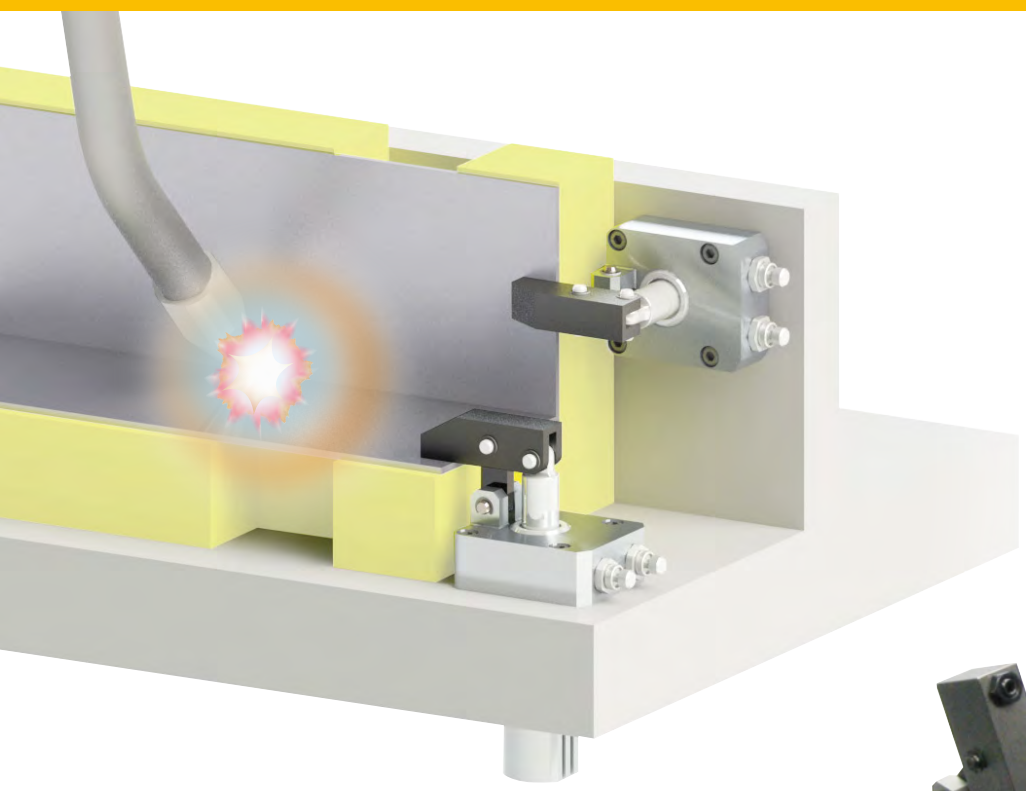
KOSMEK SPECIAL PRODUCTS for WELDING

Welding Equipment Application Examples

Automation Clamps • Setup Improvement Products



KOSMEK
Harmony in Innovation

Welding Application Examples

KOSMEK SPECIAL PRODUCTS for WELDING

Our highly durable products aimed at fixture automation, high accuracy and space saving are introduced for welding equipment. 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".

Standard Clamp + Anti-Spatter Equipment Examples

High-Power Pneumatic Swing Clamp / Link Clamp P.3

Anti-Spatter Link (Swing) Clamp Examples

【Custom-Made】Anti-Spatter Link/Swing Clamp P.5

Locating and Clamping of Panels with Various Thicknesses

【Custom-Made】Hole Clamp P.7

Clamping the Thread Part of Workpiece with Nut

【Custom-Made】Hole Clamp Offset Model P.8

High-Temperature Measurement: Outer Cylinder to Locate from Outside

【Custom-Made】Expansion Locating Pin P.9

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.

