

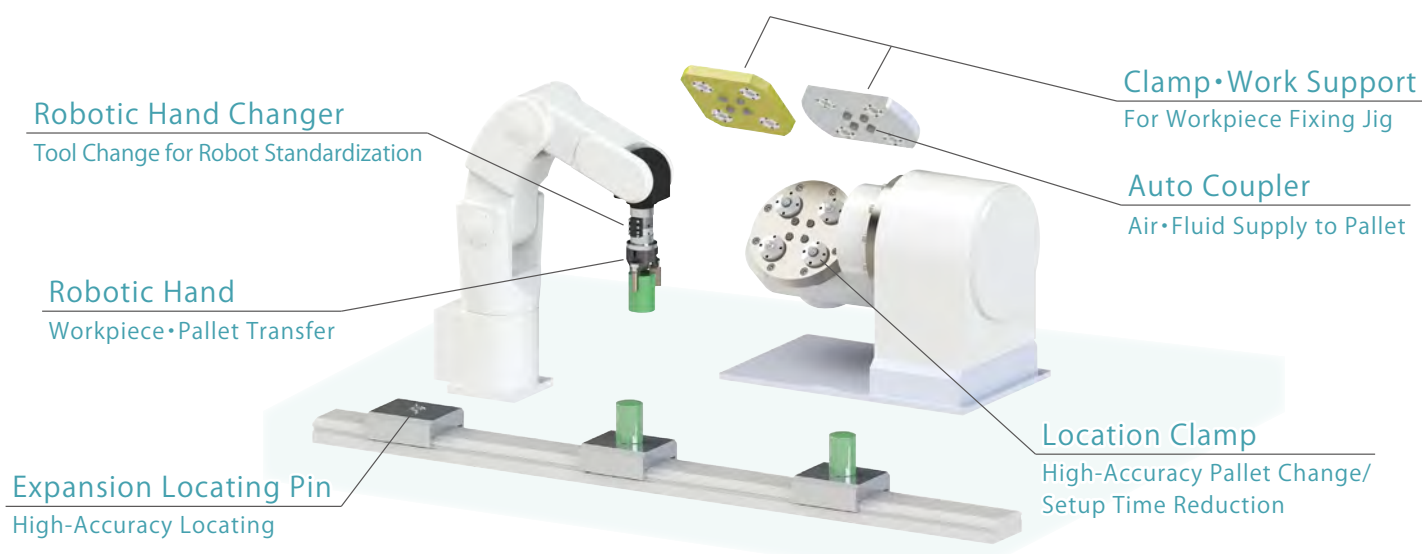
FA • Robotic Automation Products

Application Examples

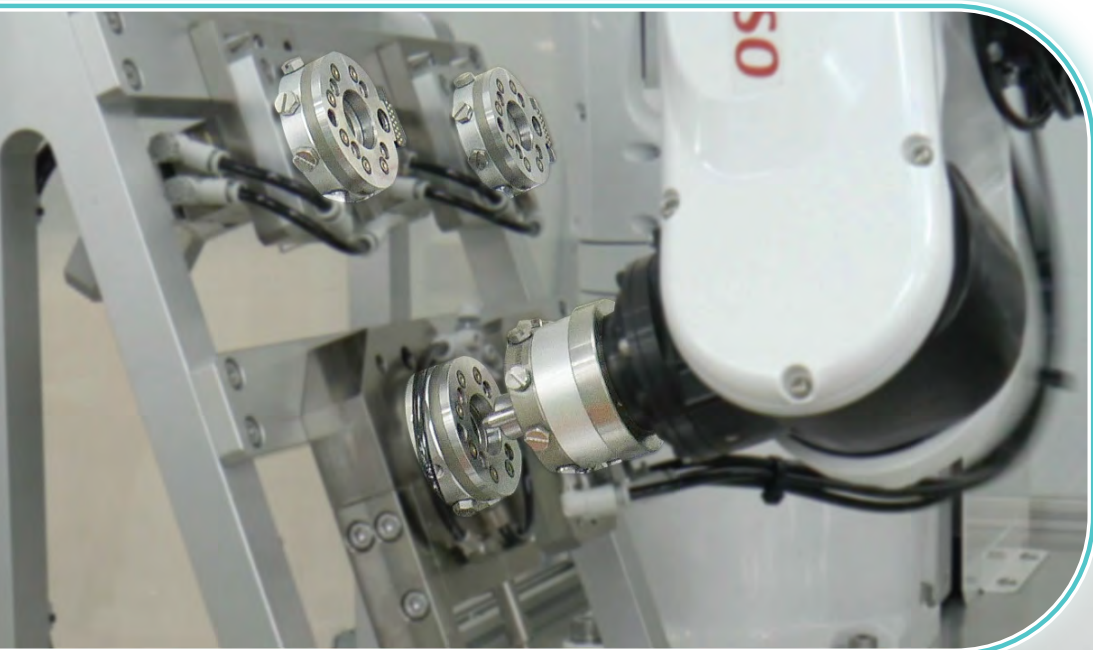
Ver.2

For More Automation Solutions

Kosmek Products for Automation and Setup Improvement in Every Process

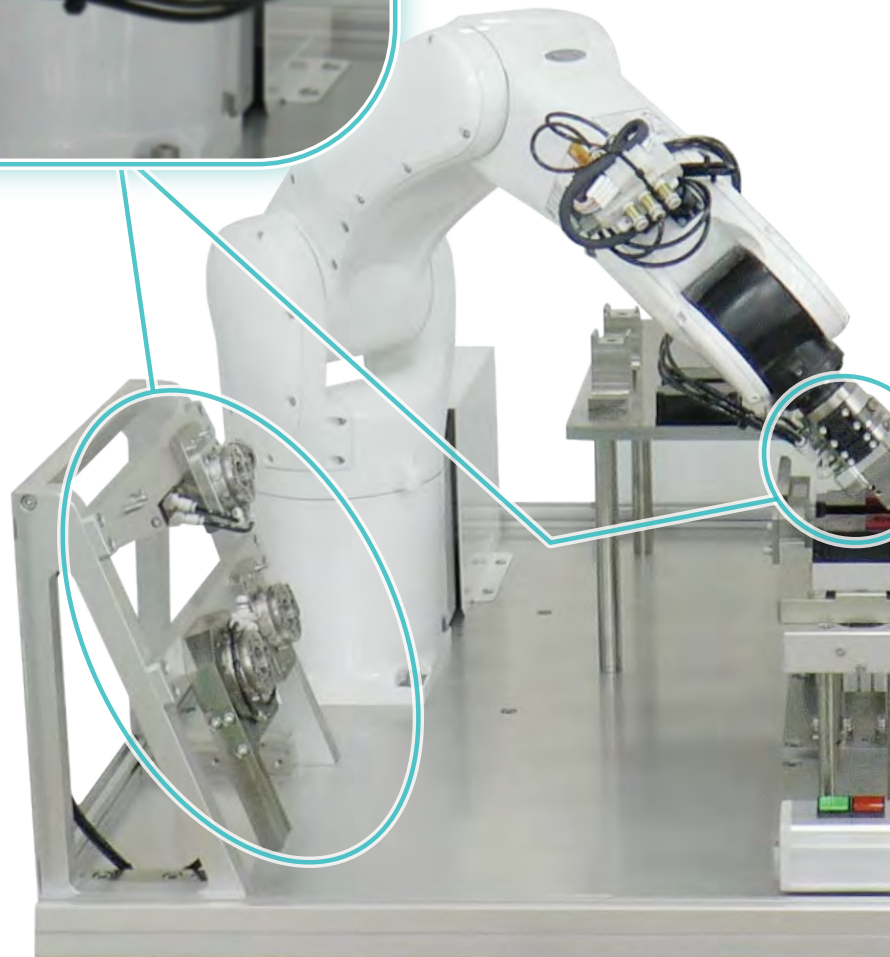


Tool Change



Robotic Hand Changer

P.3



Locating

Automation Products

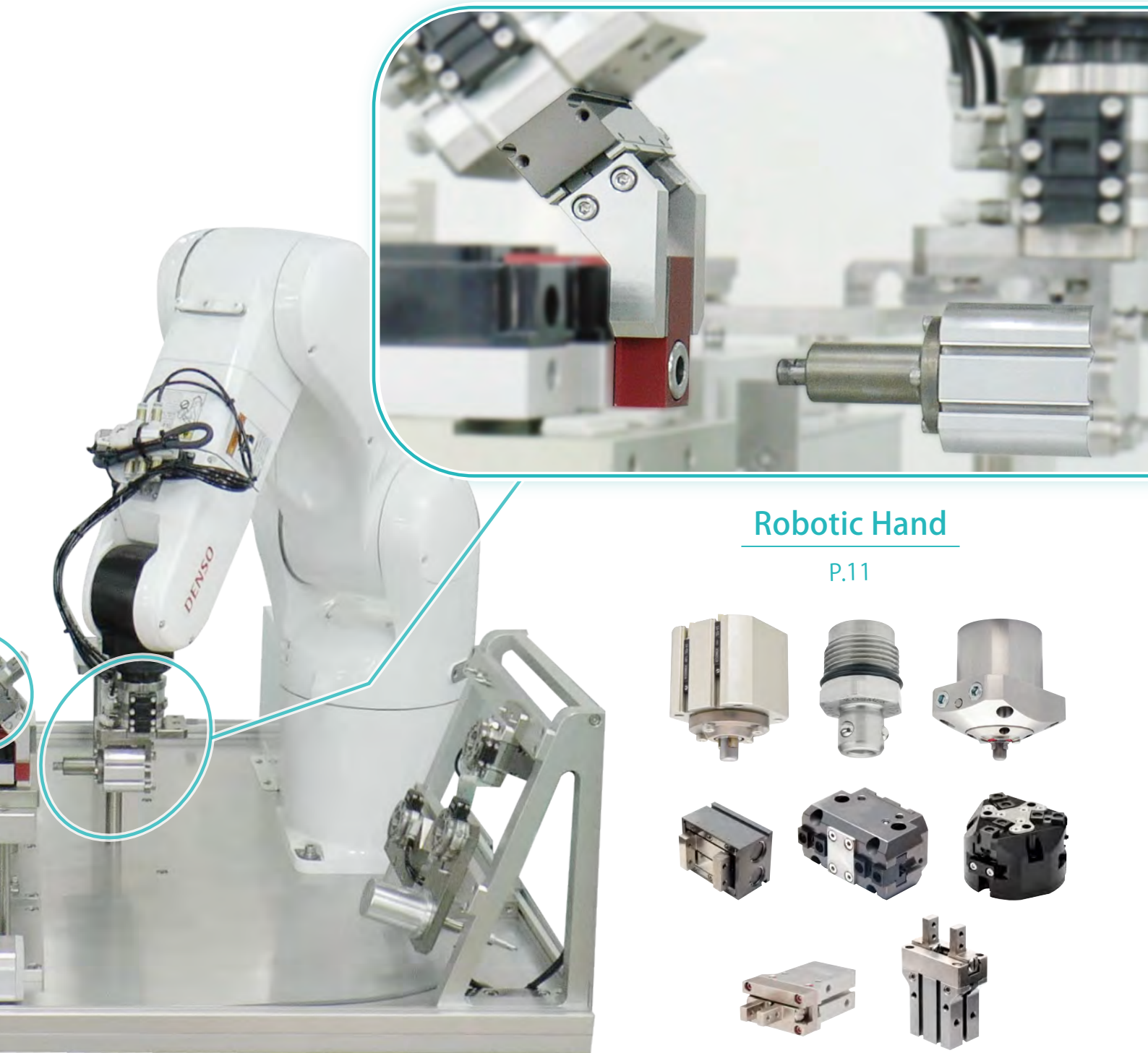
(High Accuracy Locating/Compact Clamp, etc.)

