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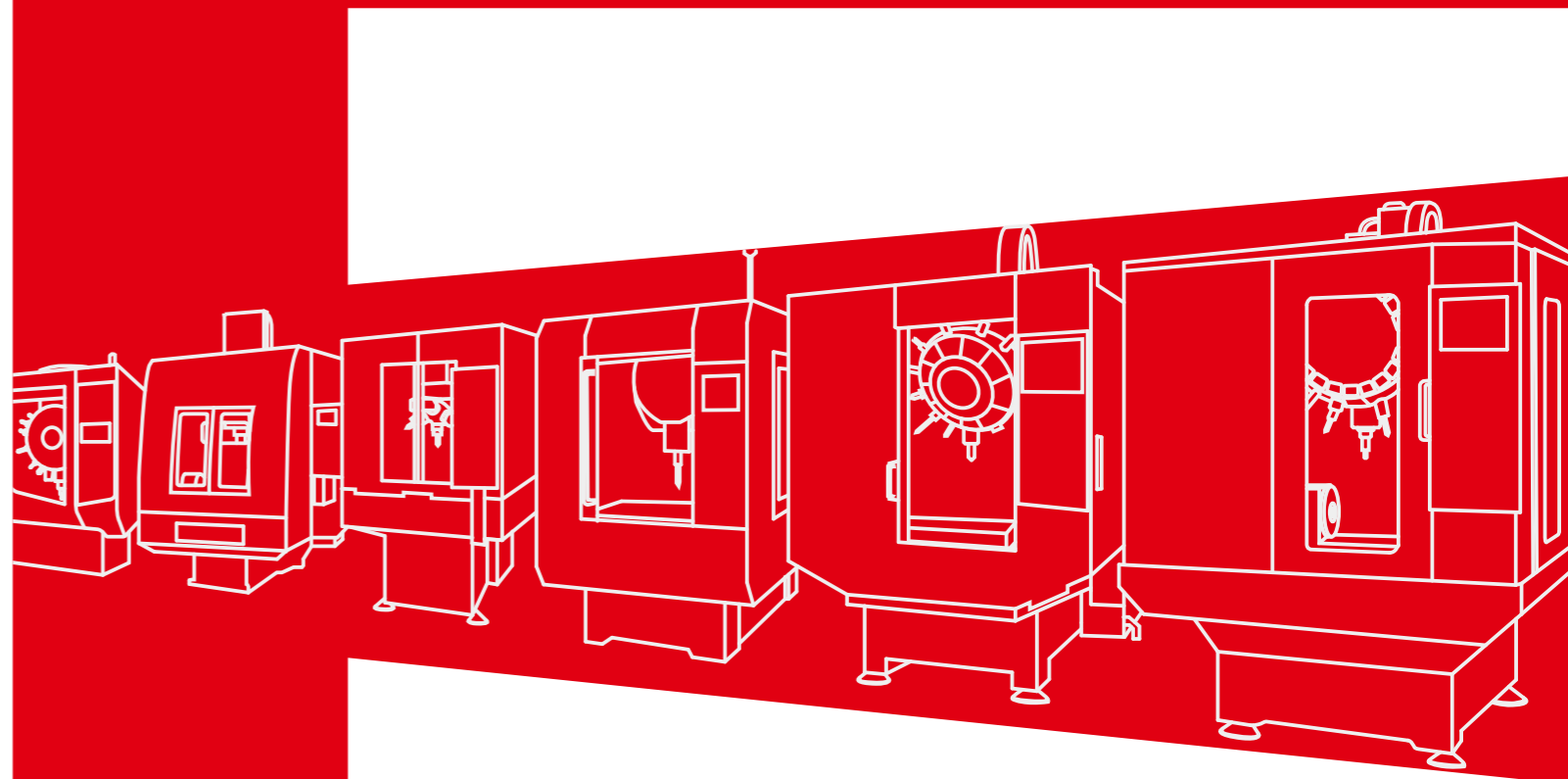
■ For Further Information on Unlisted Specifications and Sizes, Please call us.
 ■ Specifications in this Leaflet are Subject to Change without Notice.



