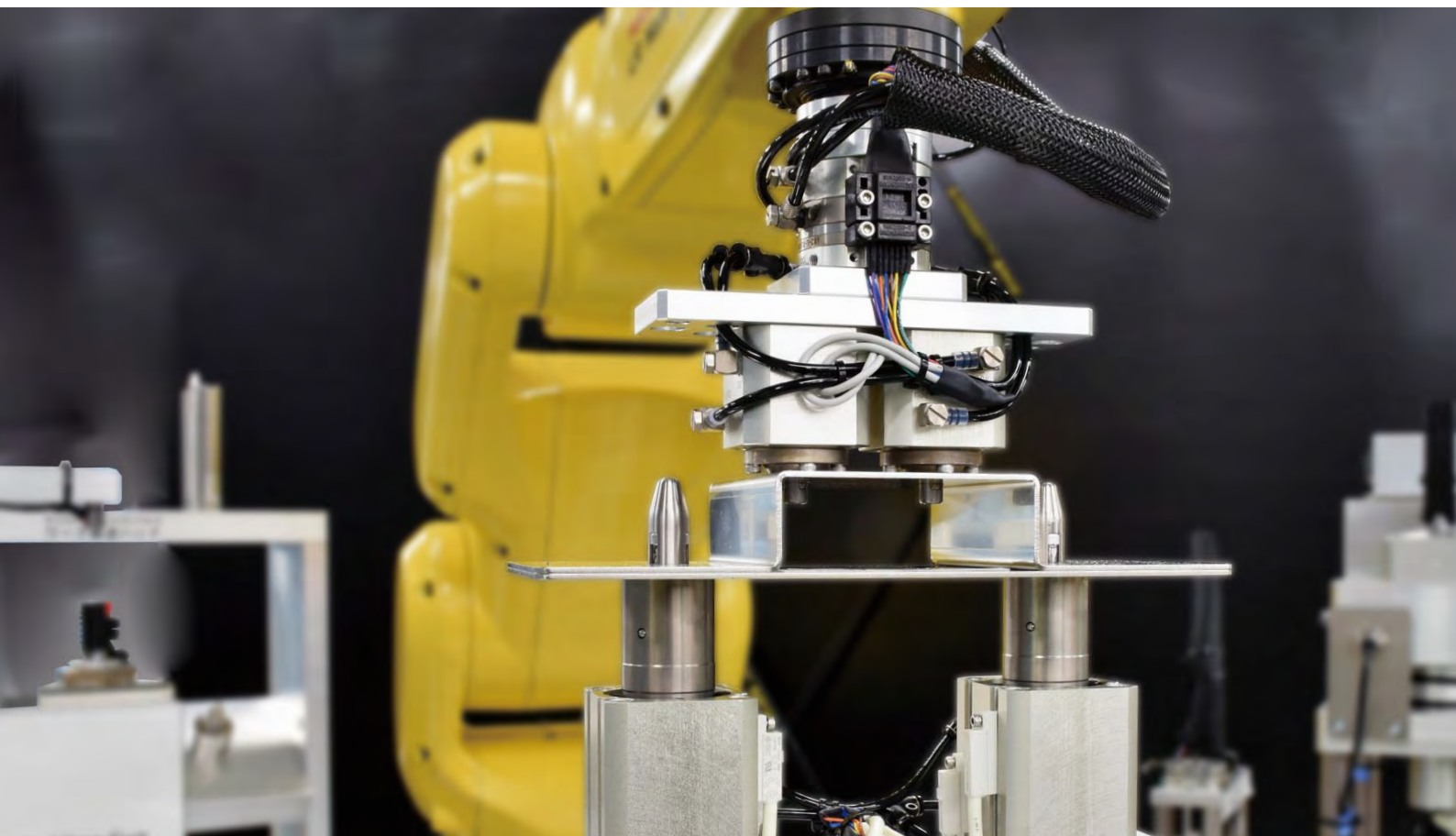


KOSMEK Welding Product Application Examples

Special Edition

For setup improvement of welding applications





Introducing Kosmek



NEW model WVG
**High-Power
Automation Pallet Clamp**
Low-profile Pallet Clamp suitable for
pallet change of welding fixtures.



**Pin Head Floating Model
Newly Added**

New Lineup model SWP
Locating Pin Clamp
Pin Head Floating Model and
Smaller Hole ($\phi 8$, $\phi 9$) Applicable Model
are newly added to the lineup.



Welding Products



model WCG
**High-Power
Welding Link Clamp**



model WHG
**High-Power
Welding Swing Clamp**



model SWR
Robotic Hand Changer

New Option
Ground Electrode



model WVS
**High-Power
Pneumatic Pallet Clamp**



model JV□
Auto Coupler



model VXF
Screw Locator

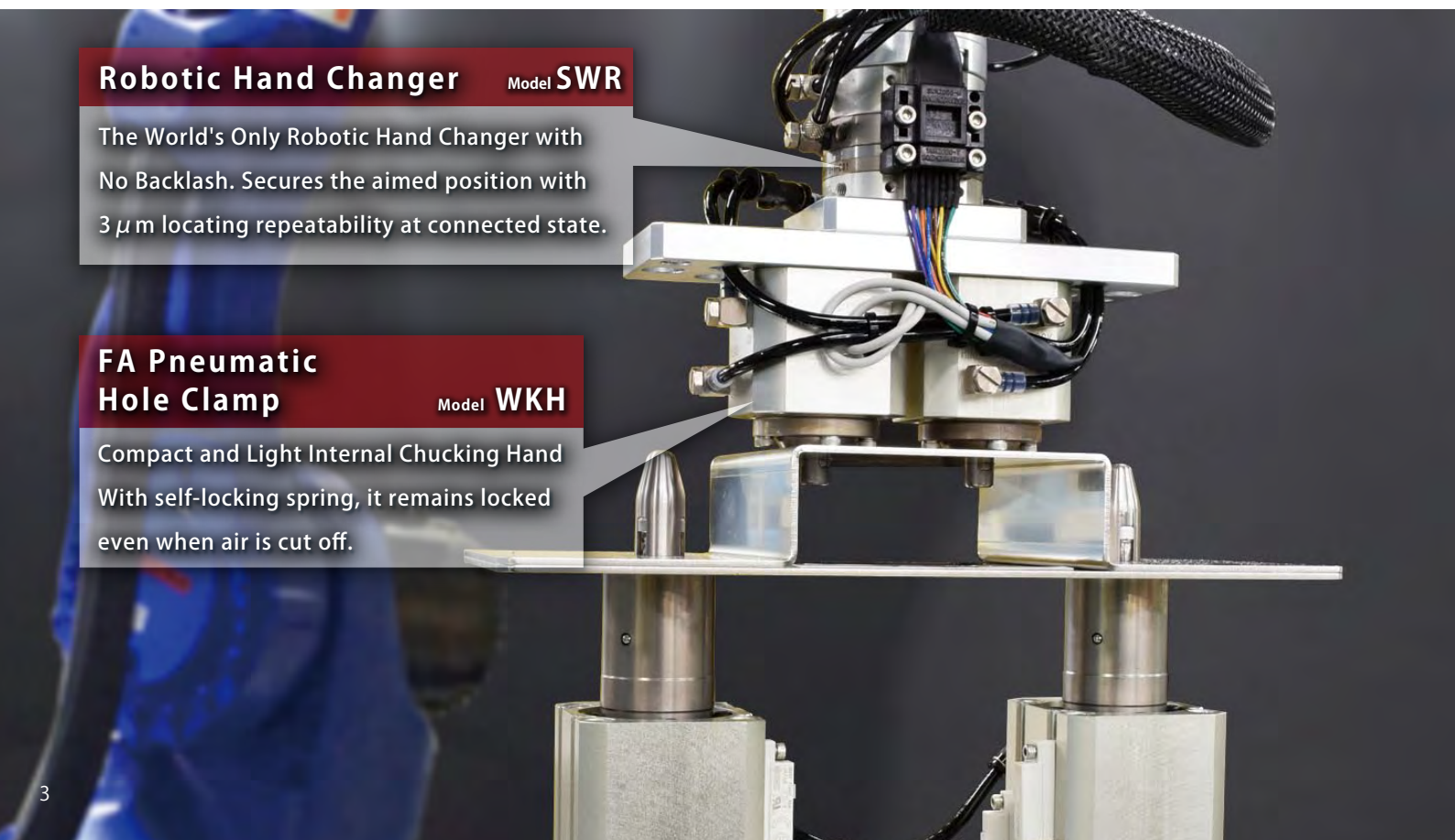


Locating Pin Clamp

Model **SWP**

Expansion of the locating part allows for high-accuracy locating and clamping of thin workpieces. Floating model (without locating function) is added to the lineup.