P.19



duction Map

Transfer



Robotic Hand

P.11



Coupler



Support / Back Up



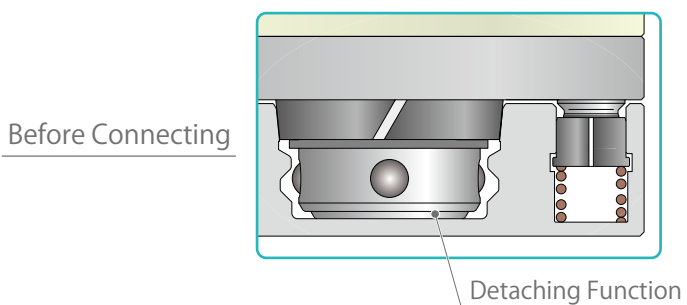
Clamp

The World's Only Robotic Hand Changer with Zero Backlash

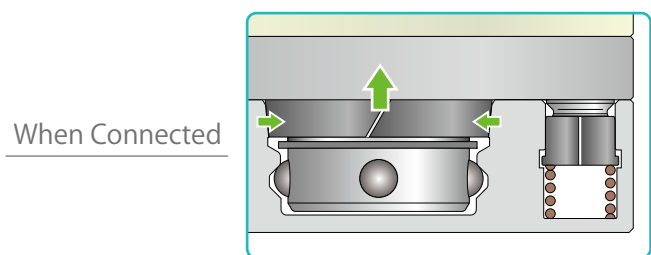
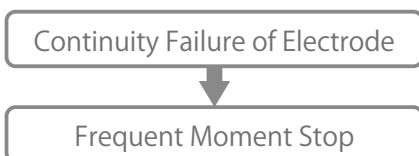
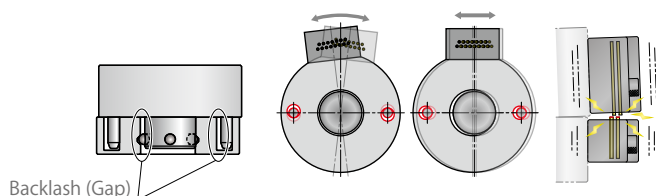
model SWR



KOSMEK Exclusive Non-Backlash Mechanism

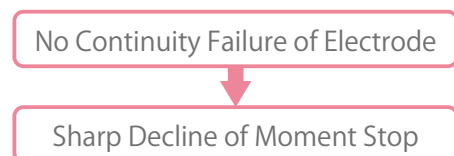
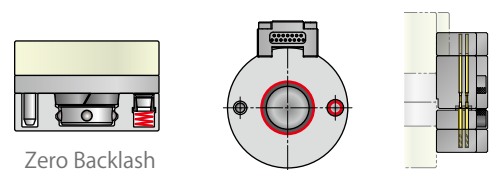


Backlash of a Tool Changer Causes Electrode Errors
Noise and Continuity Failure due to Friction of Contact Probe



Zero-Backlash Connection with Dual Contact

Kosmek Hand Changer with No Backlash
Prevents Electrode Errors No Noise

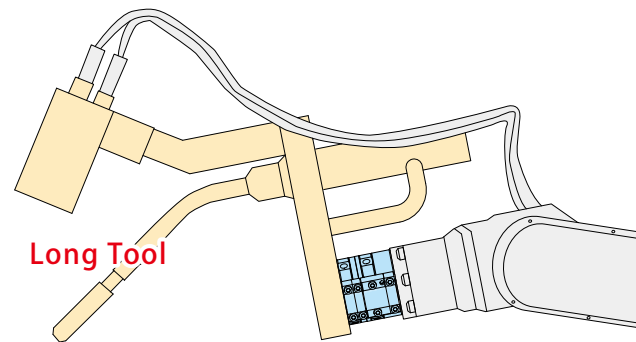


Secures the Aimed Position

When Connected, Locating Repeatability is **$3\mu m$** ※

Even with long tools or hands, fluctuation of the edge is extremely small. It secures high-accuracy processing even after changing tools.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of $5\mu m$.

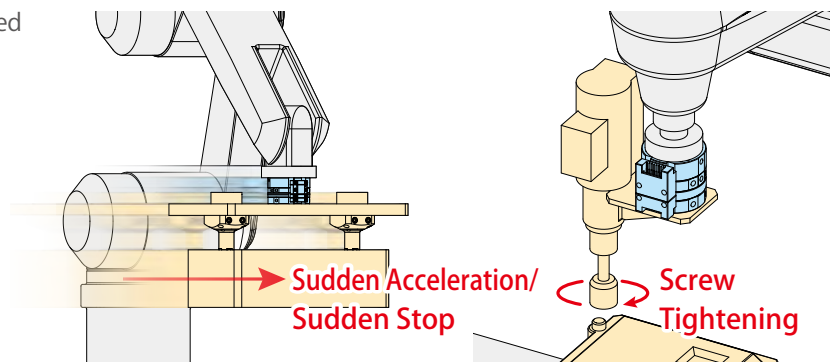


24-Hour Continuous Operation is Possible

Uncomparably High **Rigidity** and **Durability**

Strong to "bend" and "torsion" with high rigidity obtained by non-backlash function. Also, high strength material is used in all the contact part of the master and the tool so that it ensures high durability and $3\mu m$ ($5\mu m$ ※) repeatability even after 1 million cycles.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of $5\mu m$.



Payload : 0.5kg ~ 360kg

A Variety of Electrode/Air Joint Options

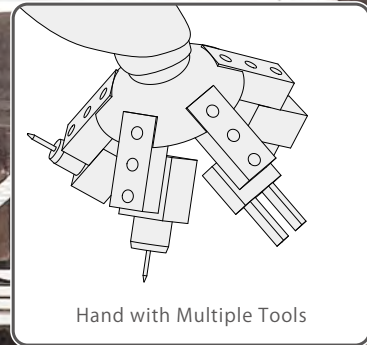
- Resin Connector
- Solder Terminal
- Solder Terminal with Cable
- Waterproof Electrode (Simple Waterproof)
Only when connected : Equivalent to IP54
- D-sub Connector
- Circular Connector (Connector Based on JIS C 5432)
- Power Transmission Option (Connector Based on MIL-DTL-5015)
- Compact Electric Power Transmission (Ability to Transmit AC/DC200V 5A)
- High Current Transmission Option (Connector Based on MIL-DTL-5015)
- Compact Waterproof Electrode (Noncontact Waterproof) IP67
- Waterproof Electrode (Noncontact Waterproof) IP67
- Air Joint (3 Port • Resin Connector/Solder Terminal Extensible Option)
- Air Joint (4 Port • Resin Connector/Solder Terminal Extensible Option)
- Air Joint (2 Port Option)



Advantages of Robotic Hand Changer in Assembly

When Installing Multiple Tools on One Hand

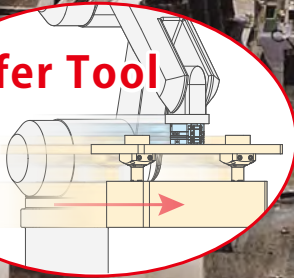
Interference	Frequent
Teaching	Complicated
Robot Size	Large



When Installing Robotic Hand Changer

Interference	Rare
Teaching	Simple
Robot Size	Small

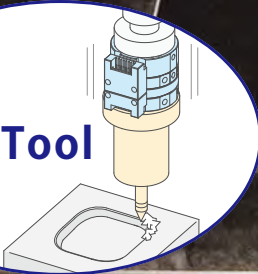
Transfer Tool



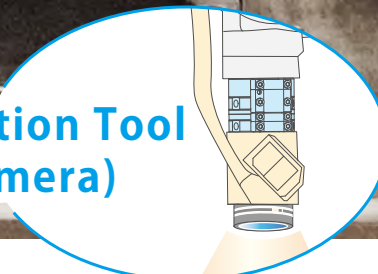
Screw Tightening Tool



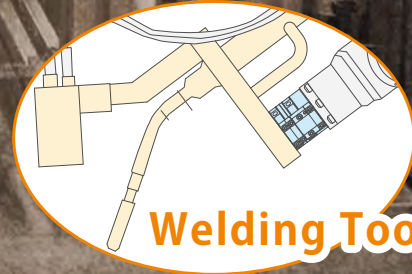
Deburring Tool



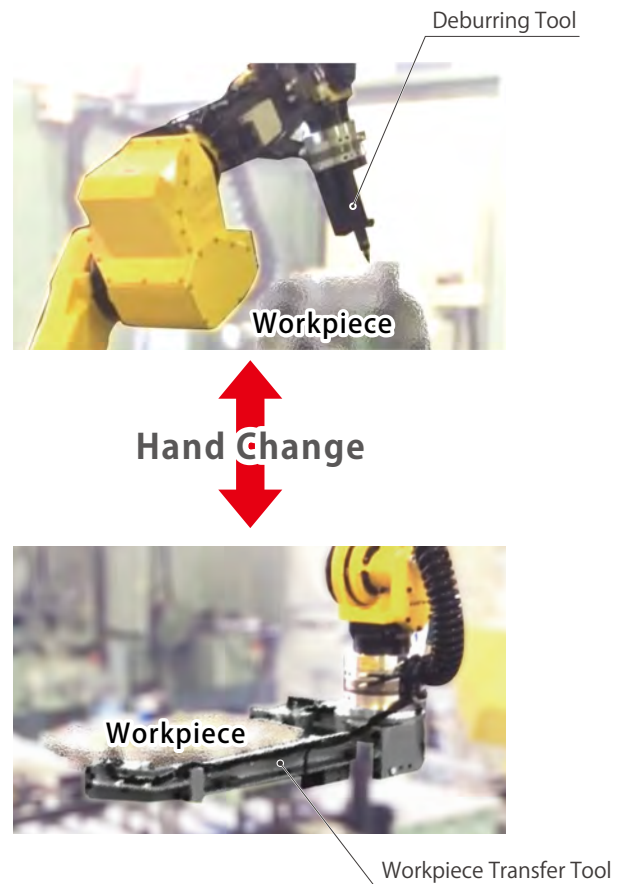
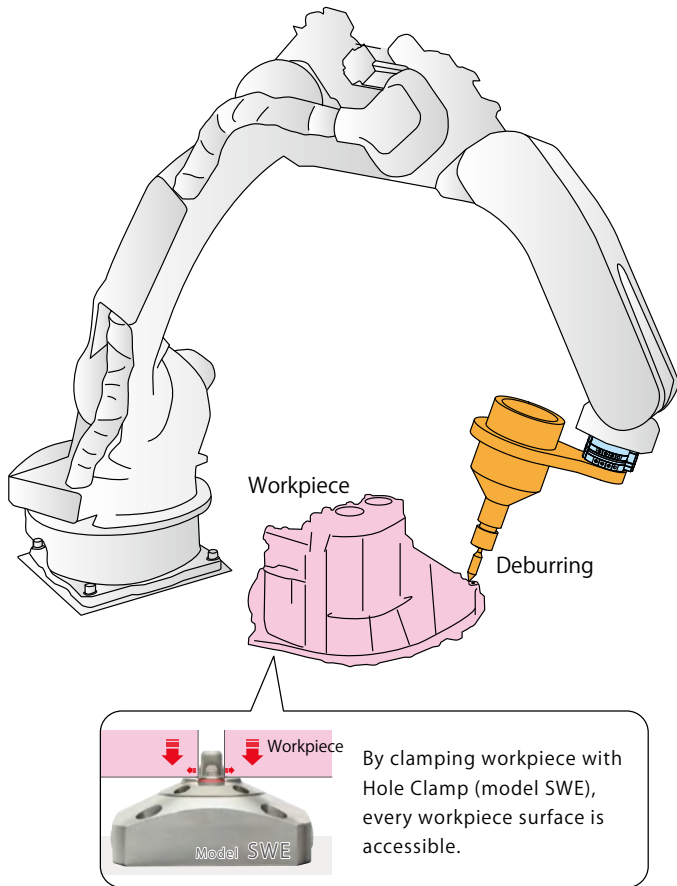
Inspection Tool (Camera)



Welding Tool



Change the Transfer Hand and Deburring Tool with High Rigidity

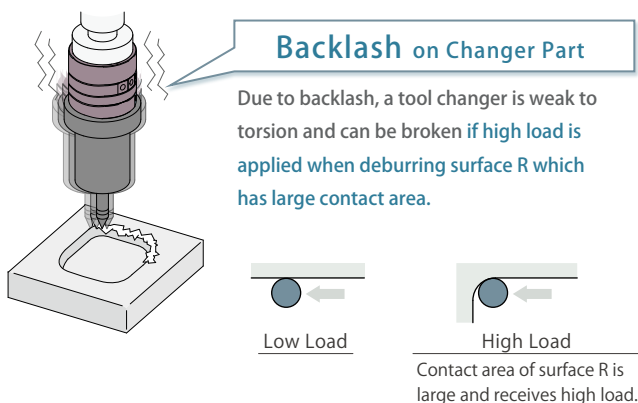


Withstands Heavy Load with Non-Backlash Function

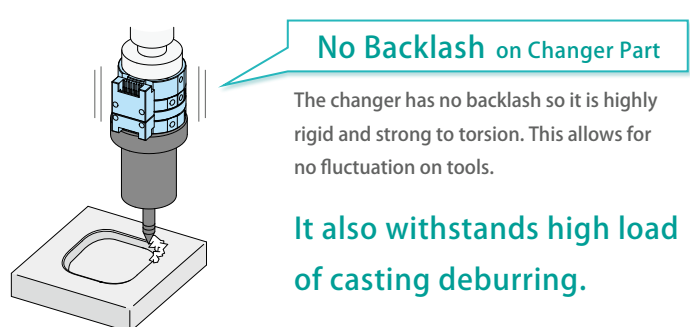
Strong to "bend" and "torsion" with high rigidity.

It ensures stable production even with offset transfer hand or heavy load deburring.