High Speed•High Accuracy Setup of Positioner Fixture

Air Location Clamp/Screw Locator P.10

No Manual Tightening Required. Clamping with Pull Bolt

【Custom-Made】Ball Lock Clamp (Pull Stud Clamp) P.11

Use Minimal Amount of Oil: Spring Swing Clamp

【Custom-Made】Spring Swing Clamp P.12

For Prevention of Welding Distortion

Swing Clamp P.13

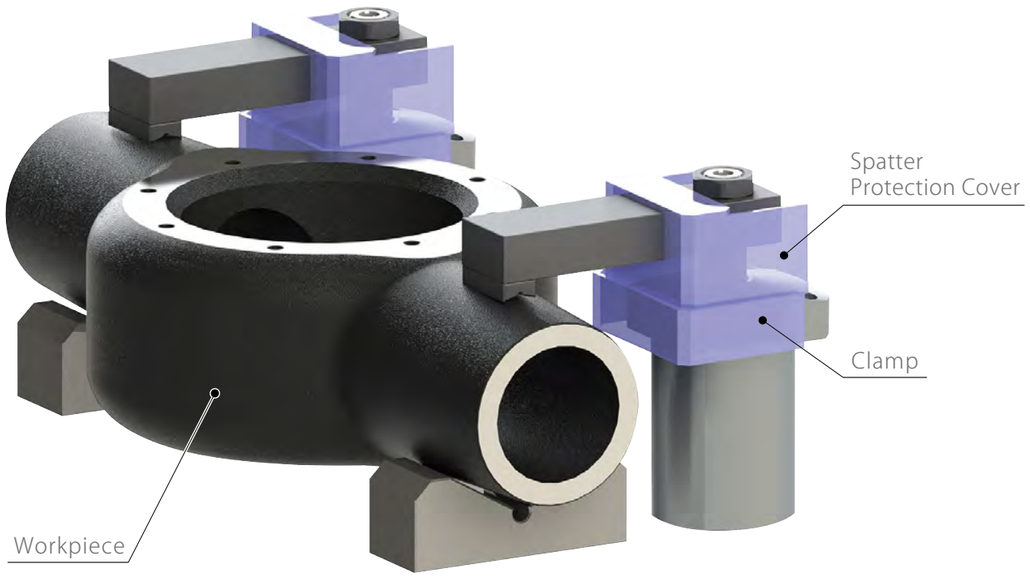
Detaching from Hydraulic Source: Reduce the Number of Hydraulic Circuits of Positioner

Non-Leak Valve P.14

Standard Clamp+Anti-Spatter Equipment

High-Power Pneumatic Swing Clamp / Link Clamp

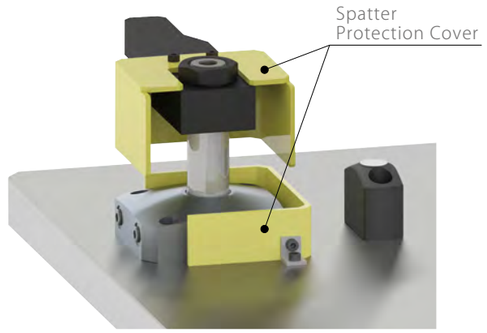
- Clamp can be damaged by spatter in welding equipment.
- This is an example of welding spatter measurement designed with Kosmek standard clamp and customer's fixture equipment. It is also suitable for spatterless FSW・FSJ, etc.
- There are various advantages of installing high-power pneumatic clamp which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



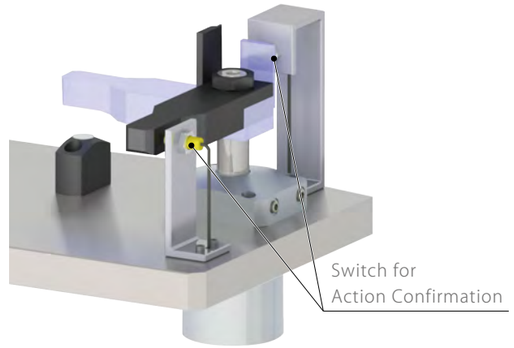
Axle Housing Welding Fixture

Welding Jig Installation Sample for Standard Clamp

Prevents spatter to the clamp with the protection cover.



When action confirmation is required.

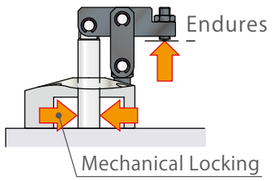


Advantages of Introducing High-Power Pneumatic Clamp

Space-Saving

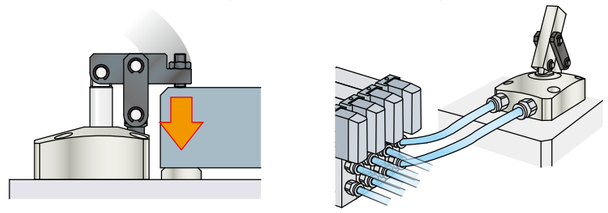
A body 2 sizes smaller with equivalent clamping force relative to Kosmek's standard pneumatic clamp makes for a smaller footprint and a reduction in costs.

Holding Force



Holding force to withstand the reaction force such as welding distortion.

Powerful Clamping Force without Hydraulic Pressure



Mechanical locking high-powered pneumatic clamps exert an equivalent clamping force relative to hydraulic clamps.