Spot Welding



Robotic Hand Changer

Model **SWR**

The World's Only Robotic Hand Changer with No Backlash. Secures the aimed position with $3\ \mu\text{m}$ locating repeatability at connected state.

FA Pneumatic Hole Clamp

Model **WKH**

Compact and Light Internal Chucking Hand
With self-locking spring, it remains locked even when air is cut off.

High-Power Welding Swing Clamp

Model **WHG**

Spatter-Resistant High-Power Pneumatic Swing Clamp for Welding Application. Special rod coating and triple protective structure prevents contamination.

High-Power Welding Link Clamp

Model **WCG**

Spatter-Resistant High-Power Pneumatic Link Clamp for Welding Application. Special rod coating and single link plate allow for spatter resistant. Triple protective structure prevents contaminants from entering the cylinder.

Arc Welding

Location Clamp

Model **SWQ**

For Pallet Exchange Automation. Enables simultaneous clamping and locating with 3 μ m locating repeatability

Auto Coupler

Automatically connects air circuits to provide the air pressure to the pallet when the location clamp is locked.

Kosmek Welding Product Application Examples

Special Edition

Our highly durable products aimed at fixture automation, high accuracy and space saving are introduced for welding applications. These are application examples of our products designed from customer's requirement to achieve "Welding Automation", "Quality Improvement for Welding", "Space-Saving of Applications", and "Simplify Maintenances in Developing Country".



Setup and Pallet Change of Welding Fixture

High-Power Automation Pallet Clamp / Screw Locator

P.7



High-Accuracy Locating and Clamping of Workpieces

Locating Pin Clamp

P.9



Spatter-Resistant Link (Swing) Clamp

High-Power Welding Link Clamp / Swing Clamp

P.11



High-Temperature Measurement : Locating Cylinder with Outer Cylinder

【Custom-Made】 Expansion Locating Pin

P.15



Locating the Thread Part of Workpiece with Nut

【Custom-Made】 Offset Locating Cylinder

P.16

Note

The environment as well as temperature and/or spatter measurement have to be carefully considered for using our products for welding. The examples in this brochure are designed for certain environments and it cannot be used in every case. Please contact us for designing.



No Manual Tightening Required. Clamping with Pull Bolt
【Custom-Made】 Ball Lock Clamp (Pull Stud Clamp)

P.17



Use Minimal Amount of Oil: Spring Swing Clamp
【Custom-Made】 Spring Swing Clamp

P.18



For Prevention of Welding Distortion
Swing Clamp

P.19



Detaching from Hydraulic Source :
 Reduce the Number of Hydraulic Circuits of Positioner
Non-Leak Valve

P.20

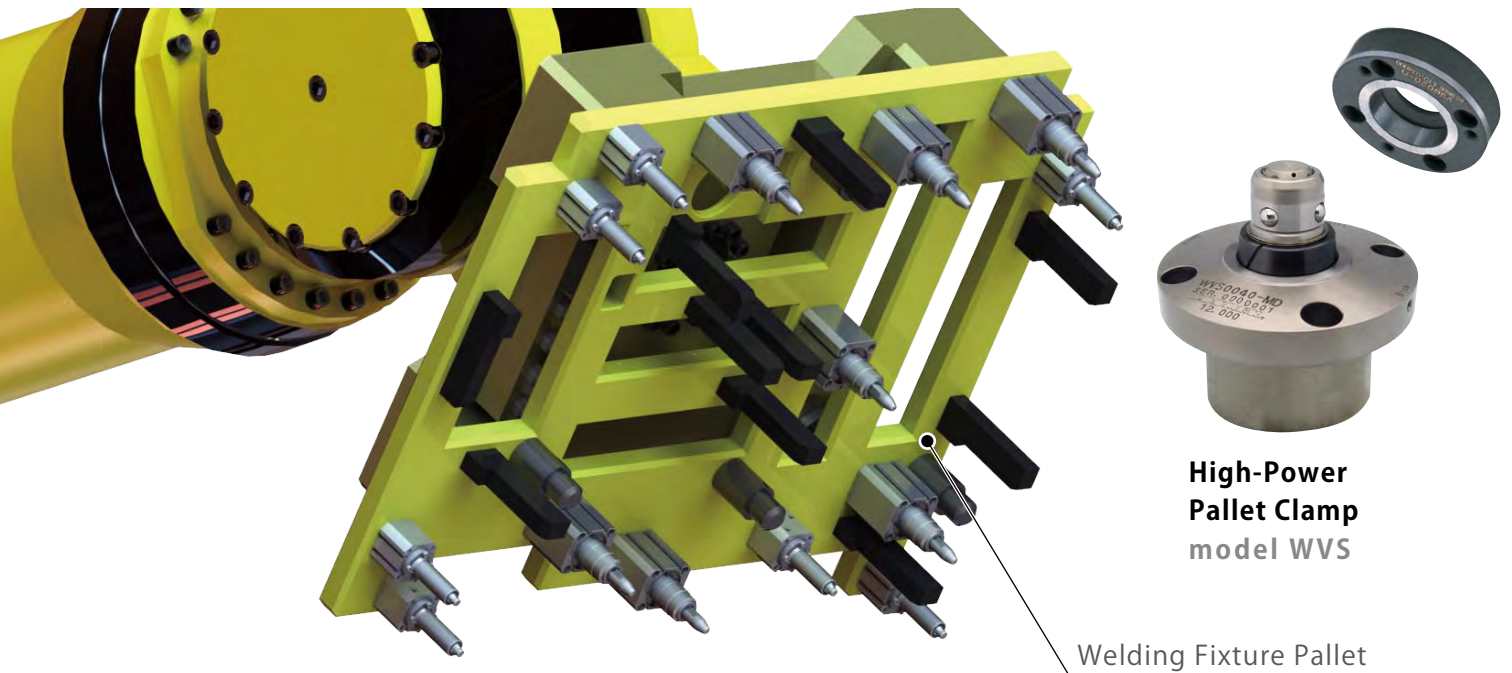


Secures the Aimed Position with 3 μ m Repeatability
Robotic Hand Changer

P.21

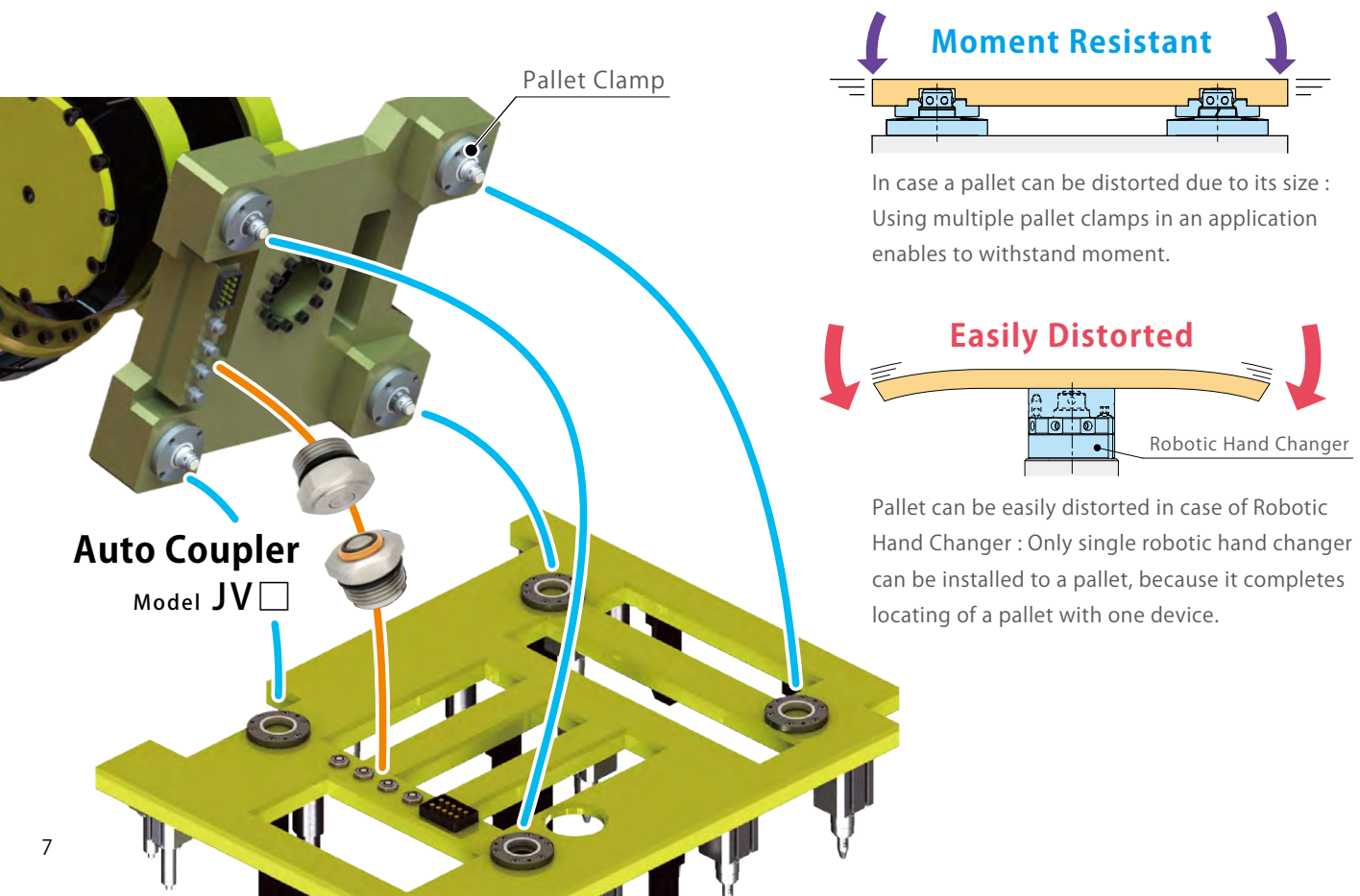
Welding Fixture • Pallet Change

Pallet Clamp



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 μ m locating repeatability enables high-accuracy pallet change and setup time reduction.