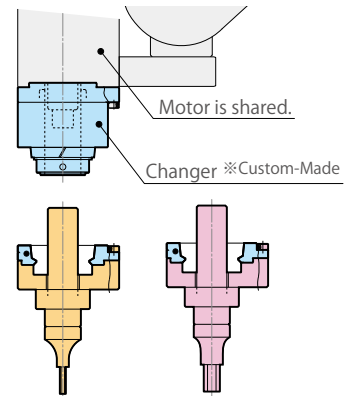
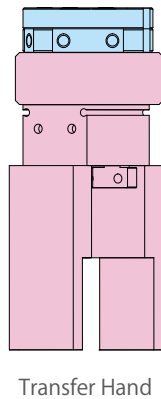
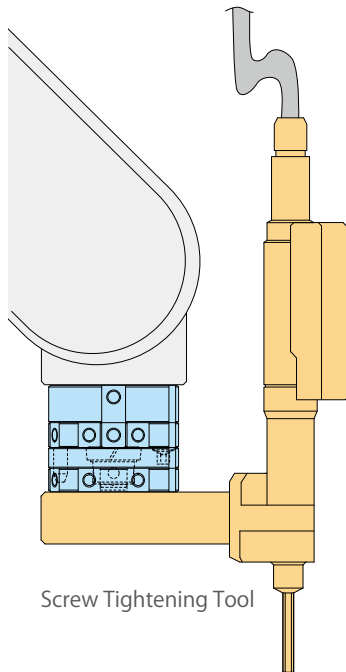
General Tool Changer



Kosmek Robotic Hand Changer



Change the Transfer Hand and Screw Tightening Tool with High Rigidity

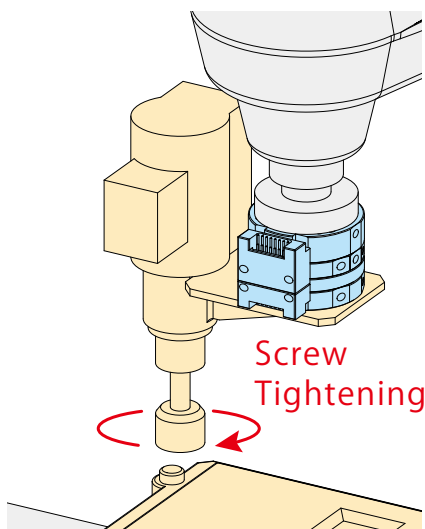


Strong to Torque and Not Damaged by Impact Load

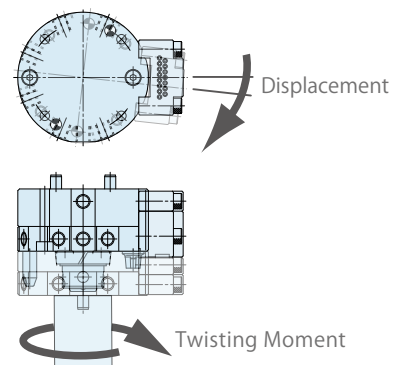
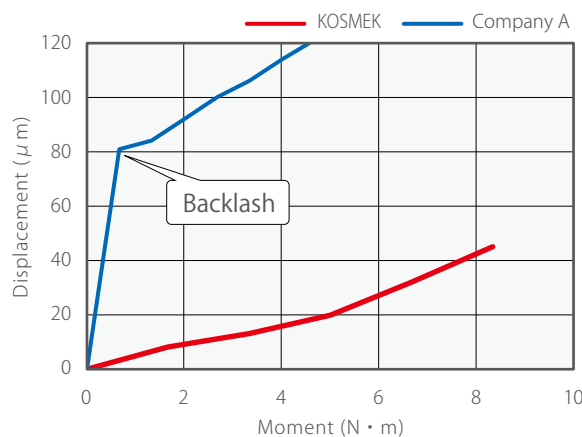
Exclusive non-backlash function is strong to torque and overcomes disadvantages of tool changers. $3\mu\text{m}$ ($5\mu\text{m}$ *) repeatability allows for highly reliable operation without fluctuation of the bit edge.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of $5\mu\text{m}$.

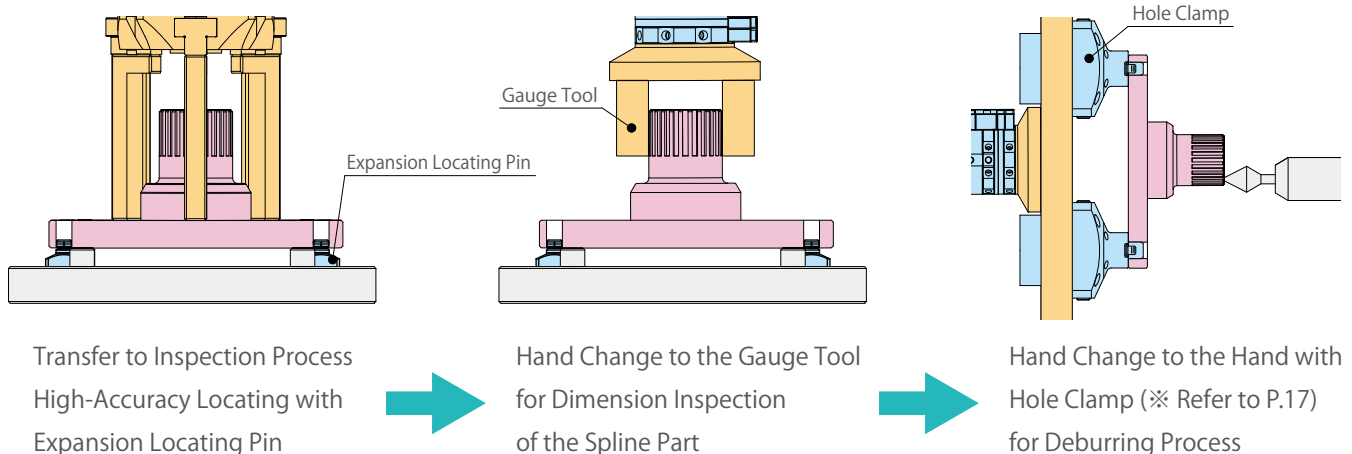
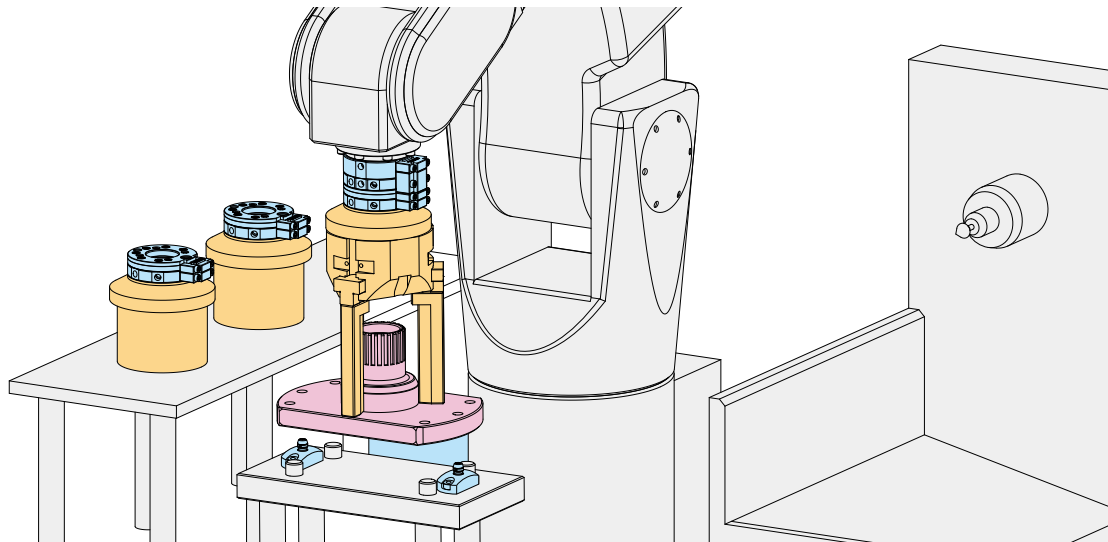
Changing only the bit part enables sharing the motor part.
※Custom-Made Rodless Hollow Option



Moment and Displacement (Equivalent to 5kg Payload)

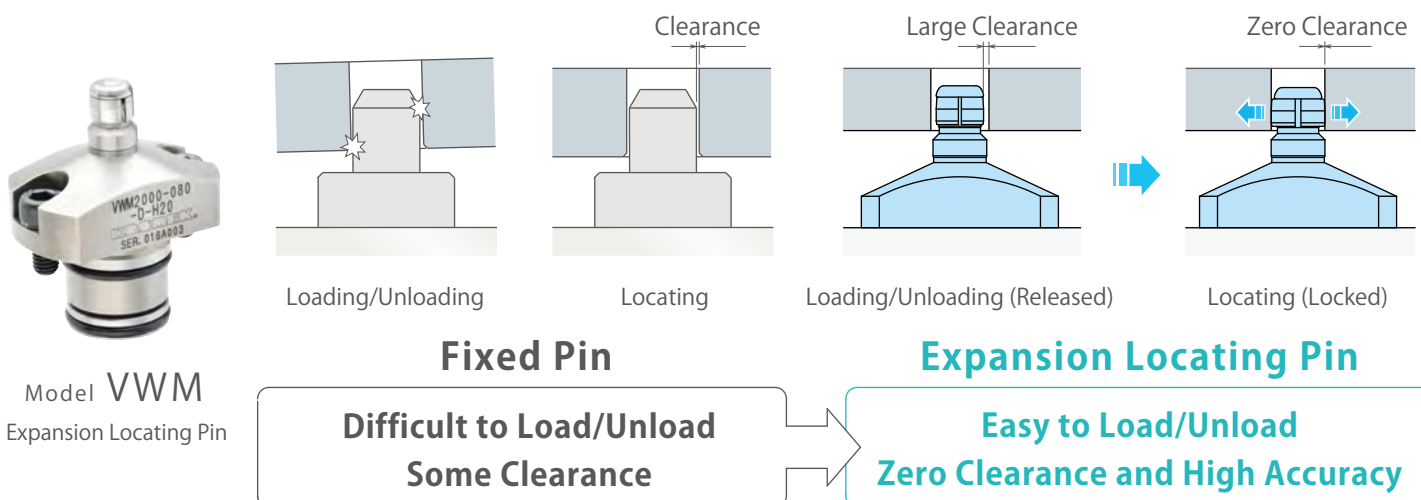


Transfer → Inspection → Deburring One robot performs multiple operations.

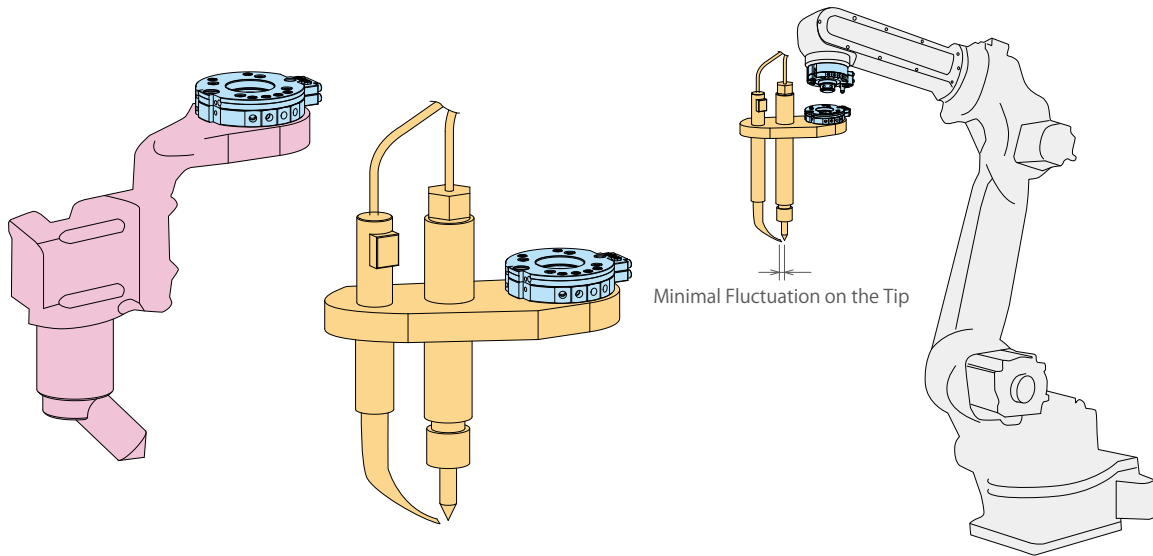


3 μ m Locating Repeatability to Integrate Various Processes

Locating the workpiece side and the tool side with high-accuracy repeatability minimizes errors among processes. This allows for process integration.