HIGH-POWER Pneumatic Series

High-Power Pneumatic Swing Clamp

HIGH-POWER Pneumatic Series

High-Power Pneumatic Link Clamp

Pneumatic Swing Clamp

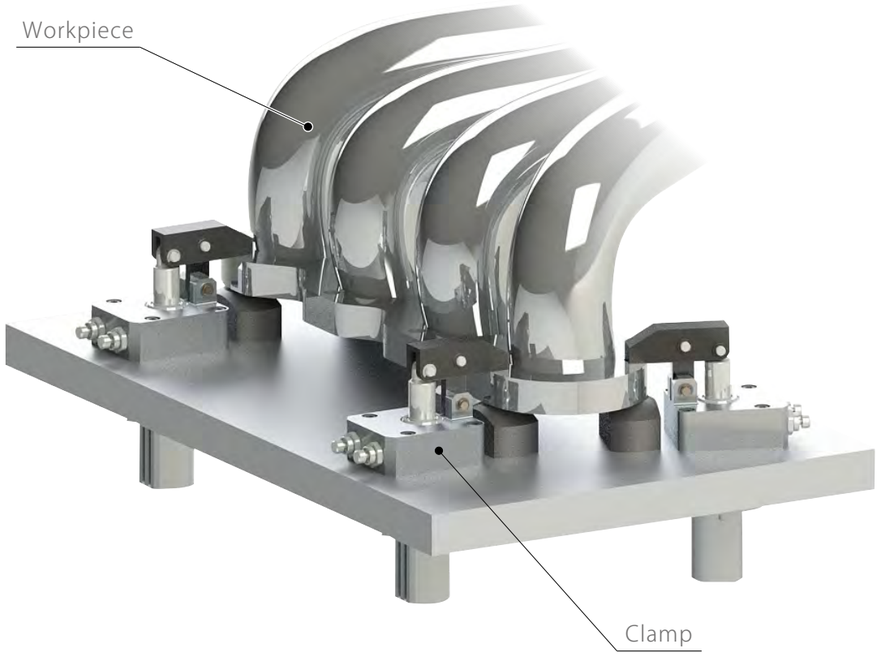
Pneumatic Link Clamp

Refer to our catalog or website for detailed specifications.

Anti-Spatter Link (Swing) Clamp Examples

【Custom-Made】 Anti-Spatter Link (Swing) Clamp

- Custom-made link clamp with higher durability designed for spatter prevention. (Further customization of swing clamp is also available.)
- Suitable when it is difficult to control spatter scattering position or to install a protection cover. It can also have an auto switch installed for action confirmation.

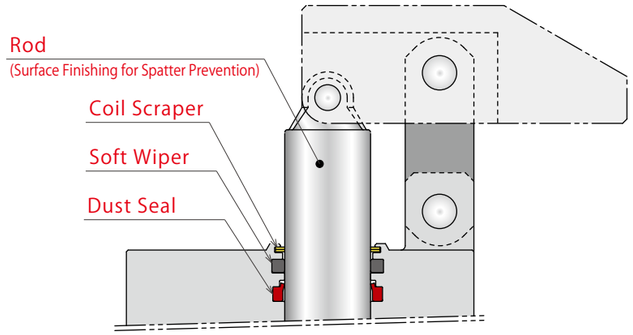


Exhaust Manifold Welding Fixture

Advantages

- Triple protection structure prevents foreign substance from entering into the cylinder.

Case Study (8-Year-Old Clamp)

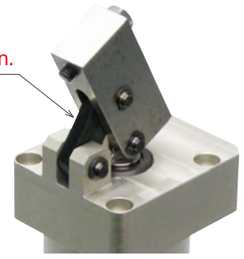


For more spatter prevention, we are working on product improvement from the case study.

- Sliding part of link function is minimal.

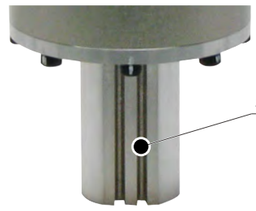
※Depends on a case example.

Using one link plate for spatter sticking prevention.
(Standard has two plates.)



- Able to install an auto switch.

※Depends on a case example.



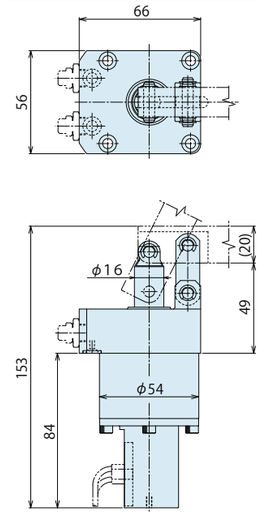
・Specifications ※Depends on a case example.

Model No. (Please contact us.)		Pneumatic Link Clamp		
		Custom-Made Equal to WCA0401	Custom-Made Equal to WCA0501	Custom-Made Equal to WCA0631
Cylinder Area for Locking	mm^2	12.57	19.63	31.17
Cylinder Force (Air at 0.5MPa)	kN	0.63	0.98	1.56
Clamping Force (Calculation Formula) ※1	kN	$F = \frac{23.76 \times P}{L - 21}$	$F = \frac{44.17 \times P}{L - 25}$	$F = \frac{84.16 \times P}{L - 30}$
Operating Pressure Range	MPa	0.1～1.0		
Operating Temperature	℃	0～70		
Usable Fluid		Dry Air		

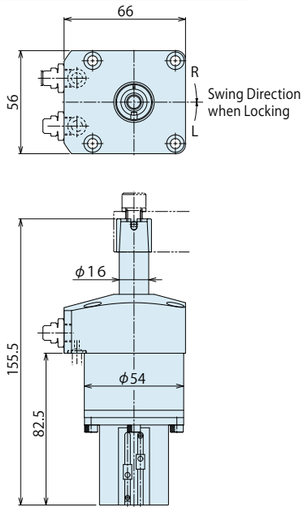
Model No. (Please contact us.)		Pneumatic Swing Clamp Custom-Made Equal to WHA0400
Cylinder Area for Locking	mm^2	10.56
Cylinder Force (Air at 0.5MPa)	kN	0.53
Clamping Force (Calculation Formula) ※1	kN	F=P×(1.034-0.0021×L)
Operating Pressure Range	MPa	0.2～1.0
Operating Temperature	℃	0～70
Usable Fluid		Dry Air

※1. F：Clamping Force (kN), P：Supply Hydraulic Pressure (MPa),
L：Distance between the piston center and the clamping point (mm).