High-Speed Setup of Positioner

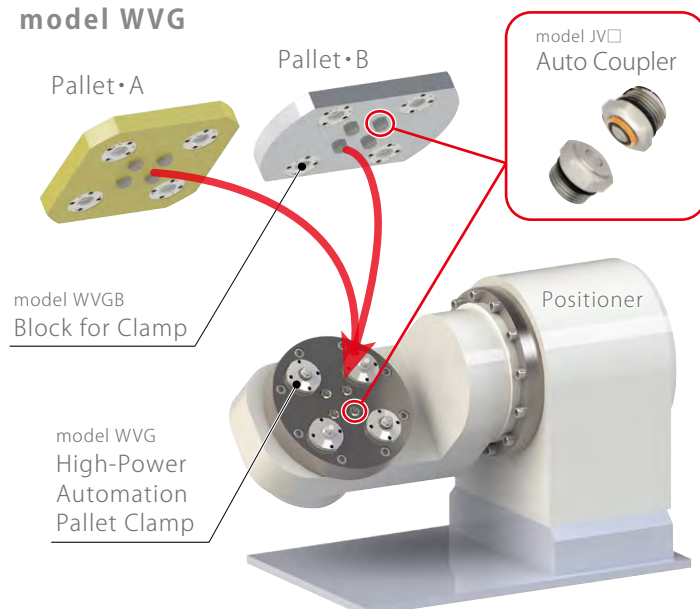
High-Power Automation Pallet Clamp / Screw Locator



High-Power Automation Pallet Clamp enables simultaneous locating and clamping of a fixture/pallet on a positioner. This reduces setup time leading to productivity improvement. WVG has an air blow function to prevent contamination. VXF enables manual locating for pallet exchange.

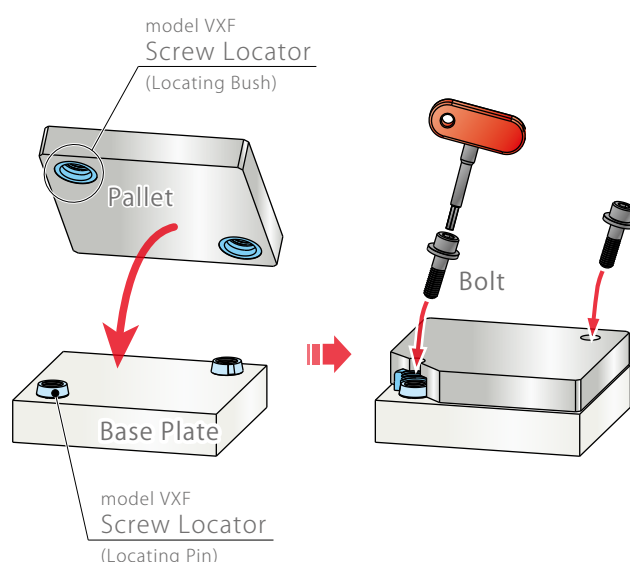


High-Power Automation Pallet Clamp model WVG



Fixture Setup on the Positioner

Screw Locator model VXF



Manual Pallet Change

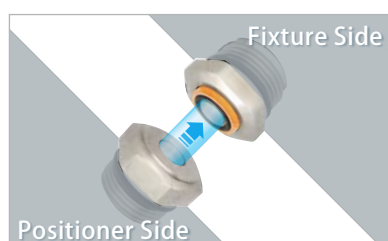
Automating Air Supply to Pallet on Positioner

Auto Coupler

Model JV□ / JT□

Compact Coupler to Connect Fluid Circuits

Connection Stroke : 1mm Commonly Used with High-Power Automation Clamp, Location Clamp and Screw Locator



High-Accuracy Locating and Clamping

Locating Pin Clamp



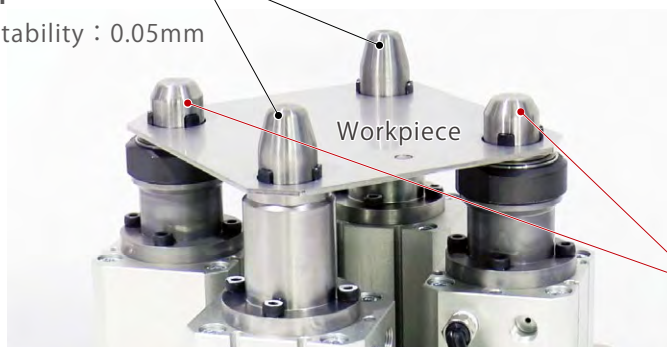
model SWP

Using workpiece holes, the Locating Pin Clamp locates and clamps a thin workpiece. With longer pulling stroke, this model is applicable to various workpiece thicknesses, and thus best suitable for workpieces of spot welding applications. Equipped with air blow function to prevent contamination and auto switch for action confirmation, you can safely use the Locating Pin Clamp for automated applications.

Locating Pin Clamp

Locating Model

Locating Repeatability : 0.05mm



High-Accuracy Locating and Clamping of Workpiece

NEW

Locating Pin Clamp

Floating Model

Pin Head Floating Amount

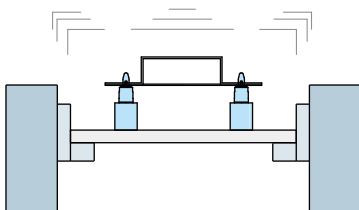
SWP0501 : $\pm 0.6\text{mm}$

SWP1001 : $\pm 0.8\text{mm}$

Application Examples

Positioner

More Compact

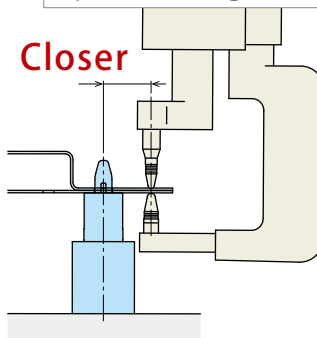


Less Load to Positioner

Light fixture with light Locating Pin Clamp reduces load to the positioner.

Spot Welding Gun

Closer

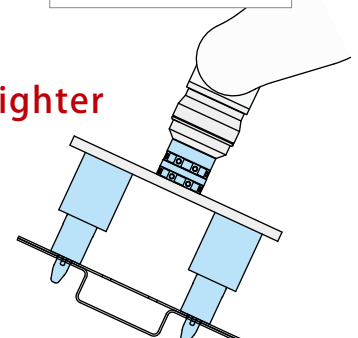


High Accessibility of Spot Gun

Compact Locating Pin Clamp enables high accessibility of spot welding gun to a workpiece hole.

Transfer Robot

Lighter



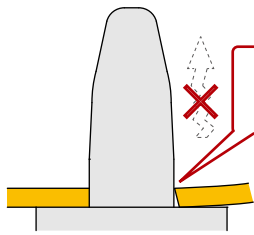
Compact/Light Transfer Hand

Compact and Light Locating Pin Clamp is also suitable for transferring thin plates.

KOSMEK Locating Pin Clamp for Welding

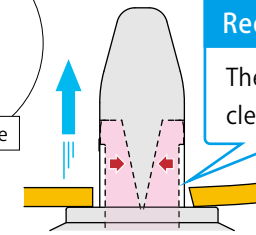
Three Remarkable Advantages

Work Efficiency



Unable to pull out the workpiece because of welding distortion.

Standard Pin Clamp

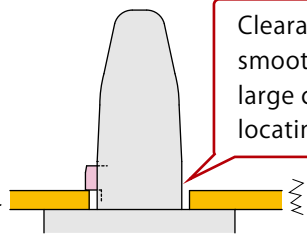


Reduce the Risk of Machine Stop

The retracted gripper allows enough clearance for smooth unloading.