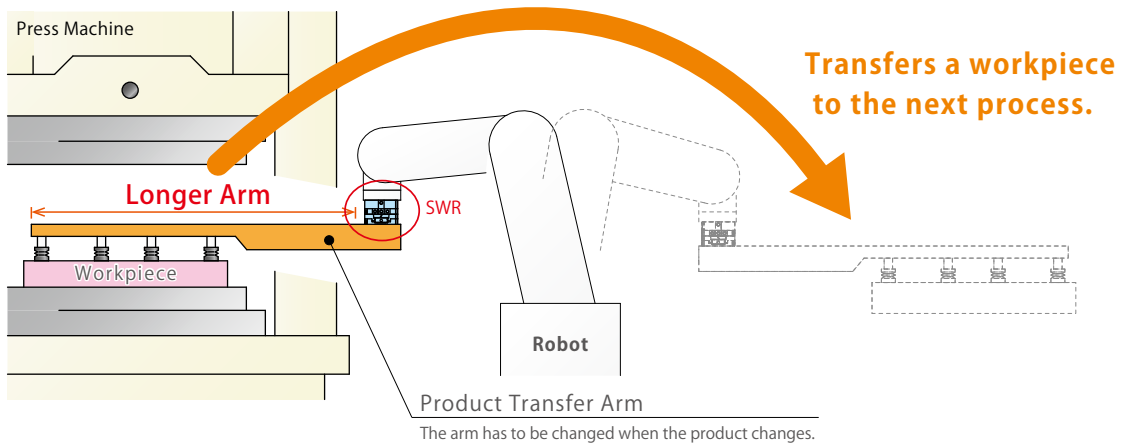
High-Accuracy Change of Welding Torches



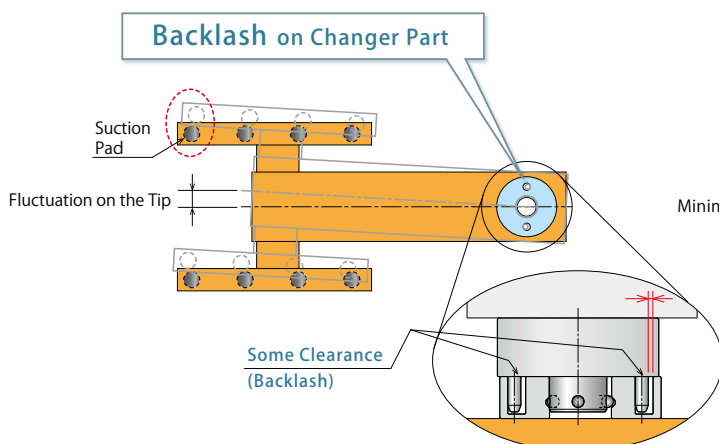
Even when changing longer torches, fluctuation on the tip is extremely small due to $3\mu\text{m}$ ($5\mu\text{m}^*$) repeatability. This enables stable quality and appearance of products.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of $5\mu\text{m}$.

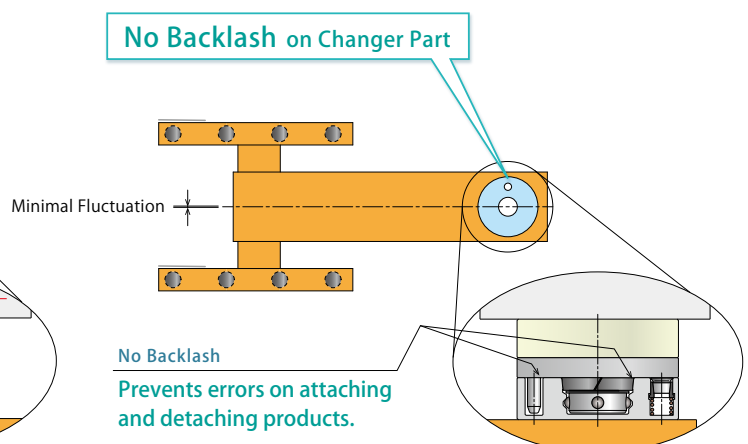
High-Accuracy Change of Transfer Arms



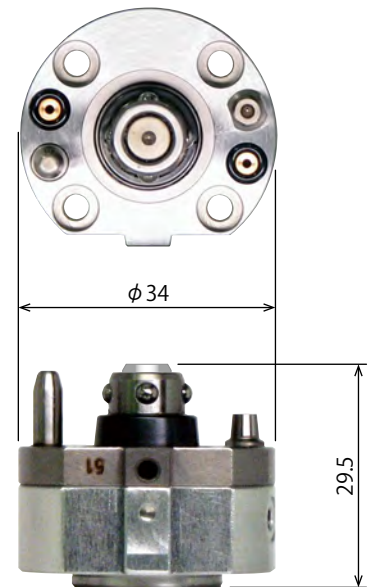
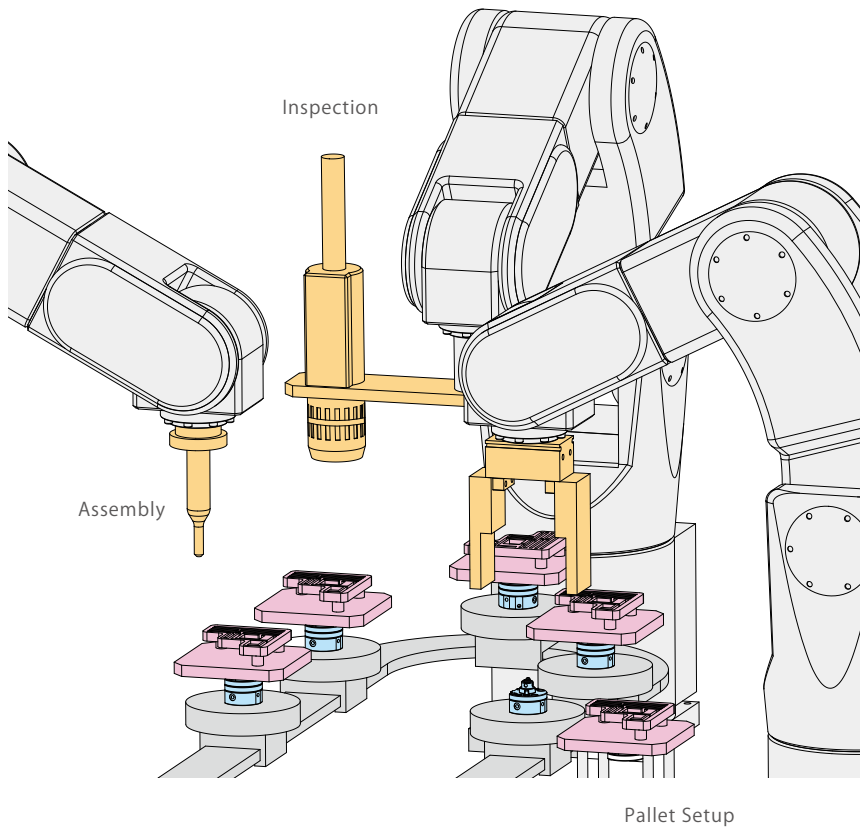
General Tool Changer



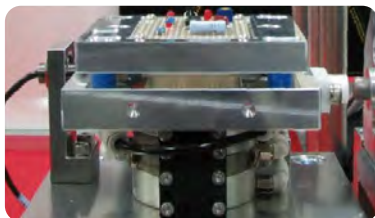
Kosmek Robotic Hand Changer



High-Accuracy and Compact Pallet Change



3kg-Payload Robotic Hand Changer
(Full Scale)
Holding Force : 500N (at 0.5MPa)

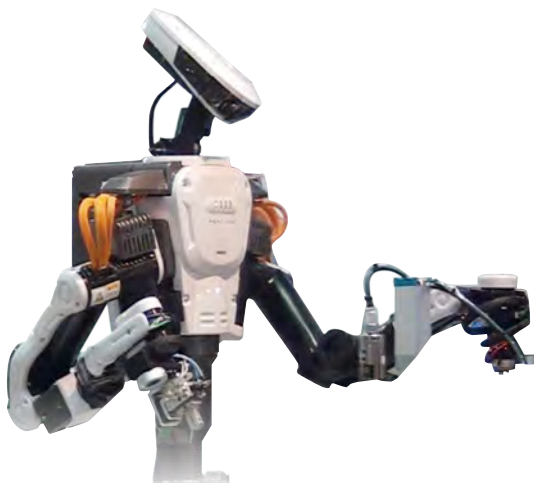


Locates and Clamps Simultaneously with One Unit

Locates and clamps a small pallet such as electronic component within a more compact space. Locating error between processes can be minimized by $3\mu\text{m}$ ($5\mu\text{m}^*$) repeatability.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of $5\mu\text{m}$.

For Highly Versatile Humanoid Robot



Highly versatile humanoid robot requires multiple hands, and tool change is essential. Kosmek robotic hand changer ensures its lightness, high accuracy, high rigidity, and longer operational life.

Suitable for Tool Changer with Camera Corrector

When adjusting position with camera corrector installed not on the tool side but on the robot side, accuracy of the changer affects the displacement amount of the tool end. Kosmek tool changer has high locating accuracy and this allows minimal error of camera corrector.

Light•Compact Robotic Hand Series

For More Automation Solutions



External Chuck

Internal Chuck : FA Pneumatic Hole Clamp

Kosmek Exclusive Internal Chuck Series

FA Pneumatic Hole Clamp

Model WKH

Gripper expands and pulls workpiece in.

Light Body with Selectable Functions : Locating and Floating

Workpiece Diameter $\phi 6 \sim \phi 14$ in 0.5mm increments.



Air Lock / Air Release

Self-Lock Function with Spring

High-Power Pneumatic Hole Clamp

Model SWE

Can be used in machine tools. Gripper expands and pulls workpiece in.

High Power with Foreign Substance Prevention for Machine Tools, etc.

Workpiece Diameter $\phi 6 \sim \phi 13$ in 0.5mm increments.



Air Lock / Air Release

Self-Lock Function with Spring

Ball Lock Cylinder

Model WKA

Secures/Transfers a pallet and prevents falling off with steel balls.

Powerful, Light and Compact

Pull-Out Load Capacity (Holding Force) : 50N / 70N / 100N



Spring Lock / Air Release

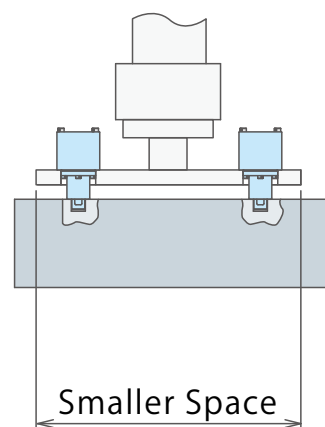
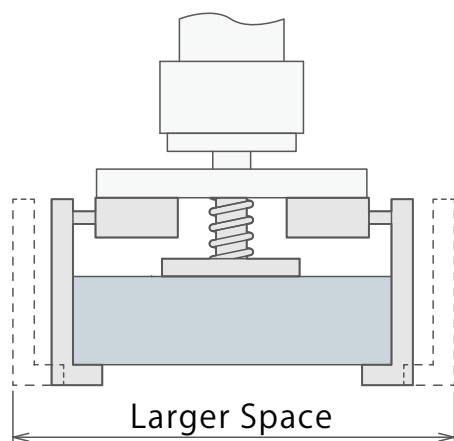


Advantages of FA Pneumatic Hole Clamp

Model WKH FA Pneumatic Hole Clamp

Chuckling Inside of Workpiece Holes Allows for

Compact and **Light** Applications

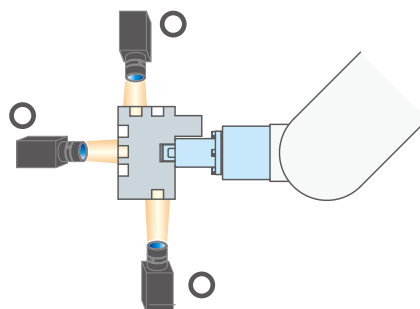
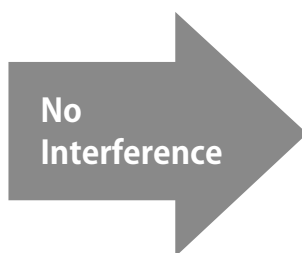
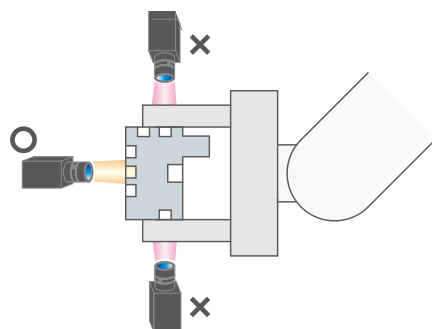


Loading/Lifting Hand with Parallel Hand/Linear Cylinder

Hole Clamp is Compact and Light with Powerful Gripping Force

Chuckling Inside of Workpiece Holes Allows for

Zero Interference and **Minimum Setup**



Interferes with the hand when holding a workpiece.