Dimension：Custom-Made (Equal to WCA0401)



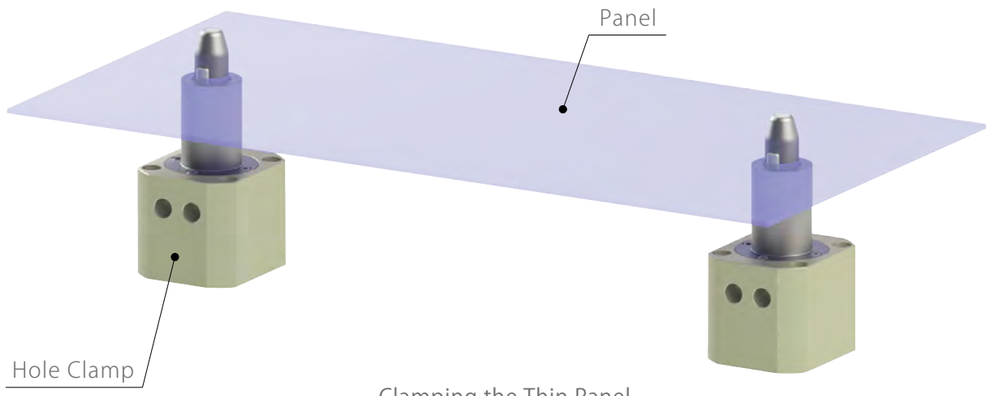
Dimension：Custom-Made (Equal to WHA0400)



Locating and Clamping of Various Thin Panels

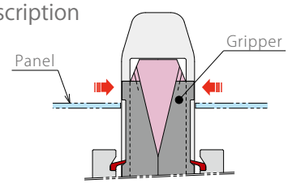
【Custom-Made】Hole Clamp PAT. P.

- This hole clamp, clamps and roughly locates a panel by using a through hole of the panel.
- With longer pulling stroke that allows for clamping panels with various thicknesses, it is suitable for thin panels used for spot welding.
- Air blow function for foreign substance prevention is also available.

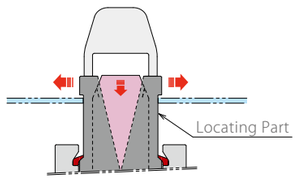


Clamping the Thin Panel

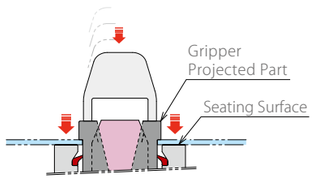
Action Description



【Released State】
Gripper is retracted.
Load/Unload the panel.

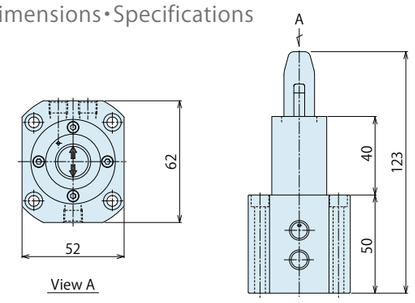


【Locking State】
Gripper is expanded.
Locate the panel.



【Locked State】
After locating, the projected part pulls the panel onto the seating surface and clamp action is completed.

Dimensions・Specifications



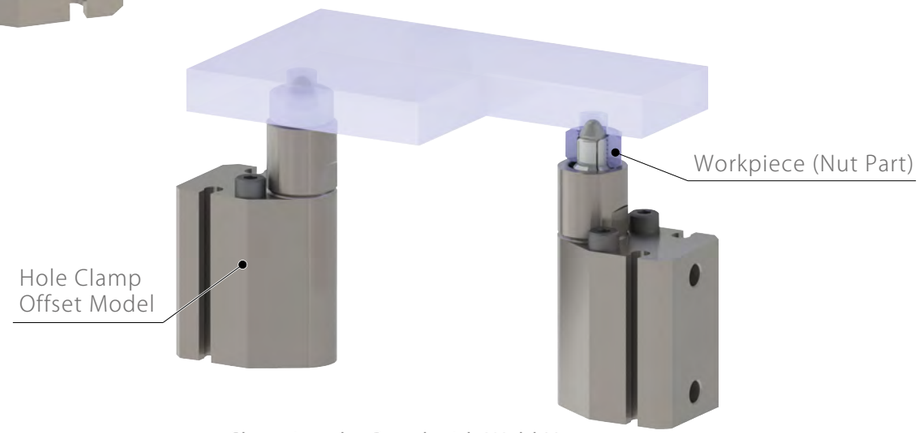
Model No. (Please contact us.)	Custom-Made Hole Clamp
Workpiece Hole Diameter mm	$16^{+0.1}_{0}$
Locating Repeatability ※1 mm	0.10
Clamping Force (at 0.4MPa) N	310
Operating Pressure Range MPa	0.3～0.5
Operating Temperature ℃	0～70
Usable Fluid	Dry Air
Air Blow Function	Yes
Air Hole for Seating Check	Yes