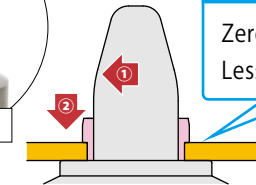
KOSMEK Locating Pin Clamp

Stable Clamping



Clearance needs to be large for smooth loading/unloading, but large clearance leads to poor locating accuracy...

Standard Pin Clamp

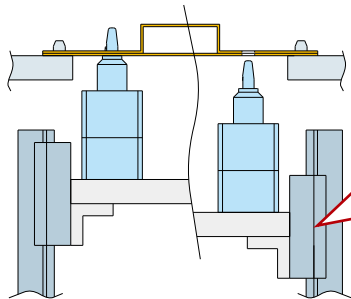


Stable Production

Zero clearance when gripper expanded. Less defects with high-accuracy locating!

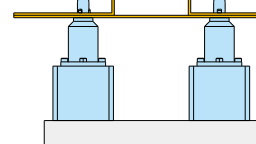
KOSMEK Locating Pin Clamp

Reduce Fixture Cost



Lifting device may be required to pull out the stuck workpiece due to welding distortion.

Standard Pin Clamp



Simplified Application

Smooth loading/unloading enables to reduce fixture cost.



KOSMEK Locating Pin Clamp

Action Description

RELEASE

Release Air ☒ ON

Lock Air ☐ OFF

LOCK

Release Air ☐ OFF

Lock Air ☒ ON



Workpiece Loading/Unloading

Gripper is retracted. A workpiece can be smoothly installed due to an adequate space between the workpiece hole and the pin.



① Locating Action

Gripper expands to locate the workpiece.



② Locking Action

Gripper pulls in the workpiece after locating, and clamping part pulls the workpiece onto the seating surface for locking.

Spatter Resistant

Non-clearance prevents spatter from entering.

Spatter-Resistant Link (Swing) Clamp

High-Power Welding Link Clamp / Swing Clamp



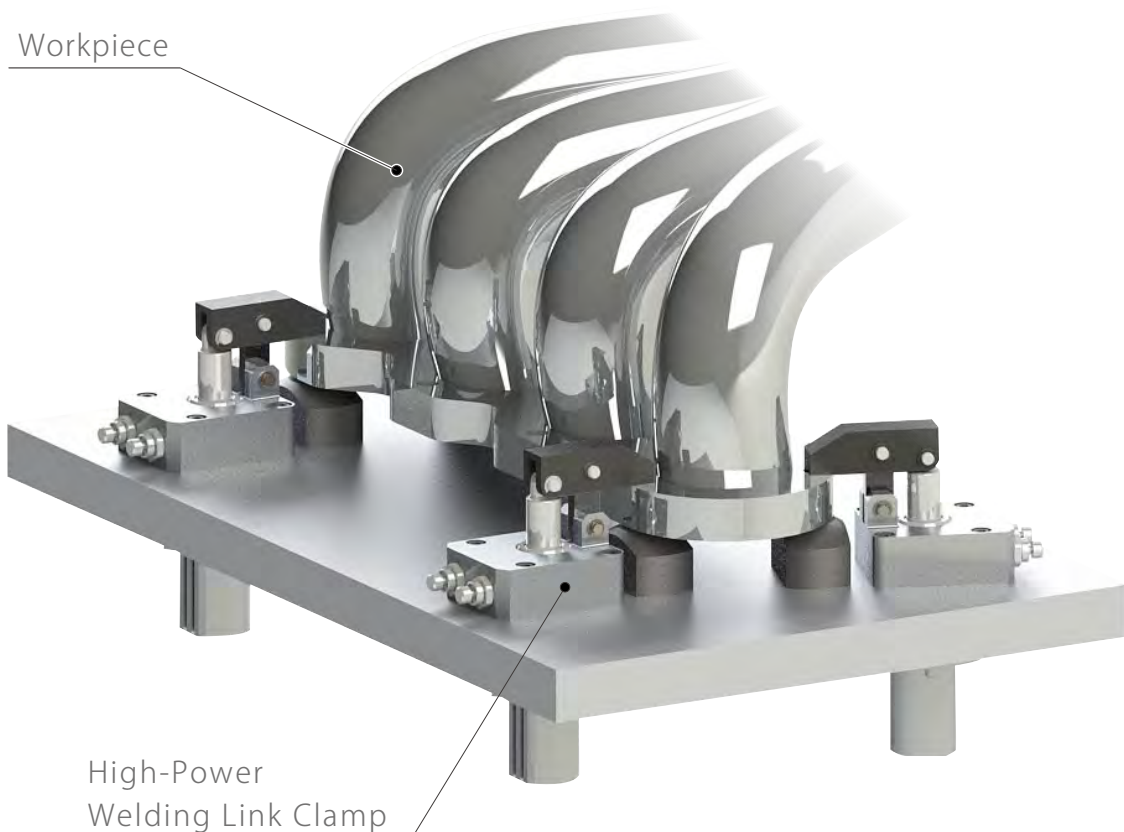
model WCG/WHG

Welding Link Clamp with high durability designed for spatter prevention.

(Welding Swing Clamp is also available.)

Suitable when it is difficult to control spatter scattering position or to install a protection cover such as arc welding of a whole workpiece.

It can also have an auto switch installed for action confirmation.



Exhaust Manifold Welding Fixture

Features

- Triple protective structure prevents contaminants from entering the cylinder.

Special Rod Surface Finishing

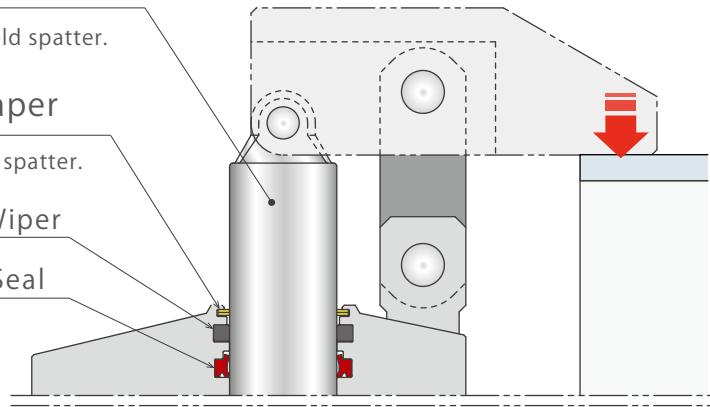
Protects body surface from weld spatter.

Coil Scraper

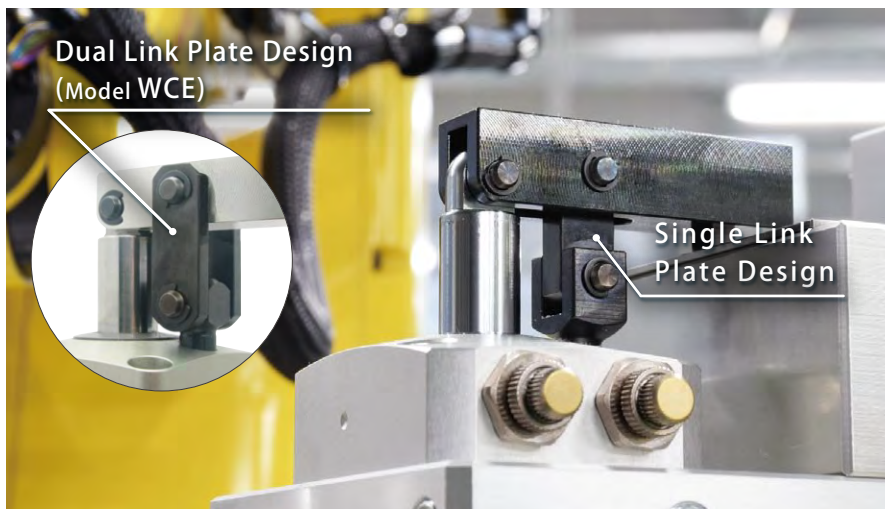
Removes weld spatter.

Soft Wiper

Dust Seal

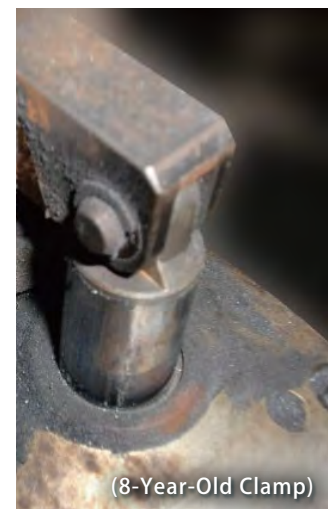


- Single link plate design prevents spatter adhered to the link mechanism part.



Spatter Resistant

Compared to dual link plate design (model WCE), the link mechanism of Welding Clamp is designed to be spatter resistant with single link plate.