5 Faces Accessible with No Interference

External Chuck Series

Robotic Hands

Model WPS / WPA
WPH / WPP / WPQ

Compact Body with High Gripping Force
Highly Versatile Robotic Hands for Various Usage



High-Power Parallel Gripper
Model WPS



Parallel Gripper
Model WPA



Parallel Gripper
Model WPH



Three-Jaw Chuck
Model WPP



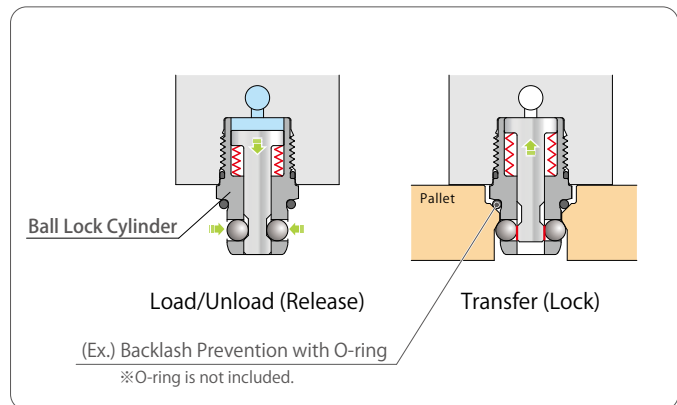
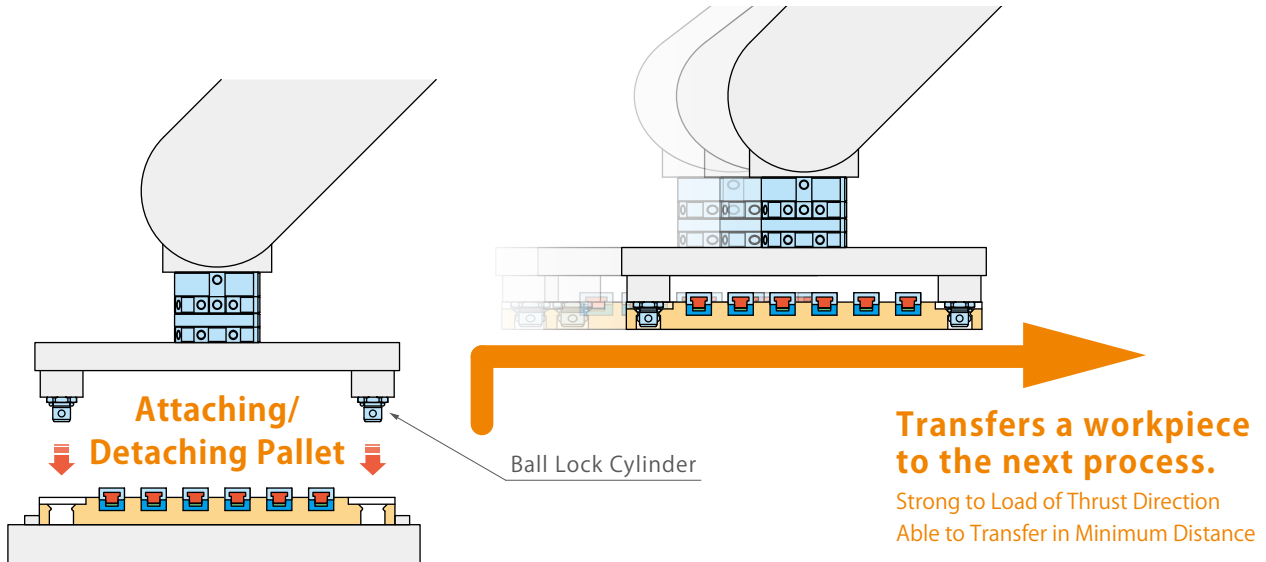
Two-Jaw Chuck
Model WPQ

Air Lock / Air Release



For Faster and More Accurate Pallet Transfer

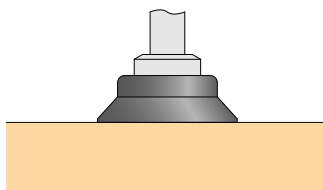
Model WKA Ball Lock Cylinder



Current Method

Suction Pad

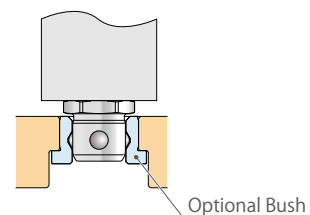
Limited Speed
Low Suction Force



Suction Pad has critical weight limits and speed limits due to low suction force. Also, the suction force is affected by the roughness of surface and is decreased due to deterioration and friction.

Ball Lock Cylinder

Powerful • Light • Compact with Mechanical Lock
Single Circuit for Positive Pressure Only



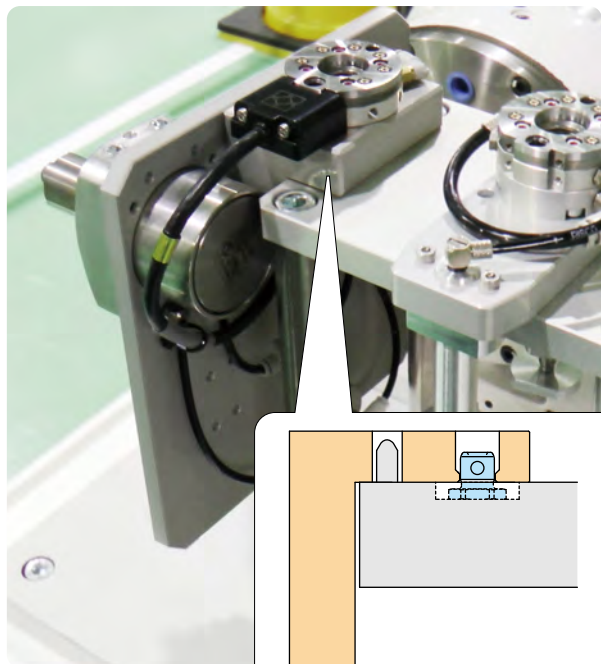
Requires Hole Machining

Optional bush simplifies hole machining.

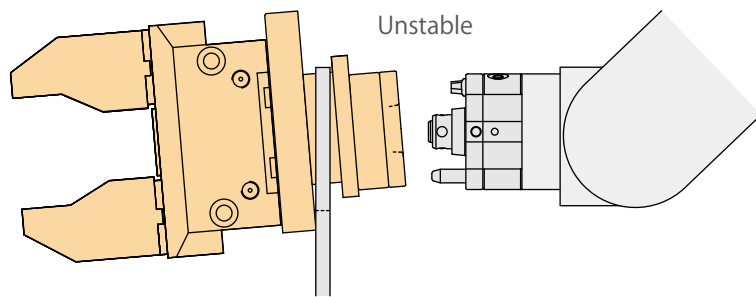


For More Compact Tool Stocker and More Reliable Hand Change

Model WKA Ball Lock Cylinder

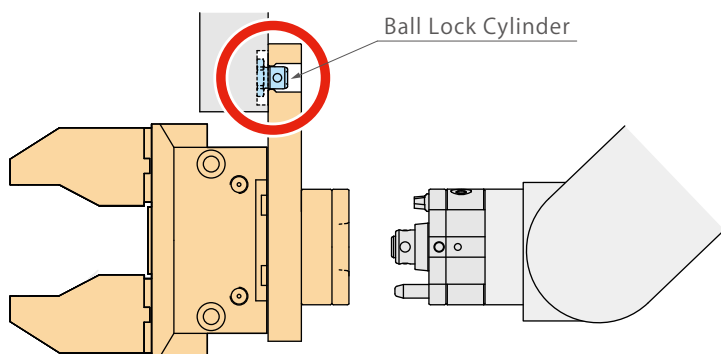


Offset Hand



Hook-Type Stand

The hand placed on the hook is inclined and causes frequent errors when attaching/detaching.



Ball Lock Cylinder

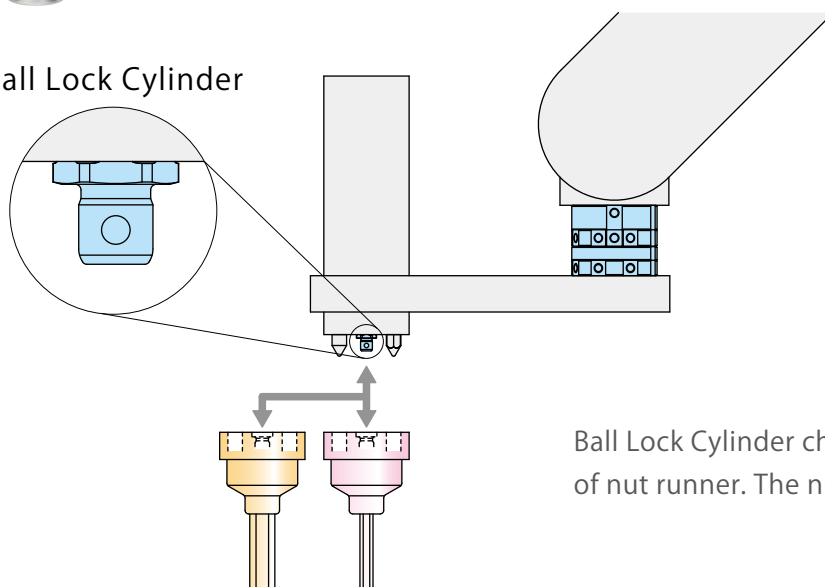
Keeps it horizontal even with offset hand.
Prevents error at changer attaching/detaching.



Bit Change of Nut Runner

Model WKA Ball Lock Cylinder

Ball Lock Cylinder

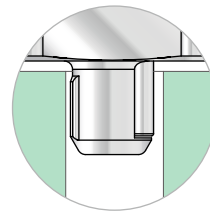
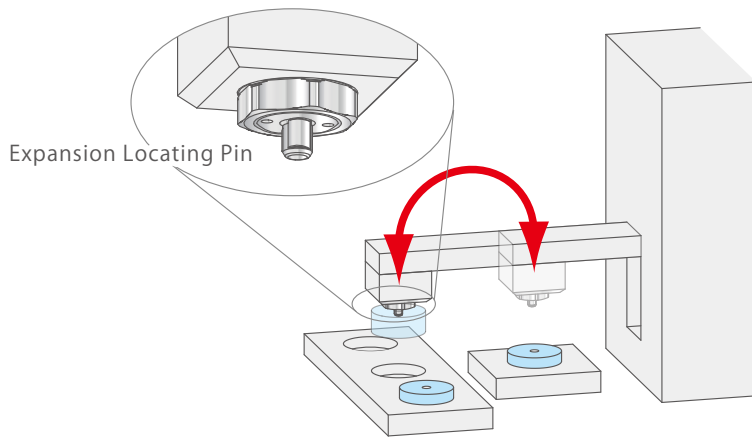


Ball Lock Cylinder changes only the bit part of nut runner. The nut runner part is shared.

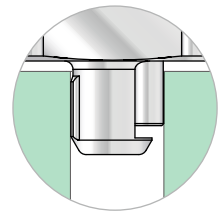


For Internal Chuck of Smaller Holes

Model VRA/VRC Expansion Locating Pin



When Released



When Locked

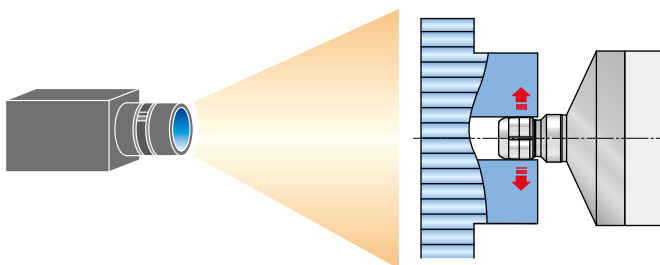
High-Accuracy Locating Prevents Assembly Errors of Small Components

Expansion Locating Pin has high accuracy locating (repeatability: $3\text{ }\mu\text{m}$) suitable for assembly of small electronic components (motor parts, camera module, etc.) which are about the size of the tip of the finger. This allows for more compact applications.

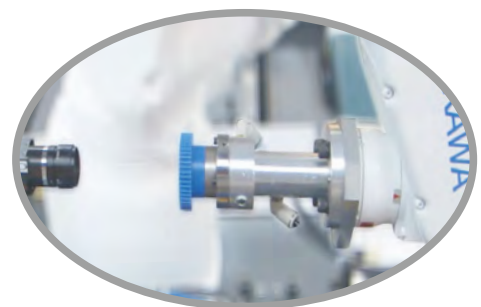
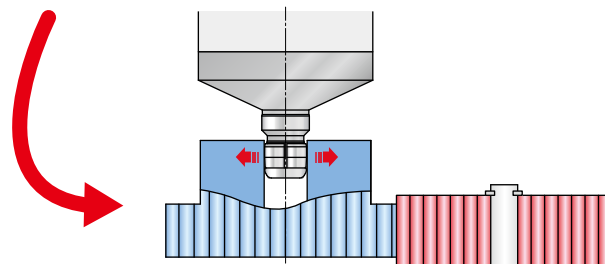


For Internal Chucking and Locating

Model VWM Expansion Locating Pin



After checking the position by camera, keeps the proper position to install it.

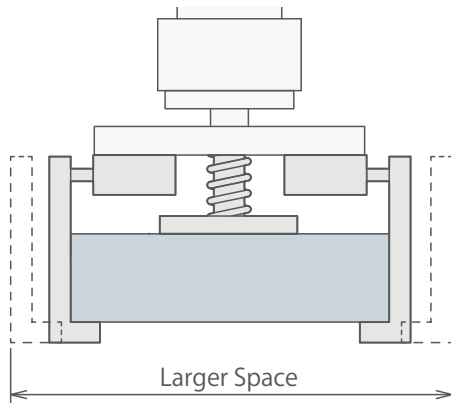


Suitable for Workpiece Image Inspection

Clamps the inner diameter of workpiece hole and locates with high accuracy (locating repeatability $3\text{ }\mu\text{m}$). Allows for compact applications and improves accuracy of inspection and assembly.