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

Clamping the Thread Part of Workpiece with Nut

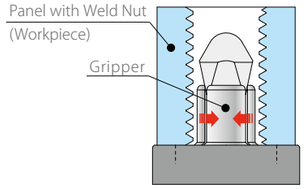
【Custom-Made】Offset Hole Clamp

This hole clamp, clamps and locates (under specific condition) the nut thread part of a panel with weld nut. Compared to swing/link clamp, there is no interference around a workpiece. This allows expansion to the accessible area of welding gun and reduces the number of setups.
Air blow function for foreign substance prevention is also available.

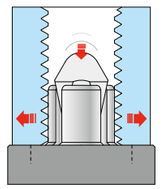


Clamping the Panel with Weld Nut

Action Description

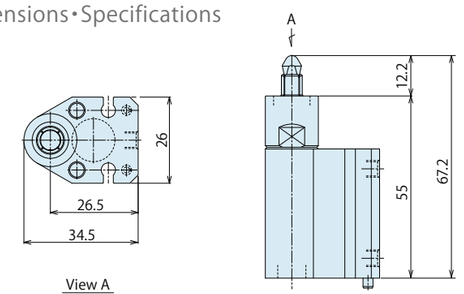


【Released State】
Gripper is retracted.
Load/Unload the panel.



【Locked State】
Gripper expands to clamp the thread part.

Dimensions・Specifications



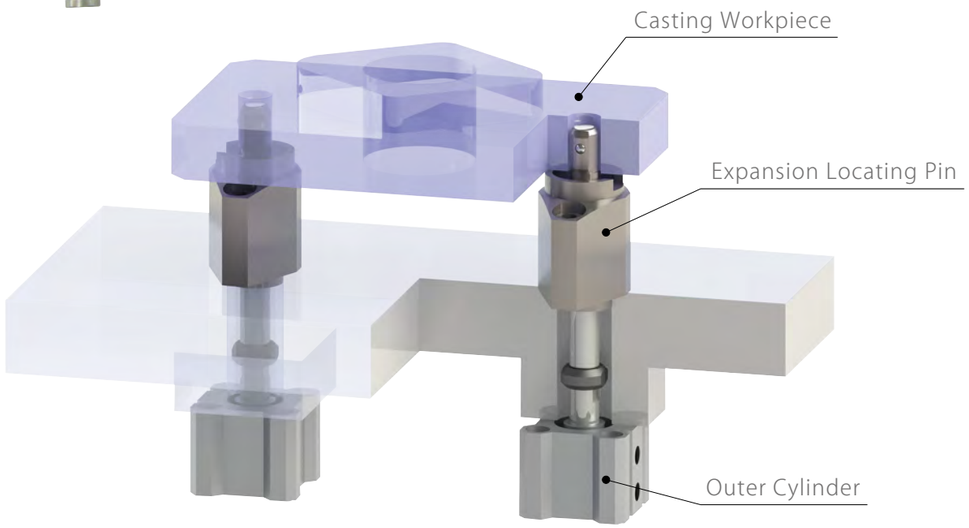
Model No. (Please contact us.)	Custom-Made Offset Hole Clamp
Workpiece Hole Diameter mm	6.8 ±0.3
Locating Repeatability ※1 mm	0.03
Clamping Force (at 0.4MPa) N	120
Operating Pressure Range MPa	0.4～0.5
Operating Temperature ℃	0～70
Usable Fluid	Dry Air
Air Blow Function	Yes
Auto Switch Installation Slot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

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

Locating Cylinder For High Temperature

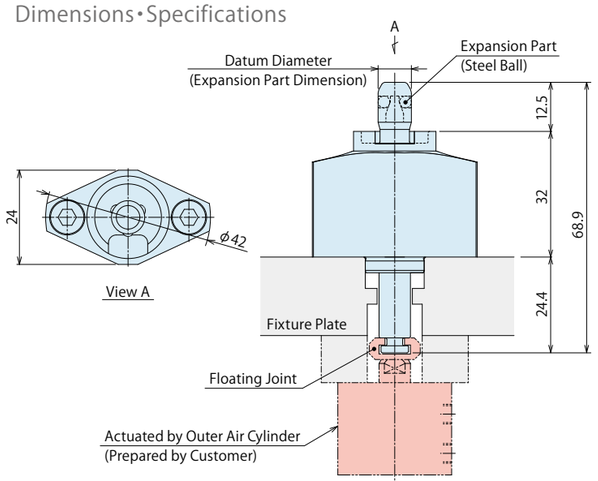
【Custom-Made】Expansion Locating Pin

- 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		ϕ8.5～9.5
Locating Repeatability ※1 mm		0.01
Datum	At Release (Max.)	ϕ8.48 or less
Diam. mm	At Full Stroke (Min.)	ϕ9.5 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 action air cylinder.