Case Study

The rod operates without failure even after exposed to spatter for a long time.

Auto Switch

(Prepared by customer)

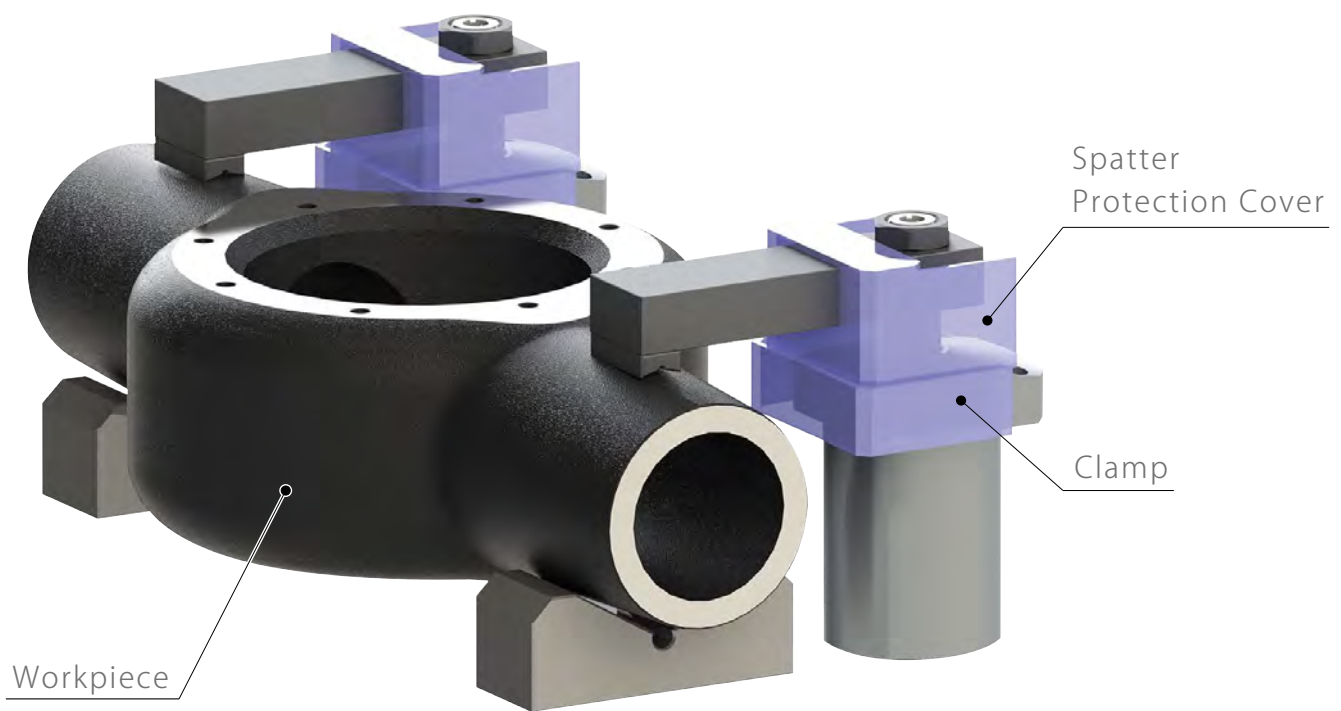


Auto switch enables to confirm lock action and release action.

Standard Clamp + Anti-Spatter Equipment

High-Power Pneumatic Link Clamp / Swing Clamp

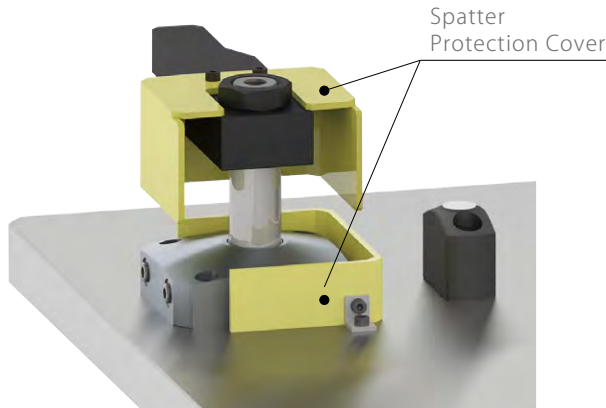
- Clamp can be damaged by spatter in welding applications.
- This is an example of welding spatter measurement designed with Kosmek standard clamps and customer's fixture equipment. It is also suitable for spatterless FSW•FSJ, etc.
- There are various advantages of installing high-power pneumatic clamp including cost reduction, short lead time, compact body and space-saving with powerful clamping force.



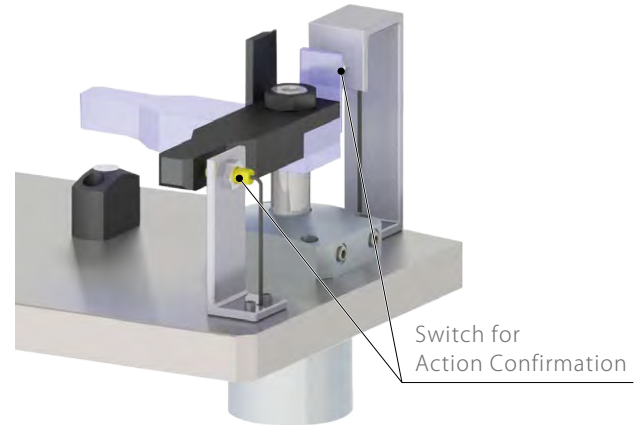
Axle Housing Welding Fixture

Welding Jig Installation Sample for Standard Clamp

Prevents spatter to the clamp with the protection cover.



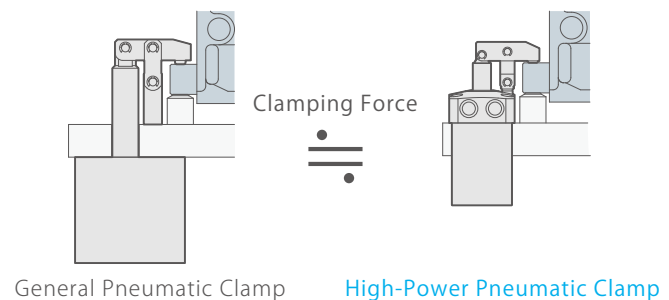
When action confirmation is required.



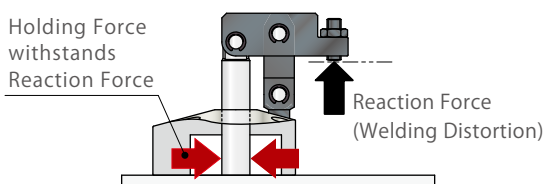
Advantages of Introducing High-Power Pneumatic Clamp

Space-Saving

Exerts three times clamping force compared to the same size general air cylinder.
Compact cylinder enables smaller footprint and cost reduction of fixture.

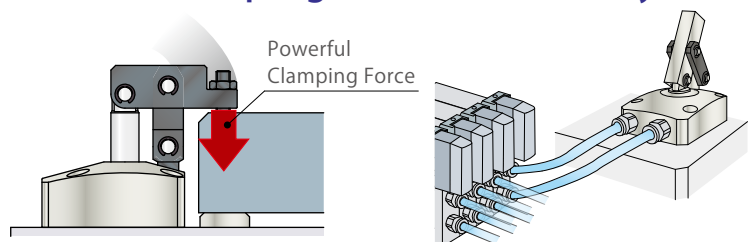


Holding Force



Holding force exerts 3 times the clamping force at most to withstand the reaction force.

Powerful Clamping Force without Hydraulic Use



High-power welding clamp exerting equivalent force to hydraulic clamp needs no hydraulic pressure use.