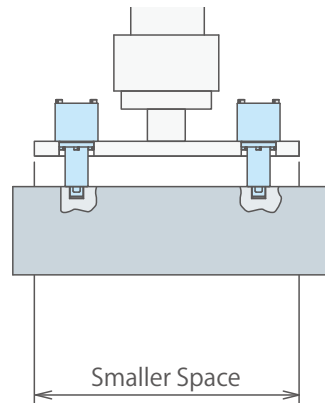
From Light to Heavy Workpieces

Current Method



Loading/Lifting Hand with Parallel Hand/Linear Cylinder

FA Pneumatic Hole Clamp

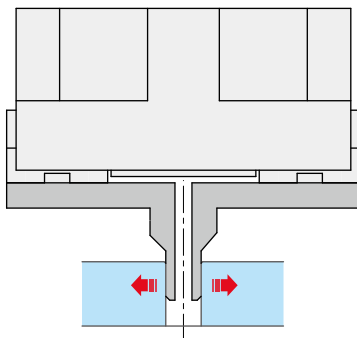


Model **WKH**
Workpiece Hole Diameter:
 $\phi 6 \sim \phi 14$

Compact and Light with Powerful Gripping Force
Small Stroke with High Operation Speed

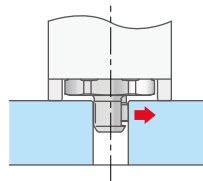
For Light Workpieces with Small Diameter Holes

Current Method



Heavy•Large•Low Accuracy
Thin lever tip is not suitable for smaller diameter hole.
Low rigidity of the gripper tip has low durability.

Expansion Locating Pin

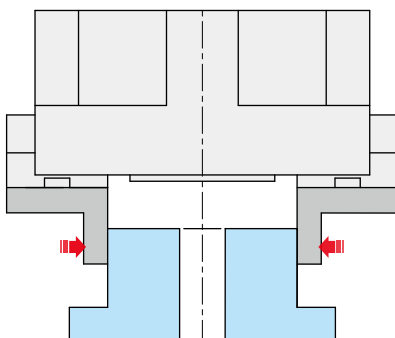


Model **VRA/VRC**
Workpiece Hole Diameter:
 $\phi 3 \sim \phi 6$

Light•Compact•High Accuracy
Easy to Control with Spring Lock•Air Release

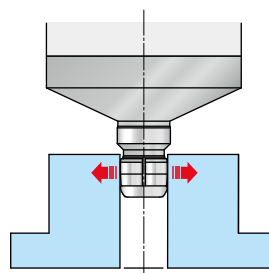
For Workpieces which Require Locating Accuracy

Current Method



Heavy•Large•Low Accuracy
Clamping part interferes with outer inspection or approach.

Expansion Locating Pin



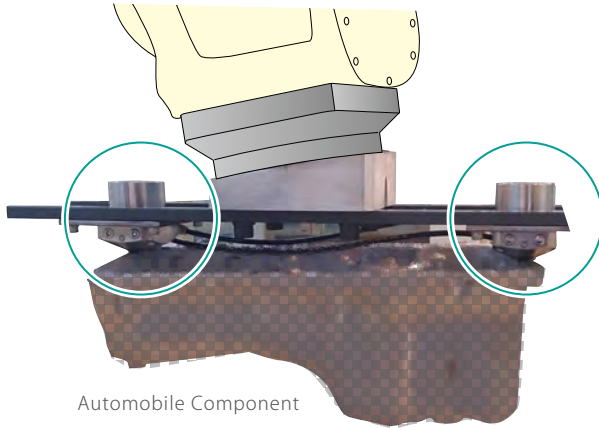
Model **VWM**
Workpiece Hole Diameter:
 $\phi 8 \sim \phi 20$

Light•Compact•High Accuracy
No interference on outer surface and suitable for inspection, etc.
Small Stroke with High Operation Speed



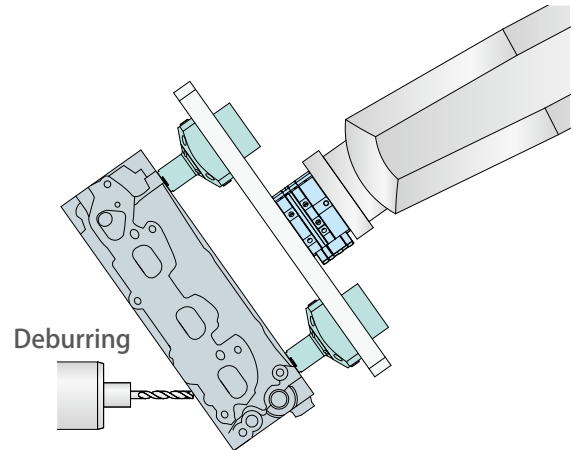
Light and Compact Transfer Hand for Heavy Workpieces

Model SWE High-Power Pneumatic Hole Clamp



Automobile Component

Transfer the Heavy Workpiece with Light Hands



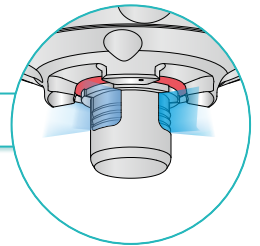
5 Faces Accessible with No Interference

Save Energy with Light Hands

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

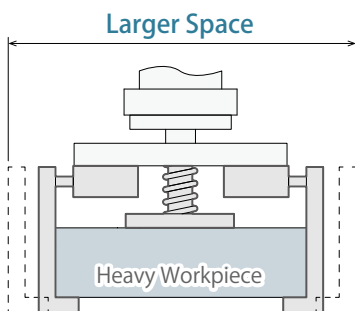
Air Blow

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



Current Method

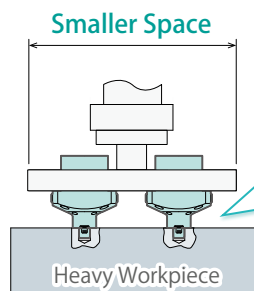
Linear Cylinder



Heavy • Large

High-Power Pneumatic Hole Clamp as Transfer Hand

Reduce the Hand Weight



Light • Compact • High Accuracy
Self-lock function ensures safety.

Gripper expands and pulls workpiece in.



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

Even at zero pressure, it will stay locked with internal spring and prevent workpiece falls.

Clamping Force at 0MPa : **0.25 kN**

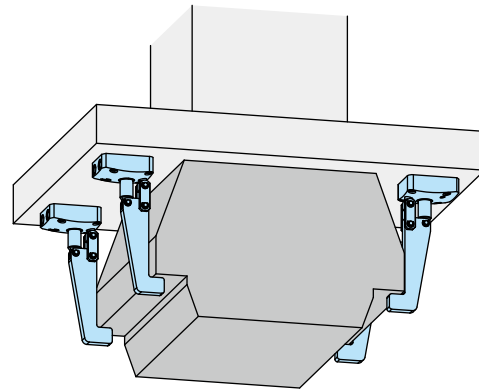


Light and Compact Transfer Hand for Irregular Shaped Workpieces

Model WCE High-Power Pneumatic Link Clamp

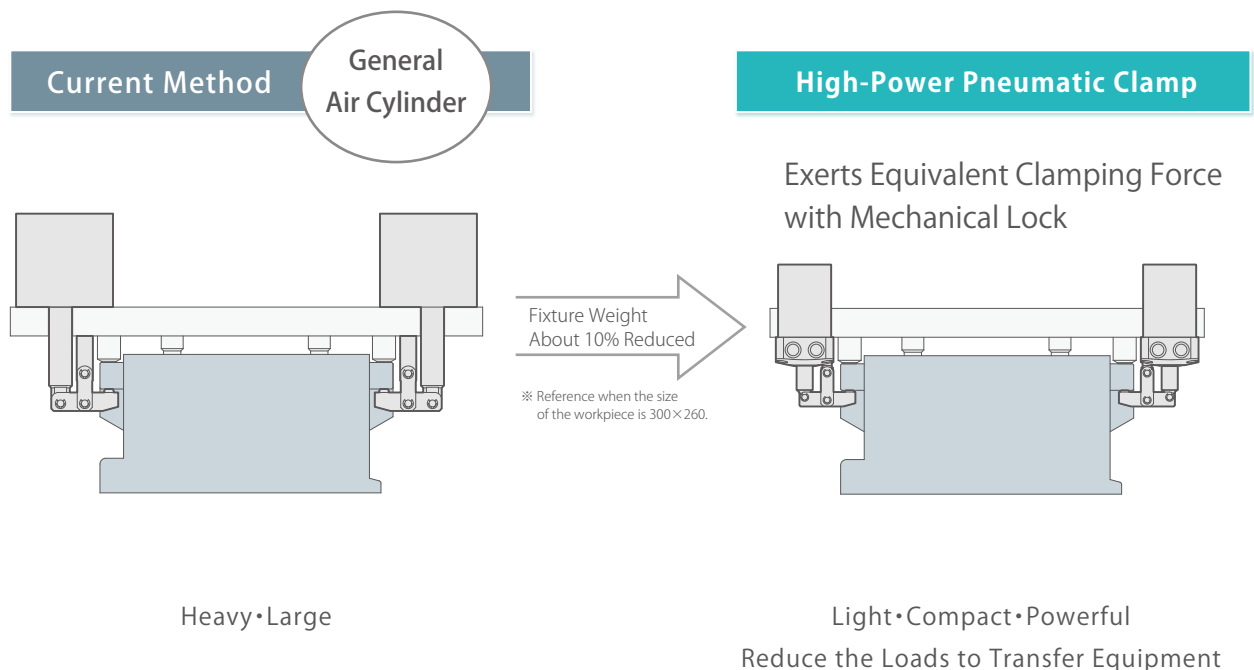


Automobile Component



Compact and High-Power Clamp with Self-Locking Function

Compact and high-power clamp cylinder with exclusive mechanical locking structure.
Internal self-locking holds workpiece even when air supply is stopped.
Introduced for Irregular Shaped Workpiece Transfer Hand



Automation Products

For More Automation Solutions

Instant Change of Workpiece • Pallet



Model SWT

Pallet Clamp / Screw Locator

Model SWQ / SWT / VXE / VXF

Clamps and Locates a Pallet and Plate

Locating Repeatability SWQ / SWT / VXF : $3\text{ }\mu\text{m}$, VXE : $5\text{ }\mu\text{m}$



Model SWQ / SWT

Location Clamp

Air + Spring Lock / Air Release

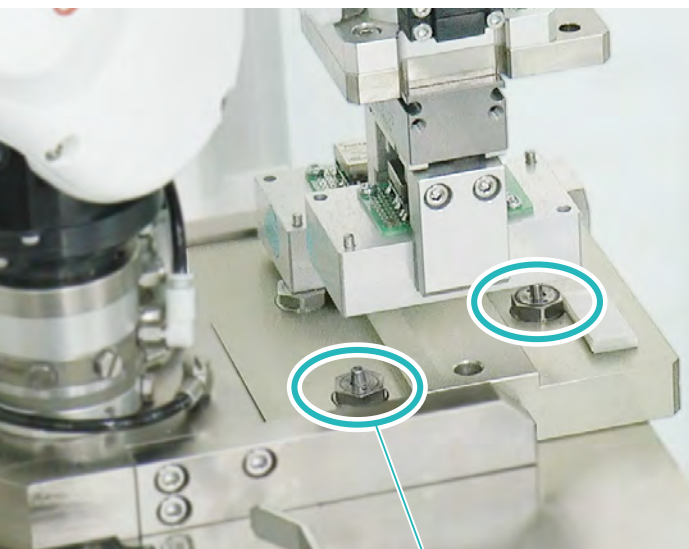
Self-Lock Function with Spring

Model VXE / VXF

Screw Locator

Manual Lock / Manual Release

High-Accuracy Locating of Workpiece • Pallet



Model VRA

Expansion Locating Pin

Model VRA / VRC / VWM / VX

Zero Clearance with High-Accuracy Locating Pin

Workpiece Hole Diameter : $\phi 3 \sim \phi 20$



Model VRA/VRC

Locating Repeatability $3\text{ }\mu\text{m}$

Spring Lock / Air Release

Model VWM

Locating Repeatability $3\text{ }\mu\text{m}$

Air + Spring Lock / Air Release

Model VX

Locating Repeatability $5\text{ }\mu\text{m}$

Manual Lock / Manual Release

Powerful Support for Unstable Parts

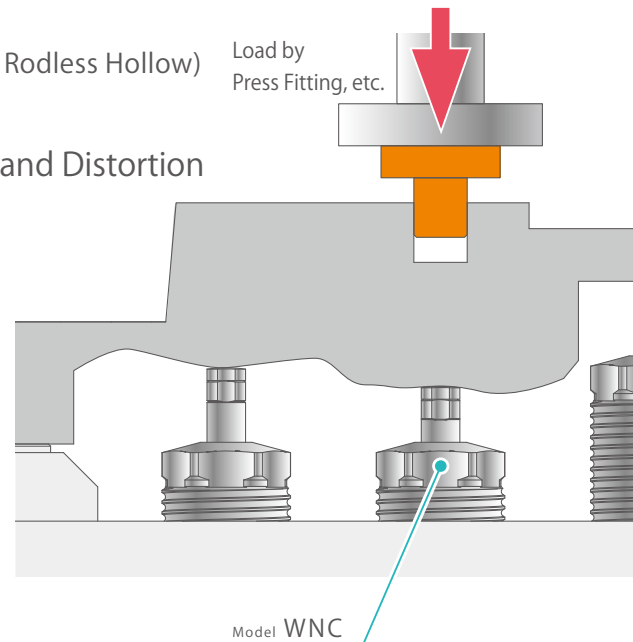
High-Power Pneumatic Work Support (Standard / Rodless Hollow)

Model WNC / WNA

Firmly Supports the Workpiece and Prevents Chattering and Distortion

Locks when the tip of work support contacts a workpiece.