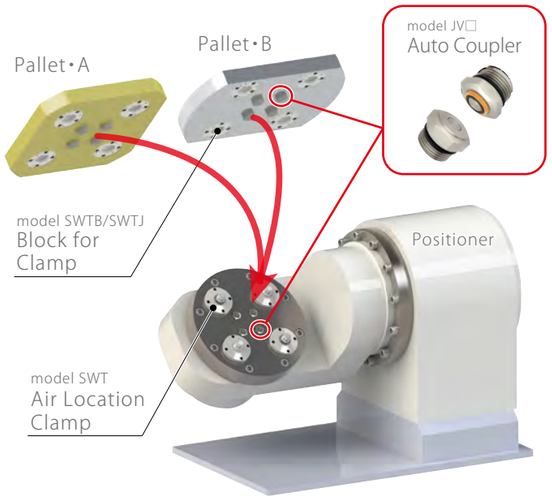
※1. Locating Repeatability under Specific Condition (No Load)

High Speed・High Accuracy Setup for Positioner

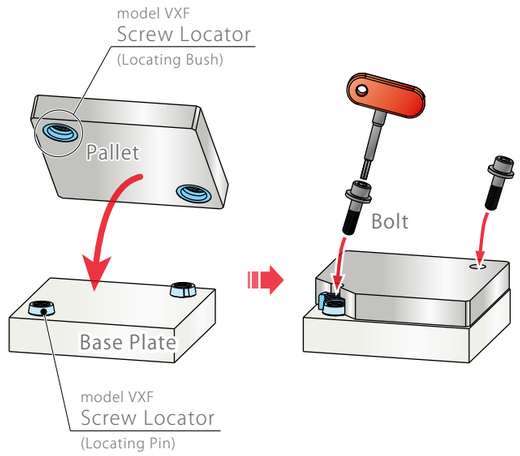
Air Location Clamp / Screw Locator **PAT.**

- Air location clamp simultaneously locates and clamps the fixture on the positioner. **【Locating Repeatability 3 μm】**
- This allows for setup time reduction and productivity improvement.
- Even for welding, the standard model is introduced since it is set under the fixture where spatter does not scatter around.

model SWT **model VXF**



Fixture Setup on the Positioner

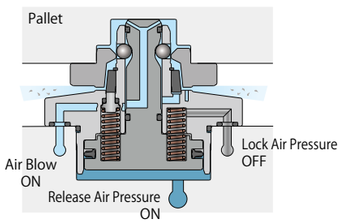


Manual Pallet Change

Advantages (model SWT)

Air Blow Function and Seat Check Function

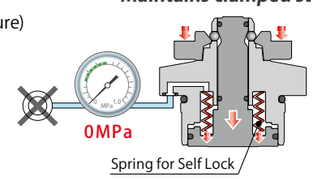
Foreign substance dust is flushed out by air blow.
Seating surface is provided with the air hole.
Use the gap sensor for seat check.



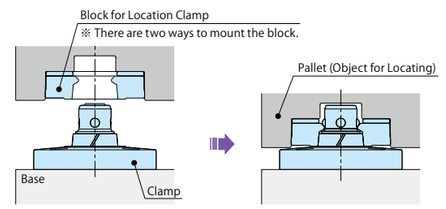
Self Lock (Safety) Function (Holding Force at 0MPa Air Pressure)

Maintains clamped state.

The internal mechanical lock operates and clamping force and holding force achieved. When pneumatic pressure is at zero, it will stay locked with mechanical lock.
※ For locating more than the minimum operating air pressure is required.



Action Description (model SWT)



Specifications

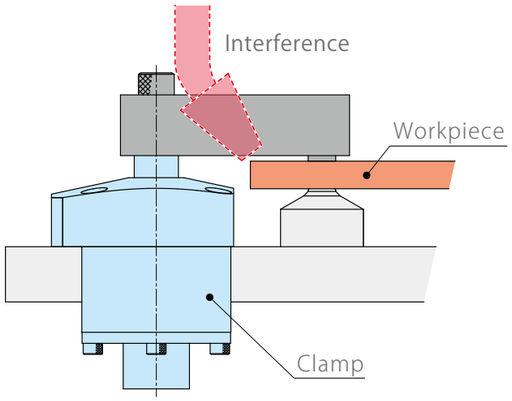
Model No.		SWT	VXF
Locating Repeatability	mm	0.003	0.003
Operating Pressure	MPa	0.35～1.0	—
Usable Fluid (Operating Method)		Dry Air	(Manual Tightening)
Air Blow・Seat Check Function		Yes	No

Refer to our catalog or website for detailed specifications.

No Manual Tightening：Clamping with Pull Bolt

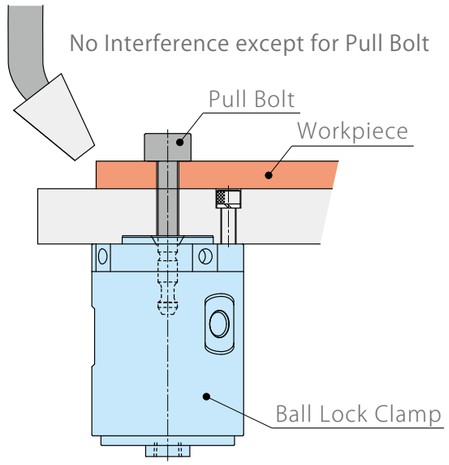
【Custom-Made】Ball Lock Clamp (Pull Stud Clamp) PAT.