High-Power Pneumatic
Swing Clamp / Link Clamp
model WHE/WCE



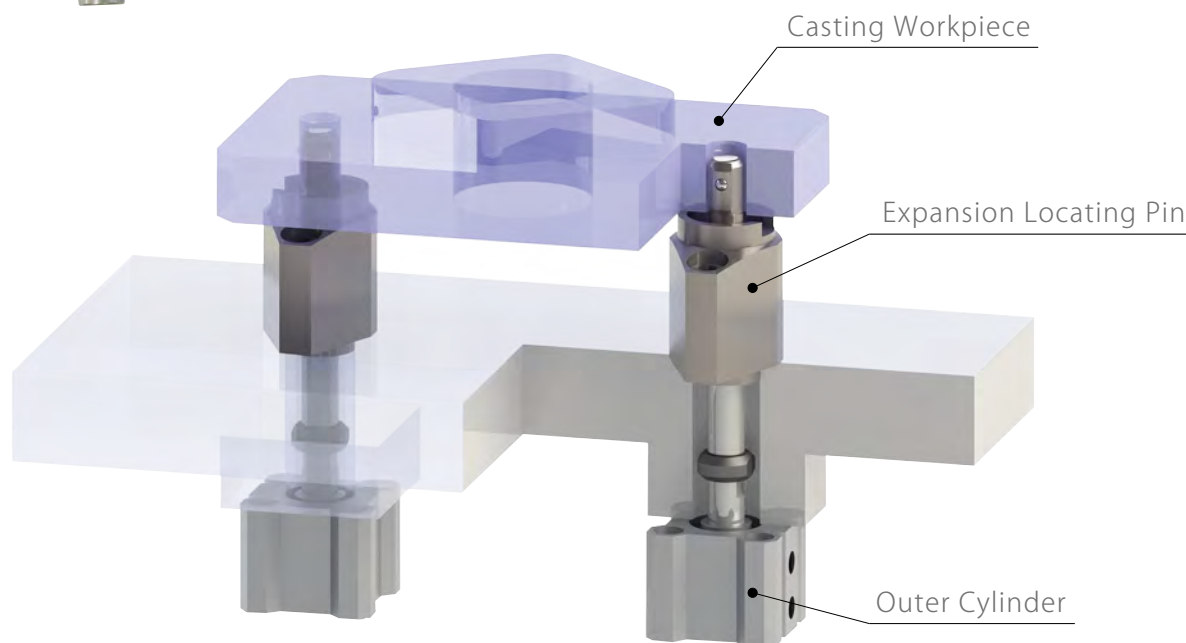
High-Power Welding
Swing Clamp / Link Clamp
model WHG/WCG

Locating Cylinder for High Temperature

[Custom-Made] Expansion Locating Pin

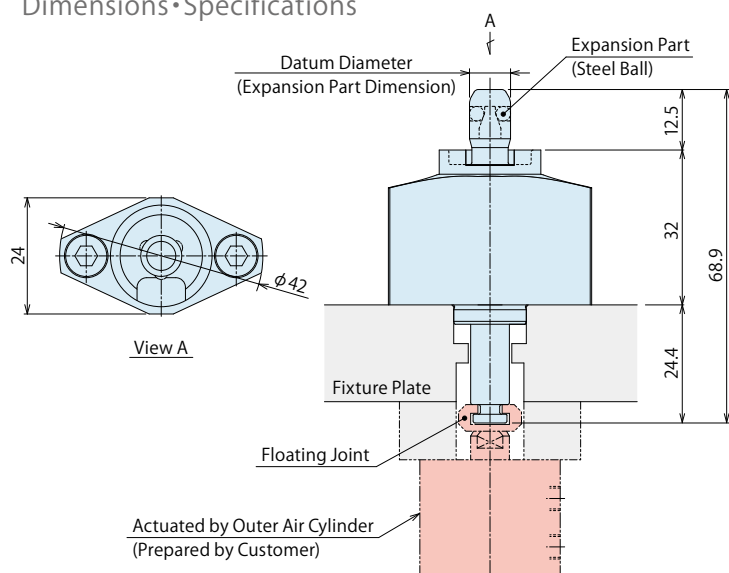


- If the distance of a welding point and expansion locating pin is short, the sealing inside the cylinder can be damaged by heat.
- This is the example of high temperature measurement by placing another cylinder under the fixture.



Locating the Casting Workpiece (Expansion locating pin is only for locating and has no clamping function.)
Prepare another clamp for holding a workpiece.

Dimensions•Specifications



Model No. (Please contact us.)		Custom-Made Expansion Locating Pin
Workpiece Hole Diameter	mm	φ 8.5 ~ 9.5
Locating Repeatability ※1	mm	0.01
Datum	At Release (Max.)	φ 8.48 or less
Diam. mm	At Full Stroke (Min.)	φ 9.5 or more

Notes:

1. This product is only for locating and has no clamping function. Prepare another clamp for holding a workpiece.
2. This product locates and releases with a double-acting air cylinder.

※ 1. Locating Repeatability under Specific Condition (No Load)

Locating the Thread Part of Workpiece with Nut

[Custom-Made] Offset Locating Cylinder

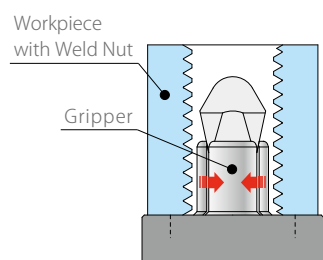


This product is a locating cylinder that clamps the nut thread part of a workpiece with a welding nut to locate and hold the workpiece. Air blow function to prevent contamination is also available.



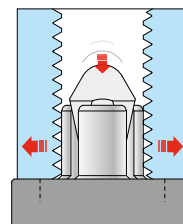
Locating a Workpiece with Weld Nut

Action Description



【Released State】

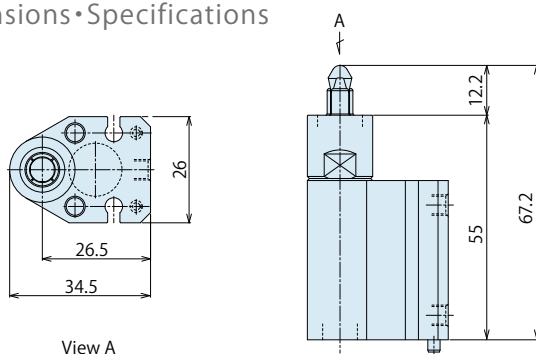
Gripper is retracted.
Load/Unload the panel.



【Locked State】

Gripper expands to clamp
the thread part.

Dimensions・Specifications



View A

Model No. (Please contact us.)	Custom-Made Offset Hole Clamp	
Workpiece Hole Diameter	mm	6.8 ±0.3
Locating Repeatability ※1	mm	0.03
Expanding Force (at 0.4MPa)	N	120
Operating Pressure Range	MPa	0.4 ~ 0.5
Operating Temperature	℃	0 ~ 70
Usable Fluid	Dry Air	
Air Blow Function	Yes	
Auto Switch Installation Slot	Yes	

Note:

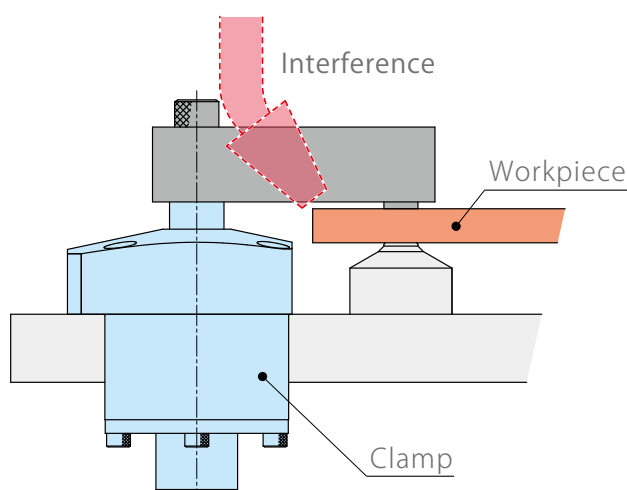
※ 1. Locating Repeatability under Specific Condition (No Load)

Clamping with Pull Bolt

【Custom-Made】 Ball Lock Clamp (Pull Stud Clamp)

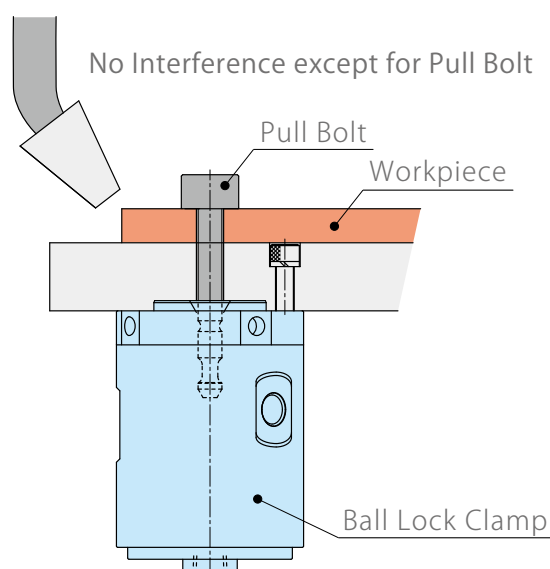


- Workpiece setup is completed by setting the pull bolt and clamping.
- Just like bolt tightening, there is no interference around the workpiece and it improves work efficiency.
- This clamp is set under the fixture where spatter does not scatter around.



Set the Clamp Outside

Interfere with the clamp.