Securely supports a workpiece with various heights.



Clean and Powerful Clamping with Air Pressure • Mechanical Lock

High-Power Pneumatic Clamp

Model WHE / WCE / SWE

Powerful Clamping Force with Air Pressure and Holding Force with Mechanical Lock

Clamping force which withstands the load with holding force does not distort the workpiece.



Model WHE
Swing Clamp



Model WCE
Link Clamp



Model SWE
Hole Clamp

Auto Coupler to Supply Positive • Negative Pressure

Auto Coupler

Model JTA/JTB JTC/JTD
JVA/JVB JVC/JVD JVE/JVF



Compact Coupler to Connect Hydraulic/Pneumatic Circuits

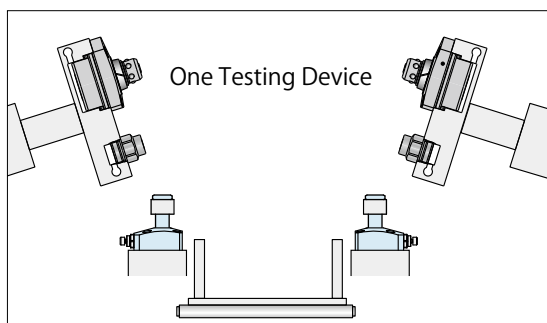
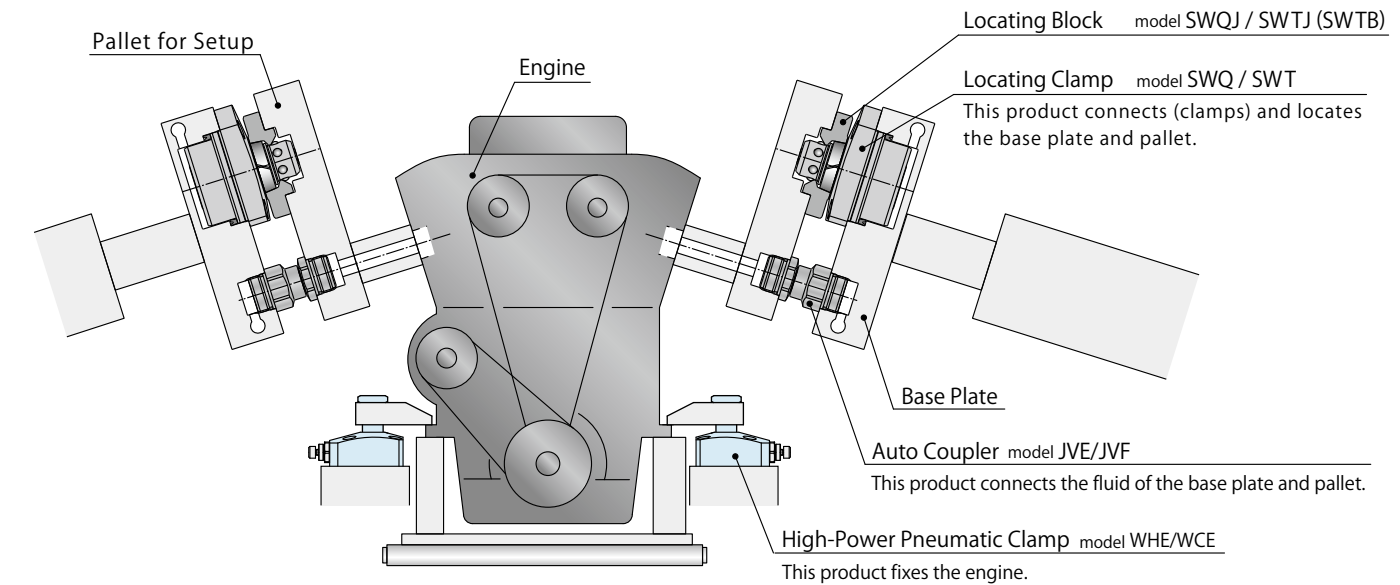
Connection Stroke : 1mm Easily Used with Screw Locator and Pneumatic Location Clamp



Automatic Setup of Cold Oil Testing Bench

Model SWQ / SWT / JV□ / WHE

Location Clamp / Auto Coupler / High-Power Pneumatic Swing Clamp

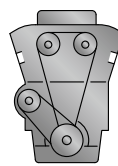


Standardize the Workpieces

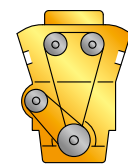


Change the Pallets

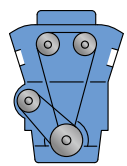
Engine A



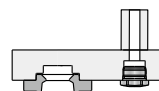
Engine B



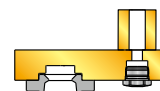
Engine C



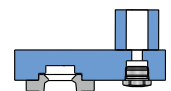
Pallet for Engine A



Pallet for Engine B

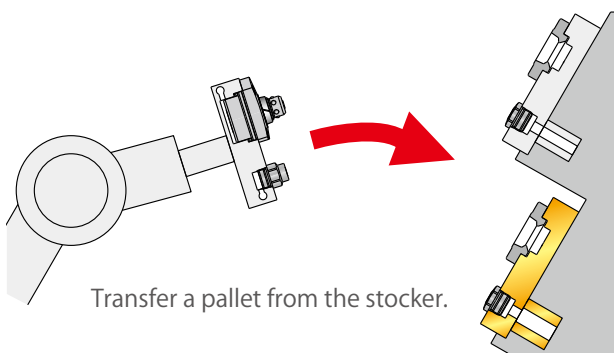


Pallet for Engine C



Productivity Improvement and Application Standardization with Automatic Setup

In an engine cold testing (engine function test in non-fired state), every time an engine model changes, a testing device had to be exchanged due to the design of the testing device. Applying the pneumatic location clamp to a part (the joint part of an engine and testing device) of testing device enables the automatic setup exchange (time reduction in setup) by the robot.



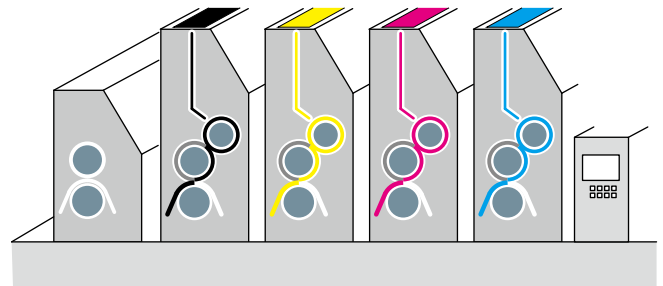
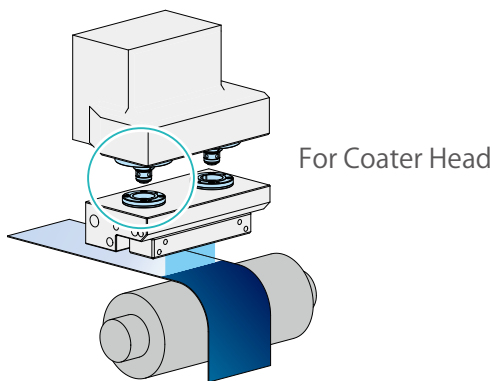
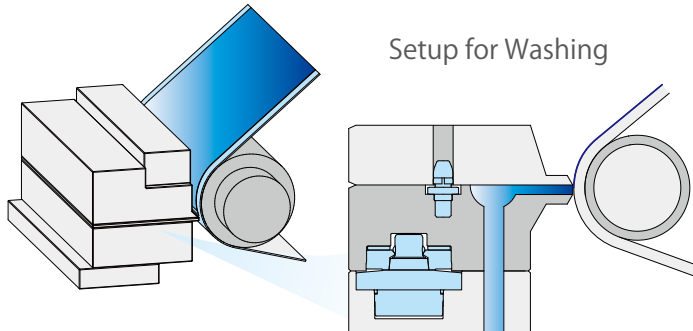
Automatic Pallet Change with Robot

With high accuracy (locating repeatability: $3 \mu\text{m}$) of Location Clamp, dislocation of the pallet is minimum during setup, and this allows for almost the same operation. Also, it ensures safety with self-locking to hold a pallet without air supply.



Automatic Setup of Coating • Printing Device

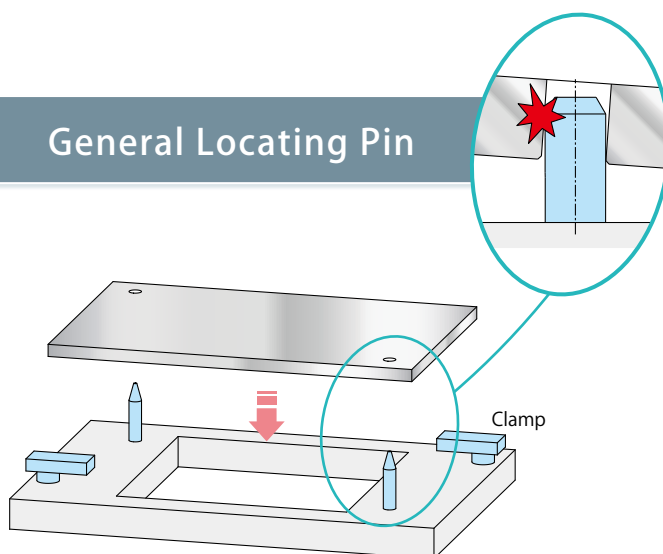
Model SWQ / SWT Location Clamp



Reduces Setup Time and Ensures High Coating/Printing Quality

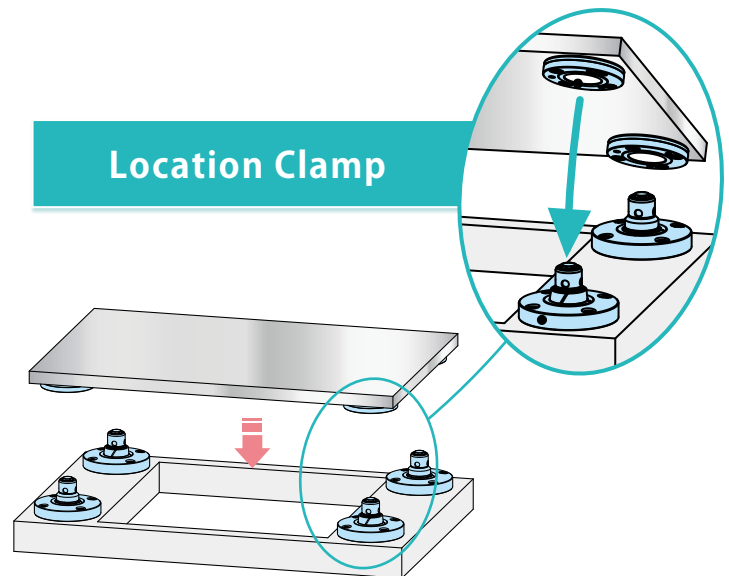
With $3\mu\text{m}$ locating repeatability it minimizes dislocation during coating unit/roller unit setup and keeps high quality of coating and printing.
Suitable for automation with simultaneous locating and clamping.

General Locating Pin



Unstable Locating Accuracy (It depends on clearance.)
Requires high accuracy transfer due to interference.
Requires space for clamps.