- 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.

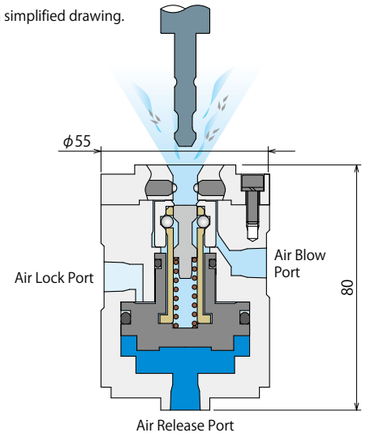


Ball Lock Clamp

Minimal Interference

Internal Structure・Dimensions・Specifications

※ This is a simplified drawing.

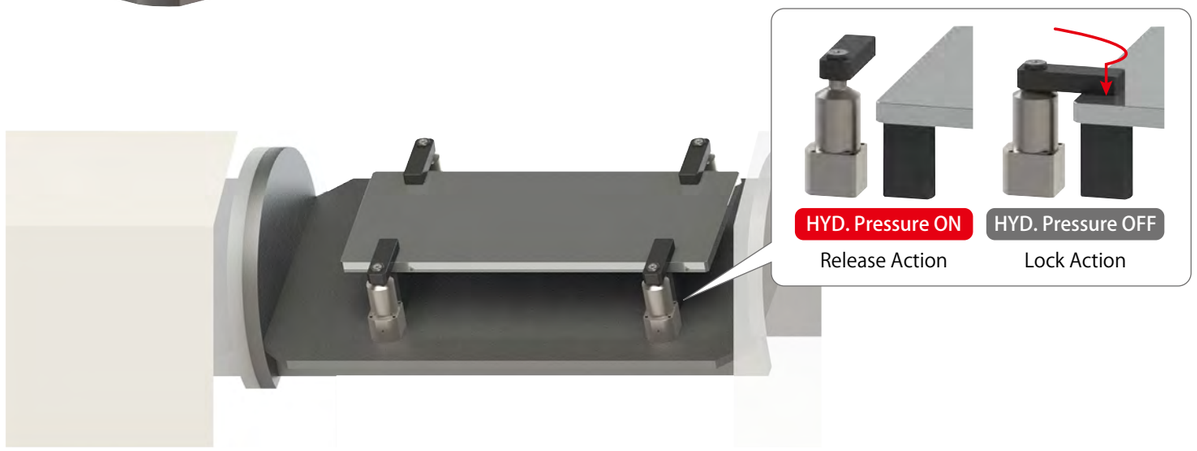


Model No. (Please contact us.)			Custom-Made Ball Lock Clamp
Clamping Force (at 0.4MPa)		kN	0.43
Full Stroke		mm	6.7
Lock Stroke		mm	3.8
Cylinder Area cm²	Lock		10.7
	Release		13.9
Sleeve Return Spring Force		N	5.0
Allowable Offset		mm	±0.5
Operating Pressure		MPa	0.40～0.45
Operating Temperature		℃	0～70℃
Usable Fluid			Dry Air

Use Minimal Amount of Oil: Spring Swing Clamp

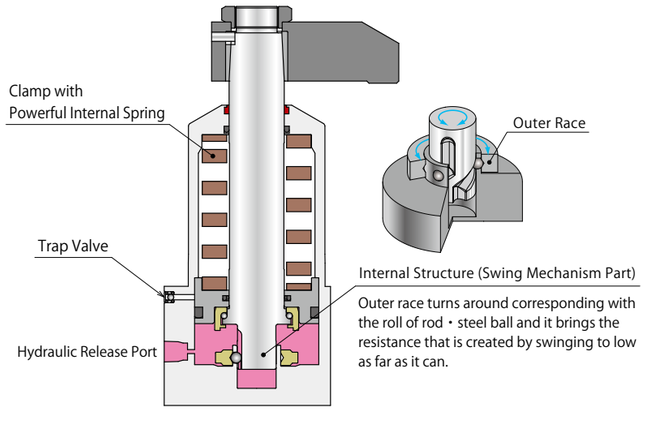
【Custom-Made】Spring Swing Clamp

- 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

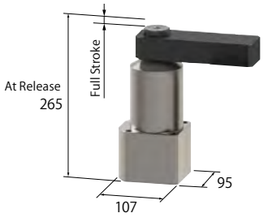
Internal Structure・Dimensions・Specifications



Internal Structure (Swing Mechanism Part)

Outer race turns around corresponding with the roll of rod・steel ball and it brings the resistance that is created by swinging to low as far as it can.