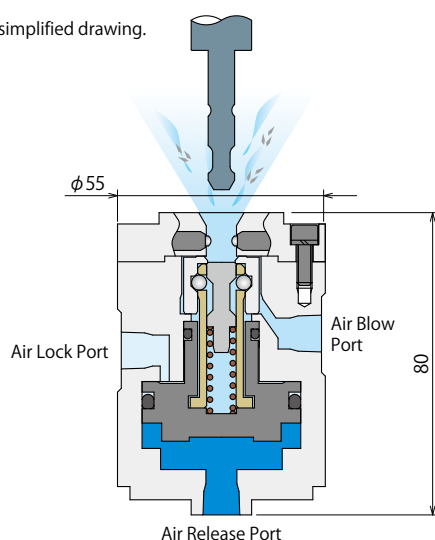


Ball Lock Clamp

Minimal Interference

Internal Structure • Dimensions • Specifications

※ This is a simplified drawing.



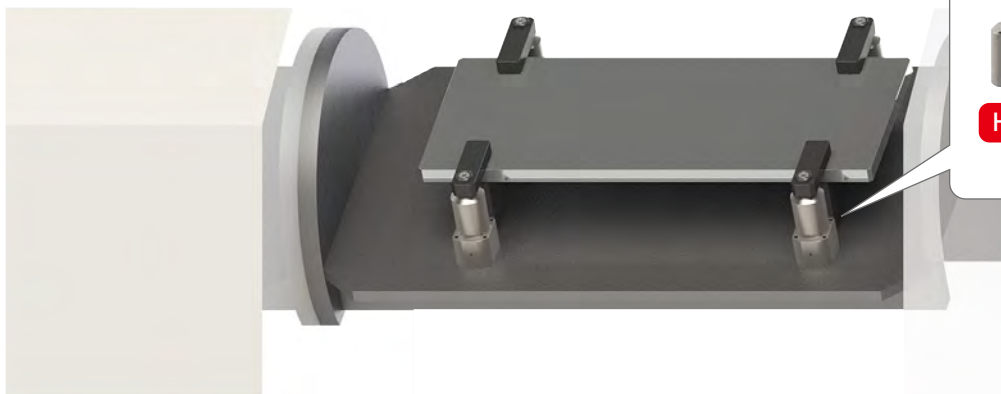
Model No. (Please contact us.)		Custom-Made Ball Lock Clamp
Clamping Force (at 0.4MPa)	kN	0.43
Full Stroke	mm	6.7
Lock Stroke	mm	3.8
Cylinder Area cm ²	Lock	10.7
	Release	13.9
Sleeve Return Spring Force	N	5.0
Allowable Offset	mm	±0.5
Operating Pressure	MPa	0.40 ~ 0.45
Operating Temperature	°C	0 ~ 70°C
Usable Fluid		Dry Air

Use Minimal Amount of Oil: Spring Swing Clamp

【Custom-Made】 Spring Swing Clamp

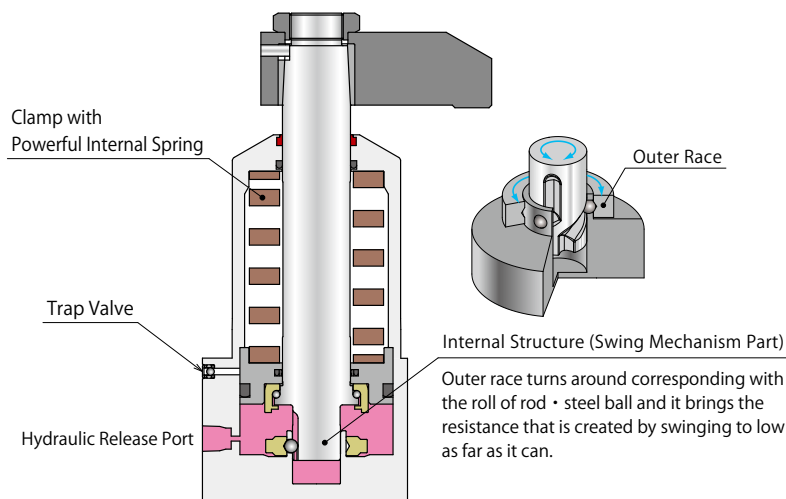


- Spring Swing Clamp is designed for when a hydraulic clamp is required for powerful clamping force, but not supplying pressure during activation and welding for safety. It locks with an internal spring and supplies pressure only when changing workpieces (releasing).
- With higher safety, it is also suitable for detaching from hydraulic source.



Clamping Large Workpiece on the Positioner at 0MPa Hydraulic Pressure

Internal Structure • Dimensions • Specifications



Model No. (Please contact us.)		Spring Swing Clamp
Full Stroke	mm	13.5
Swing Stroke	mm	7.5
Clamping Force (Lever Length=200mm)	kN	About 5.5 ~ 8.1 ±10%
Release Pressure	MPa	5
Operating Temperature	°C	0 ~ 70°C
Usable Fluid		ISO-VG-32 or Equivalent

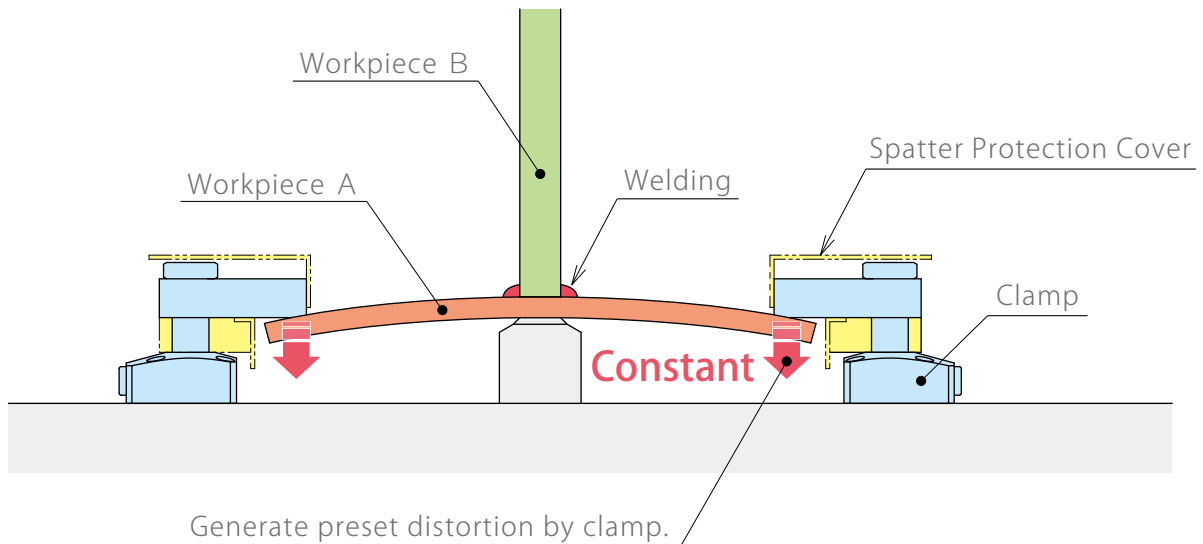


For Prevention of Welding Distortion

Swing Clamp

- Predict the deformation amount (welding distortion) caused by heat of the arc welding, and generate preset distortion to reduce the welding distortion of the product. Automatic clamp is able to apply constant clamping force. Also, high-power clamp has holding force.

※ Distortion amount has to be calculated and designed by customer.



