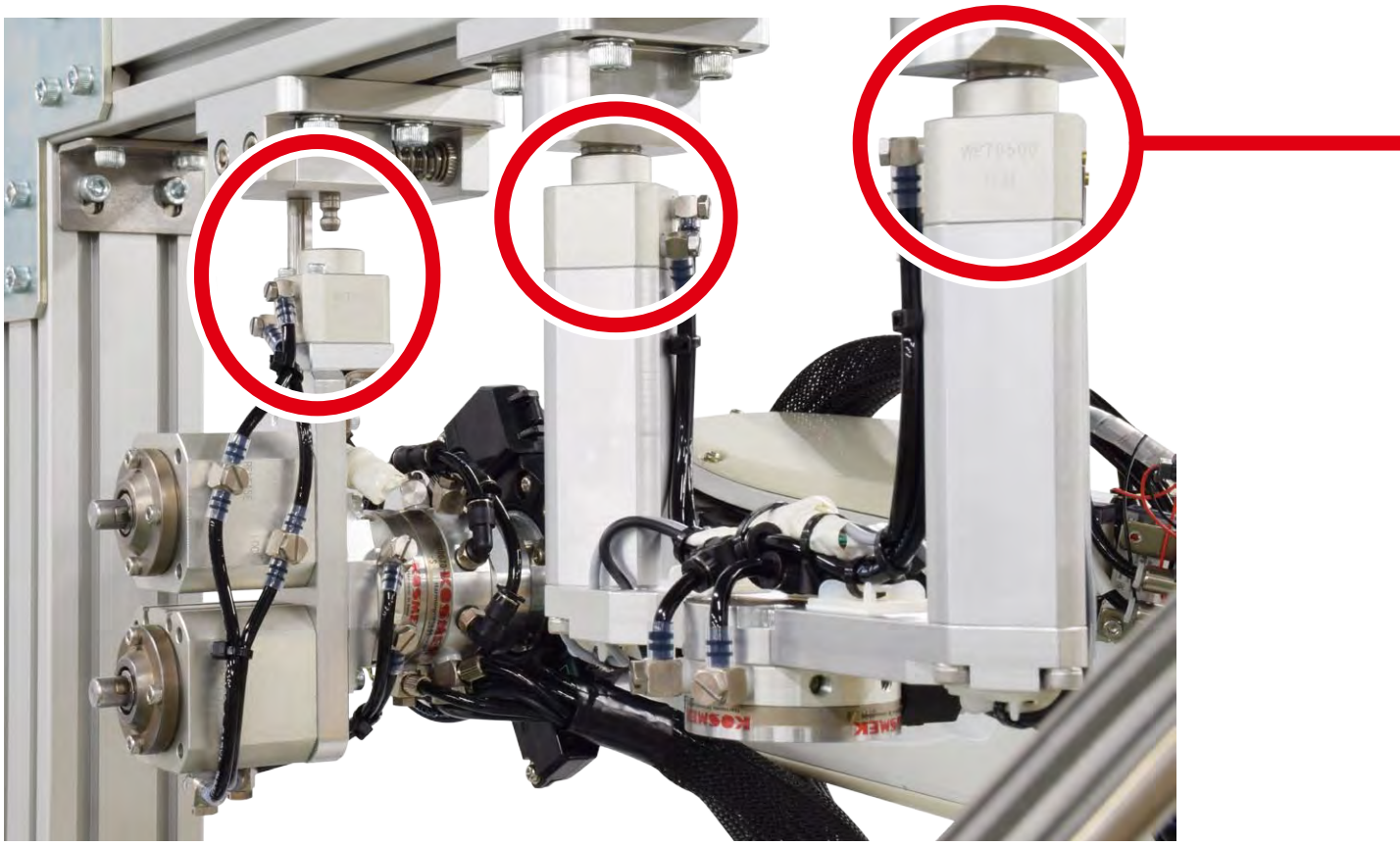
Pneumatic Free Roller Lifter (model RQC) lifts an object with pneumatic force so the object can be moved with light force. Positioning error of a transfer cart or AGV when reached to the work station can be corrected by moving the pallet with the robot on Free Roller Lifter. This enables manual connection or automatic connection with a guide or cylinder.



Powerful Support Underneath Work Support stops at contact.

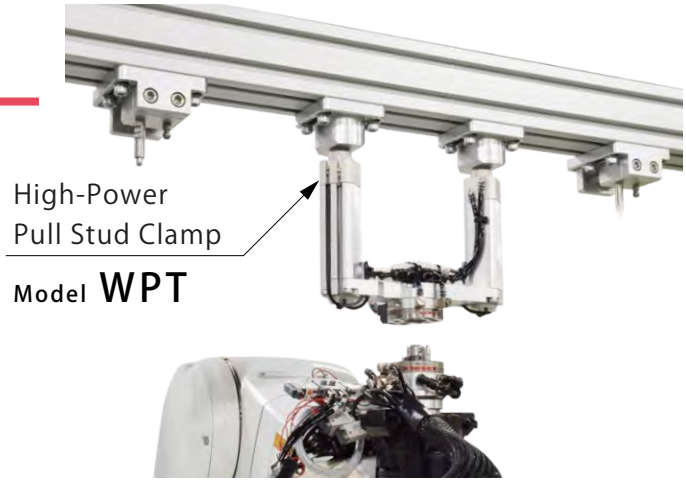
After air supply, the plunger of Work Support (model WNC) strokes and stops to hold when it touches a workpiece. In other words, it allows variation in gaps and holds the workpiece without applying a load. In this demo, Work Support is installed in the rear of the pallet with the robot. Work Support activates after connection to support the pallet and to reduce moment applied to the station.