Location Clamp

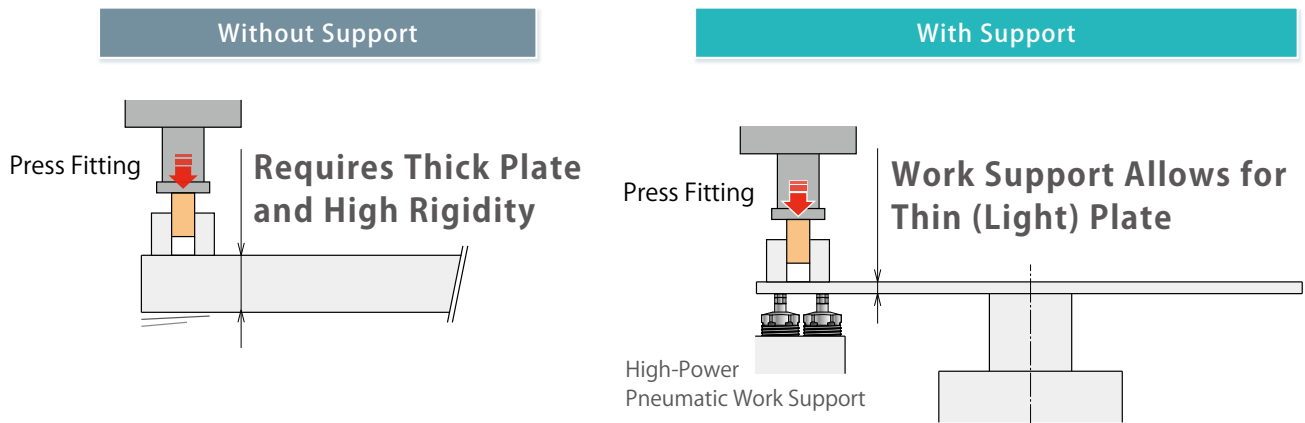
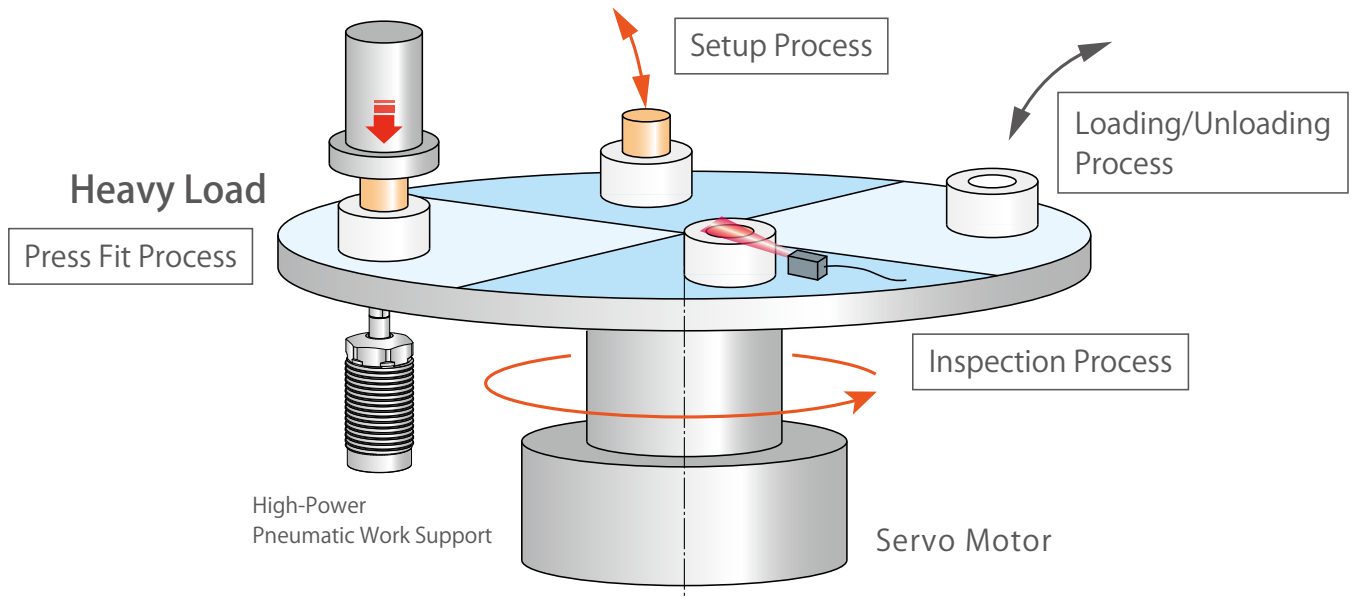


High Accuracy (Locating Repeatability : $3\mu\text{m}$)
Lift-up function enables to set workpiece without obstruction.
Locates and clamps at the same time.



For Minimizing Application with Partial Improvement of Rigidity

Model WNC High-Power Pneumatic Work Support



Supports Load to Reduce the Size of Application and Cost

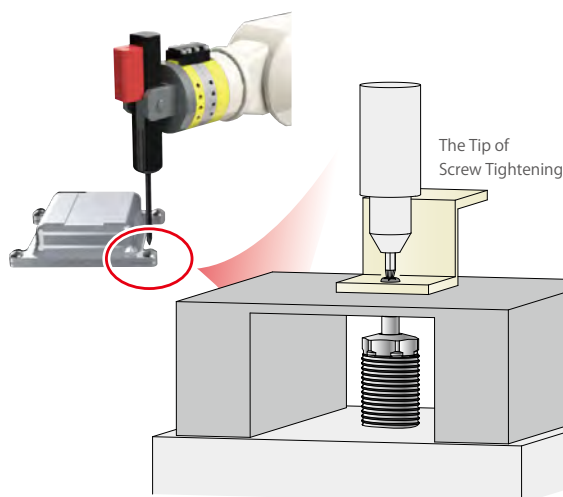
When load is applied on only one process of rotary table, another application with rigidity is required to withstand the load. Also, since the rotating torque increases, a larger servo motor is required and application has to be larger and more expensive.

Supporting the load with high-power pneumatic support enables a thinner rotary table and compact servo motor. This allows for more compact application, cost reduction and quality improvement.

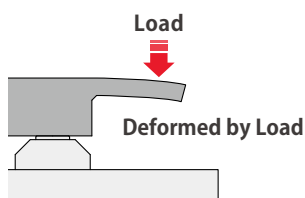


Backup of Screw Tightening

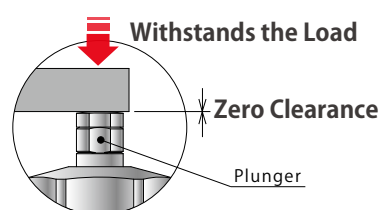
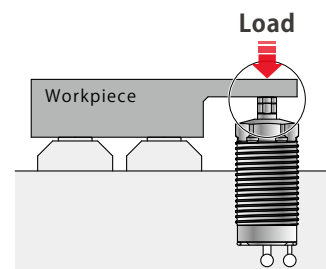
Model WNC High-Power Pneumatic Work Support



Without Support



With Support



Prevents Deformation Caused by Pressing and Improves Quality

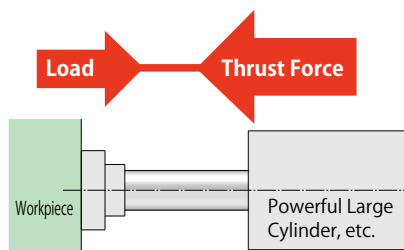
Work support prevents dislocation and deformation caused by load during assembly and/or press fitting. Contact force (force with internal low spring) applied to a workpiece is only slight. It supports a workpiece without applying much load.



Backup of Automatic Setup with Electric Cylinder

Model WNA Rodless Hollow Work Support

Without Support

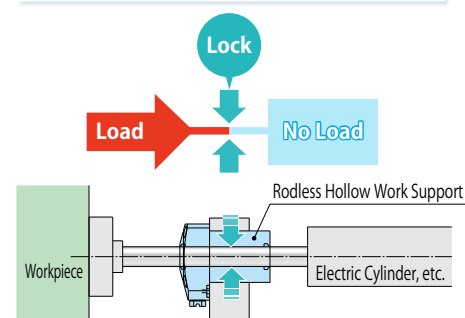


Requires powerful cylinder to withstand the load.

Excessive thrust is applied to the workpiece.

Overload can be applied to the cylinder.

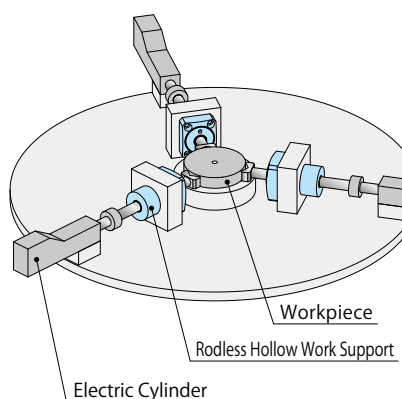
With Support



Work support grips and holds the rod so that the cylinder does not receive the load. Compact and low power cylinder can be selected.

Able to use the cylinder with minimal thrust.

Does not transmit the load to the cylinder and prevents the overload.





Single Setup of Table Press Machine (High Accuracy Locating + Clamping)

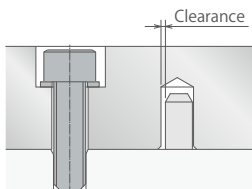
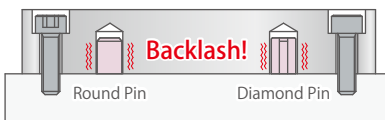
Model SWQ / SWT / VXE / VXF Air Location Clamp / Screw Locator

General Fixed Pin

Manual Tightening
Accuracy Correction Required

Table Press Machine

Upper Die (No Setup Change)



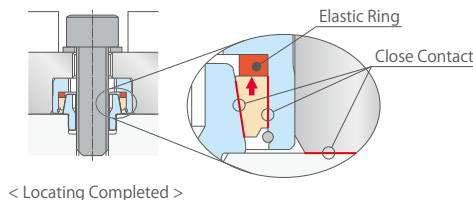
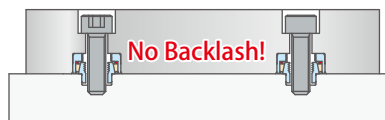
Unreliable Accuracy and Repeatability due to Clearance
Hard to Load • Easy to Get Stuck
Manual Tightening

Screw Locator

No Accuracy Correction Required
(Manual Tightening)

Table Press Machine

Upper Die (No Setup Change)



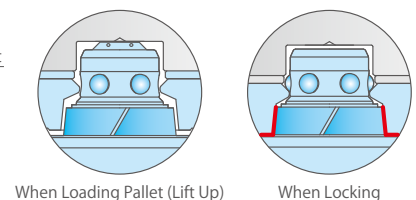
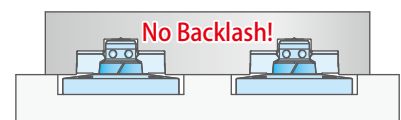
3 μ m Locating Repeatability
Easy Loading/Unloading with Taper Pin
Manual Tightening

Air Location Clamp

Locking in Mere Seconds
No Accuracy Correction Required

Table Press Machine

Upper Die (No Setup Change)



3 μ m Locating Repeatability
Drastic Reduction of Setup Time
Suitable for Automation

Productivity and Quality Improvement with High Accuracy Setup

Setup time can be drastically reduced with pallet clamp that locates with high accuracy (locating repeatability) and clamps simultaneously for high accuracy locating of lower die. When clamping by manual tightening, screw locator can be used for high accuracy locating (locating repeatability: 3 μ m).

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, Tokyo-Mitsubishi bank, Ikeda bank

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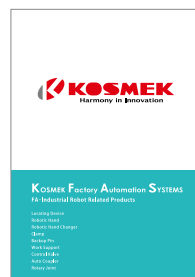
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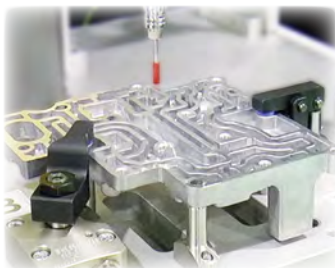
For further information of each product, please refer to
"FA • Robotic Automation Products Complete Catalog".
Please contact us or request it from our website.



FA • Robotic Automation Products
Complete Catalog
Catalog No. FA0020□-□-GB

Product Line-up

We have various types of hydraulic and pneumatic products. Please let us know your requirements, and we will make it happen.



KOSMEK WORK CLAMPING SYSTEMS

MACHINE TOOL RELATED PRODUCTS



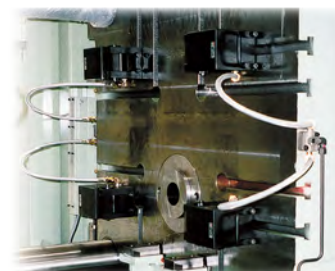
QUICK MOLD CHANGE SYSTEMS

FOR INJECTION MOLDING MACHINES



QUICK DIE CHANGE SYSTEMS

FOR PRESS MACHINES



DIECAST CLAMPING SYSTEMS

FOR DIECAST MACHINES

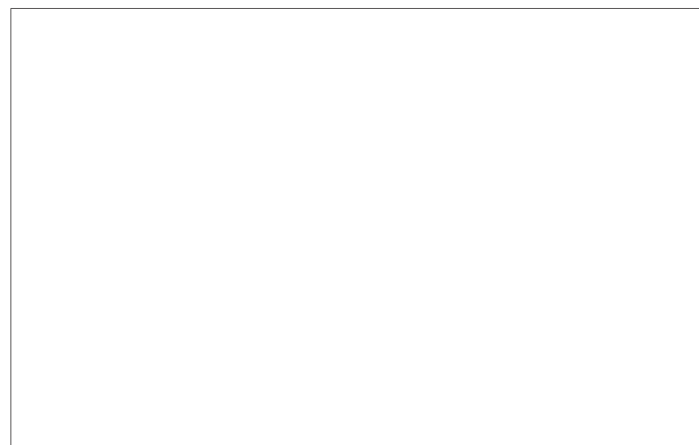


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► <http://www.kosmek.com/>

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- Specifications in this Leaflet are Subject to Change without Notice.