High-Power Hydraulic Swing Clamp
model LHE

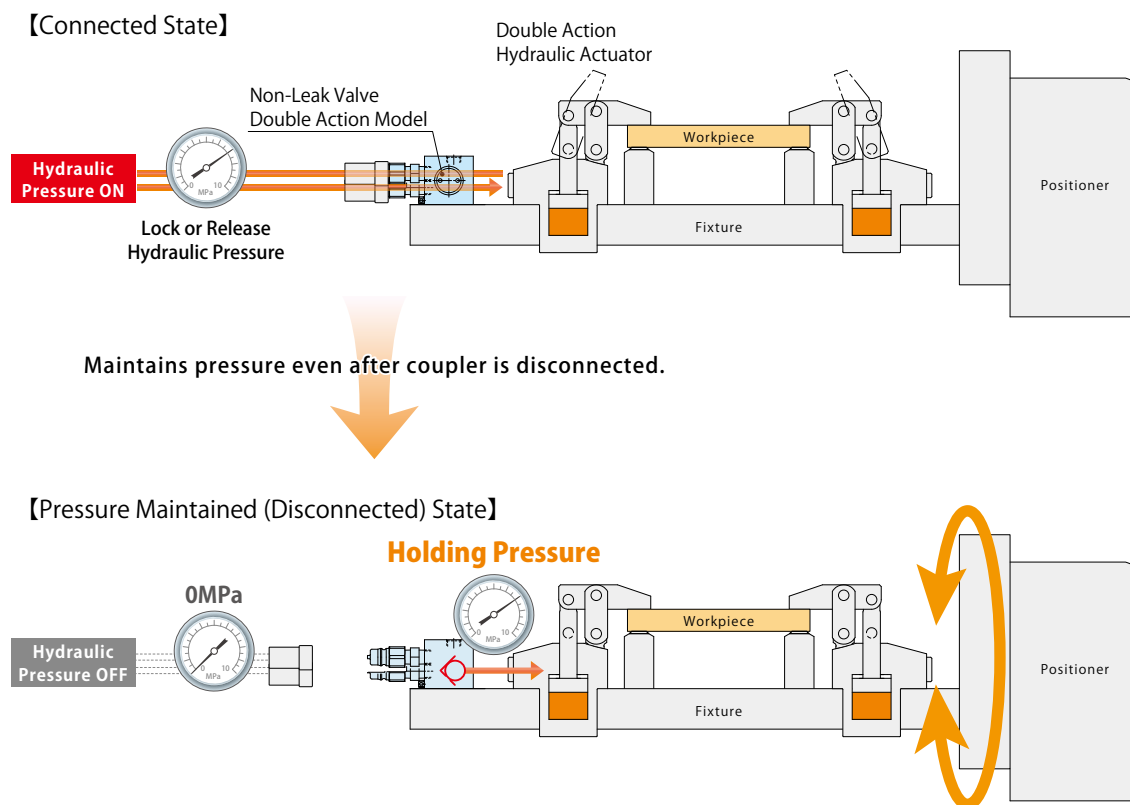


High-Power Pneumatic Swing Clamp
model WHE

Detaching from Hydraulic Unit Reduces the Number of Circuits of Positioner

Non-Leak Valve

- This is the example of supplying hydraulic pressure to the fixture on the positioner from the outside, not by using circuits inside the positioner.
- Install Non-Leak Valve (model BEQ) on the fixture, connect a hydraulic hose when setting, and activate the clamp.
- After setting, remove the hose from Non-Leak Valve and the equipment can be operated with hydraulic pressure remained in the fixture. If temperature change of the fixture is severe and pressure fluctuation is large, use accumulator (model JSS/JS) to absorb pressure fluctuation.



Non-Leak Valve (Hydraulic Double-Acting Model)
model BEQ



Accumulator
model JSS / JS

The World's Only Robotic Hand Changer with Zero Backlash



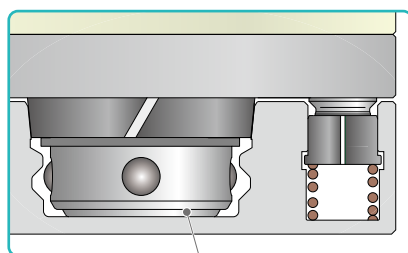
Model **SWR**

Air Lock / Air Release

Self-Locking Function with Spring

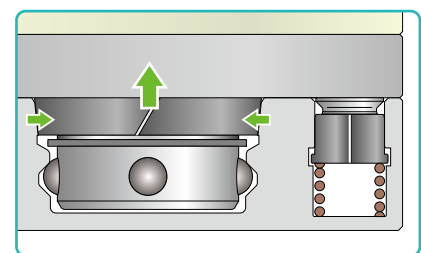
KOSMEK Exclusive Non-Backlash Mechanism

Before
Connected



Detaching Function

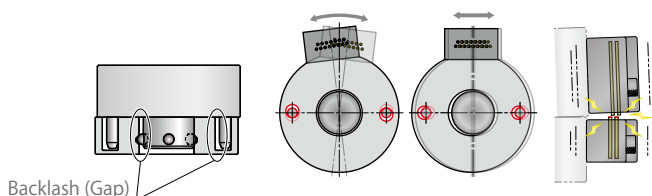
When
Connected



Zero-Backlash Connection with Dual Contact

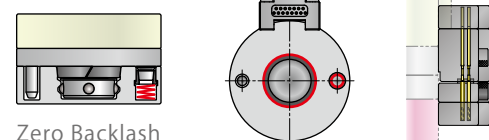
Backlash of a Tool Changer Causes Electrode Errors
Noise and Continuity Failure due to Friction of Contact Probe

Kosmek Hand Changer with No Backlash
Prevents Electrode Errors
No Noise Occurs



Continuity Failure of Electrode

Frequent Moment Stop



Zero Backlash

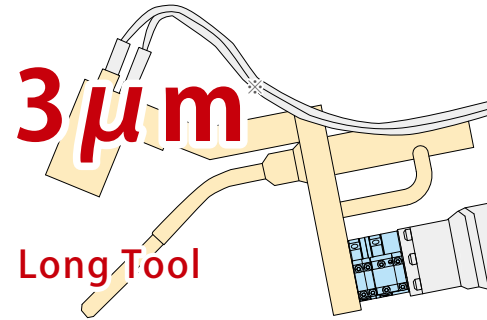
No Continuity Failure of Electrode

Sharp Decline of Moment Stop

Secures the Aimed Position Repeatability when Connected is

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

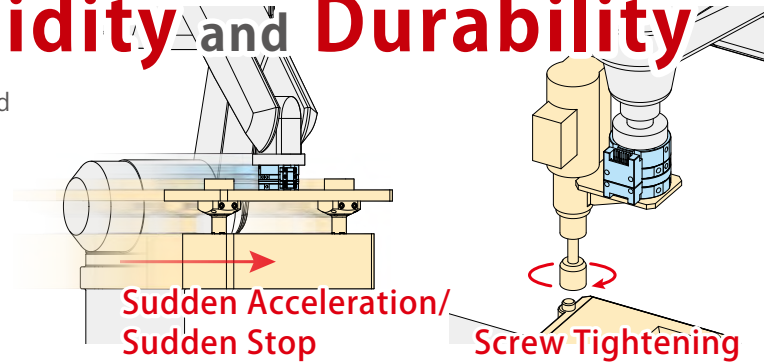
※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of 5 μ m.



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 μ m repeatability even after 1 million cycles.



A Variety of Electrode Options Available

NEW

Ground Electrode

Please contact us for details.

Rated Capacity 400A (Activity 50%)

Only for SWR0500 or larger models.



- Resin Connector Electrode
- 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)
- Compact Electric Power Transmission (Ability to Transmit AC/DC200V 5A)
- Power Transmission Option (Connector Based on MIL-DTL-5015)
- High Current Transmission Option (Connector Based on MIL-DTL-5015)
- Waterproof Electrode (Noncontact Waterproof) IP67 Compact Model
- Waterproof Electrode (Noncontact Waterproof) IP67
- Air Joint (3 Port Option • with Larger Port : ϕ 6)
- Air Joint (2 Port Option)
- Air Joint (4 Port • Solder Terminal Extensible Option)



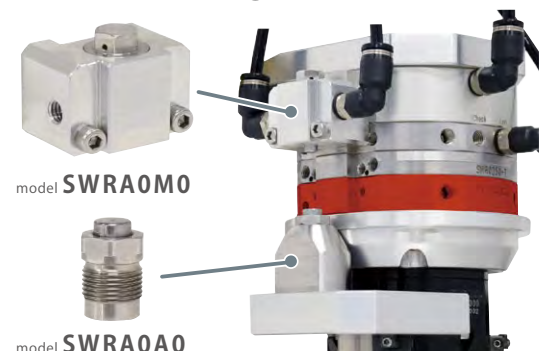
Prevent Operating Errors during Robot Teaching

Safety Push Valve

Prevent a Tool Fall of Robotic Hand Changer during Robot Teaching

Able to mount directly on Robotic Hand Changer (Model SWR), and prevent a tool fall caused by a valve operating error.

Enables to limit the robotic hand changer to release only at a designated position (tool stocker).



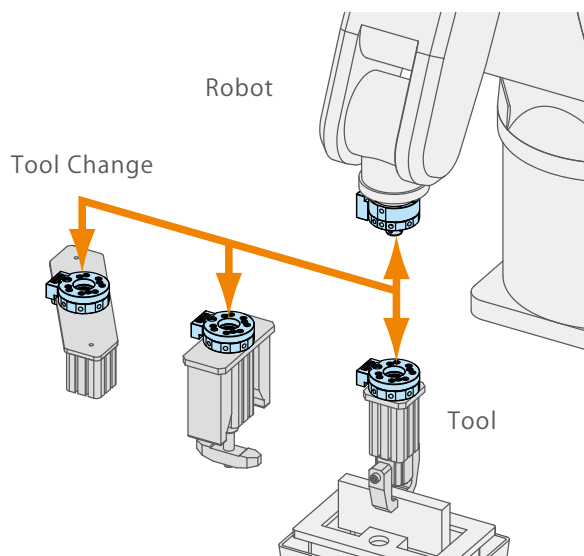


FA • Robotic Automation

Factory Automation
Industrial Robot Related Products

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

For Standardization of Robots/Heavy Load Work



Robotic Hand Changer
model SWR



Robotic Hand
model WPA / WPE / WPF / WPH /
WPJ / WPP / WPQ / WPS



FA Pneumatic Hole Clamp
model WKH



Ball Lock Cylinder
model WKA



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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.