Saving Space for Tool Stocker

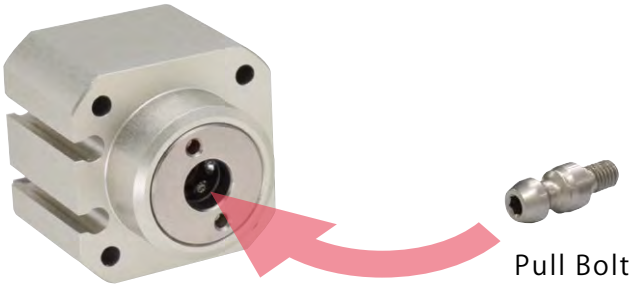


High-Power Pull-Stud Clamp holds a tool on a tool stocker and stays locked even after air pressure is cut off.

Saving valuable space by setting the tool stocker part above the equipment. Self-locking function of Pull-Stud Clamp enables to hold a tool with holding force powered by built-in spring even after detaching the tool. High-Power Pull Stud Clamp makes a stocker safe and simple.

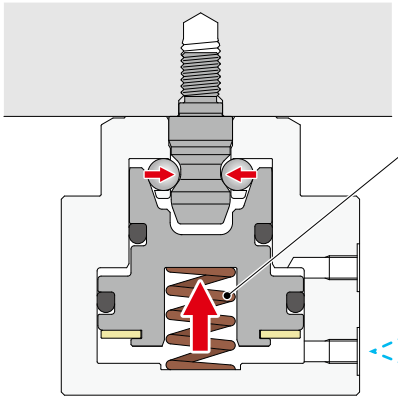


Self-locking function enables to hold the tool on the stocker when air supply is turned OFF.



Pull-Stud Clamp Model WPT

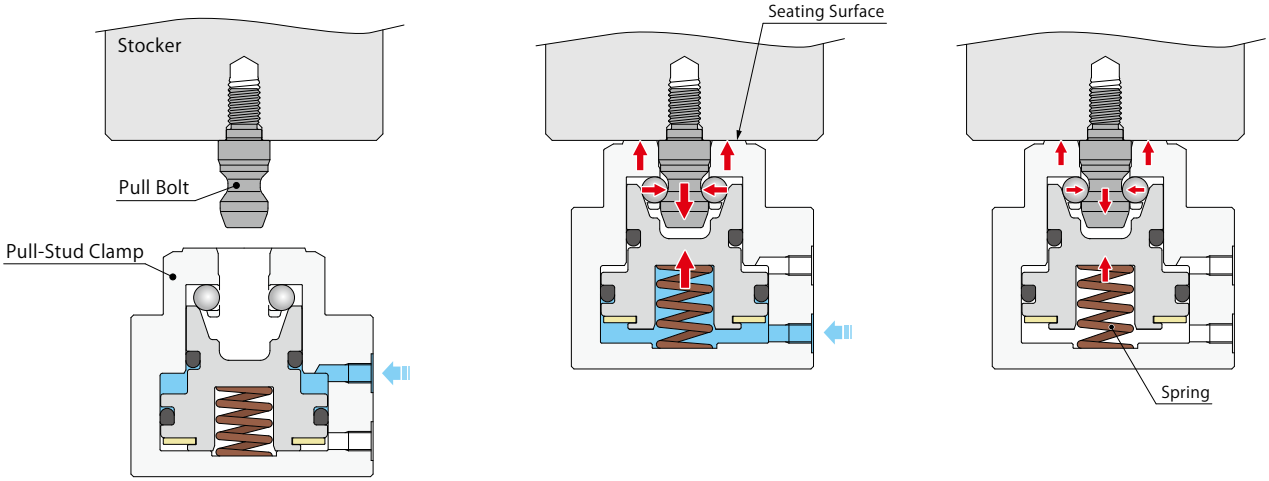
Self-locking function enables to hold the tool with holding force powered by a spring even after detaching a robotic hand tool.



Safe Self-Locking Spring

Self-locking spring enables to hold workpieces even when air pressure is accidentally cut off and drops to 0MPa.

In this application example, air supply to the high-power pull-stud clamp becomes 0MPa after tool change.



Detached State (Released State)

Release Air Pressure：ON
Lock Air Pressure：OFF

Locked state is released by the release air pressure, and the pull bolt can be pulled in and out.

Connected State (Locked State)

Release Air Pressure：OFF
Lock Air Pressure：ON

The pistion and steel balls are moved by the locking air + spring force. The cylinder will be in contact with the seating surface and locked.

Air Supply OFF

Release Air Pressure：OFF
Lock Air Pressure：OFF

The spring force maintains locked state.
※ Make sure the clamp is in a locked state before stopping air supply.

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