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	℃	0～70℃
Usable Fluid		ISO-VG-32 or Equivalent

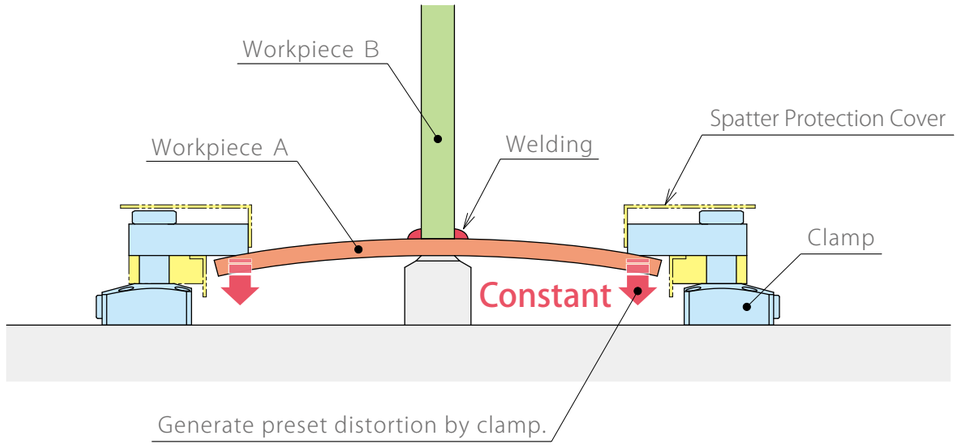


For Prevention of Welding Distortion

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.



Hydraulic High-Power Swing Clamp
model LHE

Pneumatic High-Power Swing Clamp
model WHE

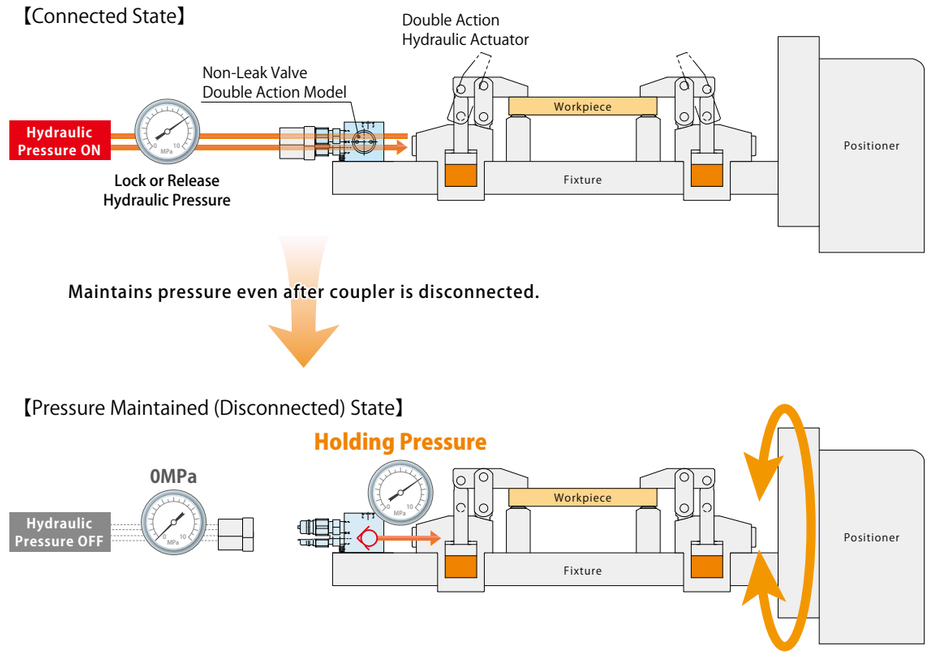
Detach Hydraulic Unit・Reduce the Number of Circuits

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 Action Model)
model BEQ

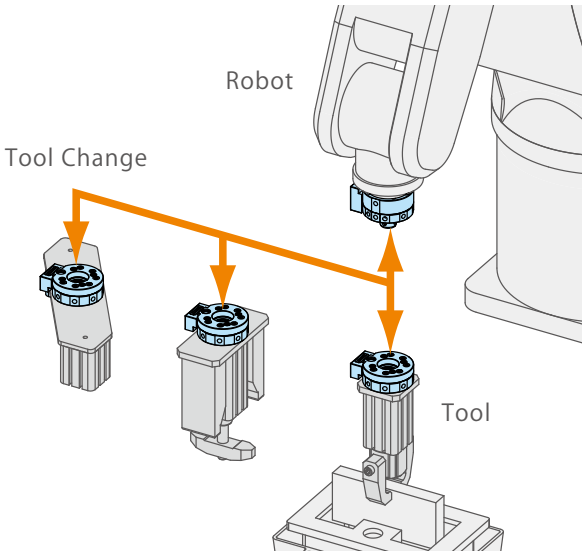
Accumulator
model JSS / JS

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 Generalization of Robots/Heavy Load Work



Robotic Hand Changer
model SWR

Robotic Hand
model WPH/WPP/WPQ

FA Pneumatic Hole Clamp
model WKH

Ball Lock Cylinder
model WKA

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