2023/10 First ORy

HIGH-POWER
Pneumatic
 Series

High-Power Clamp BEV parts Machining Examples



Suitable for BT30 Machining Centers

Energy-saving Machining
Over 200,000 units sold!



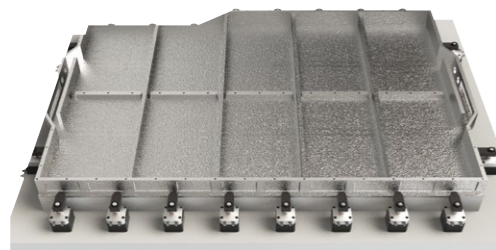
Wedge
HYBRID System using Mechanical Lock and
KOSMEK Exclusive High-

Air
Pneumatic Pressure
 **Hydraulic-less machining**
Power Pneumatic Clamp !

High-Power Pneumatic Clamp, Suitable for

EV / BEV Machining • Carbon Neutrality

High-Power Pneumatic Clamp is the solution



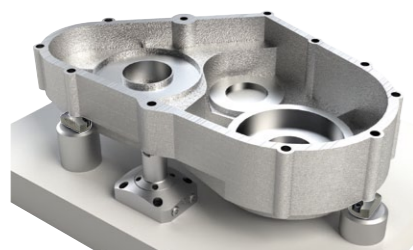
High quality machining with pneumatic clamp

Clamping force equivalent to hydraulics.
Powerful holding force prevents deformation.
P.3



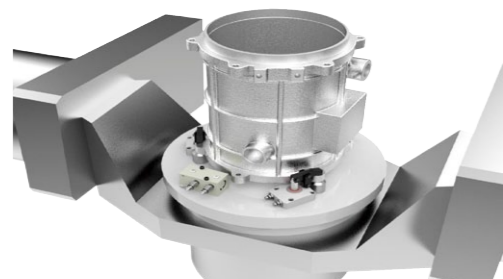
Prevents deformation of light /thin workpiece

Prevents chattering and deformation.
Enables machining of thin workpieces with high accuracy.
P.7



High-accuracy locating prevents locating errors

Expansion locating pin enables high-accuracy locating
of workpieces and smooth loading/unloading.
P.9



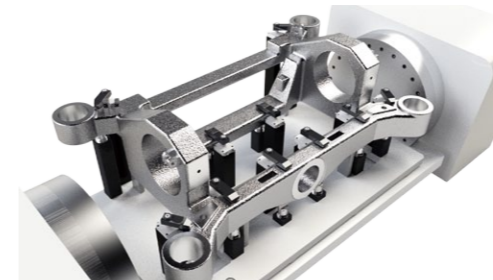
5-axis machining by pressure holding

KOSMEK Air Non-Leak system can maintain air pressure
improves machine utilization by reducing the number
of ports and outside setup.
P.11



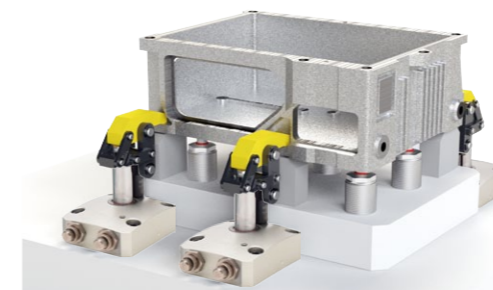
Process integration / Minimum setup

Achieves 5-face machining by clamping the hole at the
bottom of the workpiece. Tool's projecting length can
be minimized.
P.13



Enables multiple workpieces

Enables multiple workpiece production by quick
change pallet clamps.
P.15



Clamps difficult shape part

Approaching a workpiece from large amount of
retraction.
P.17

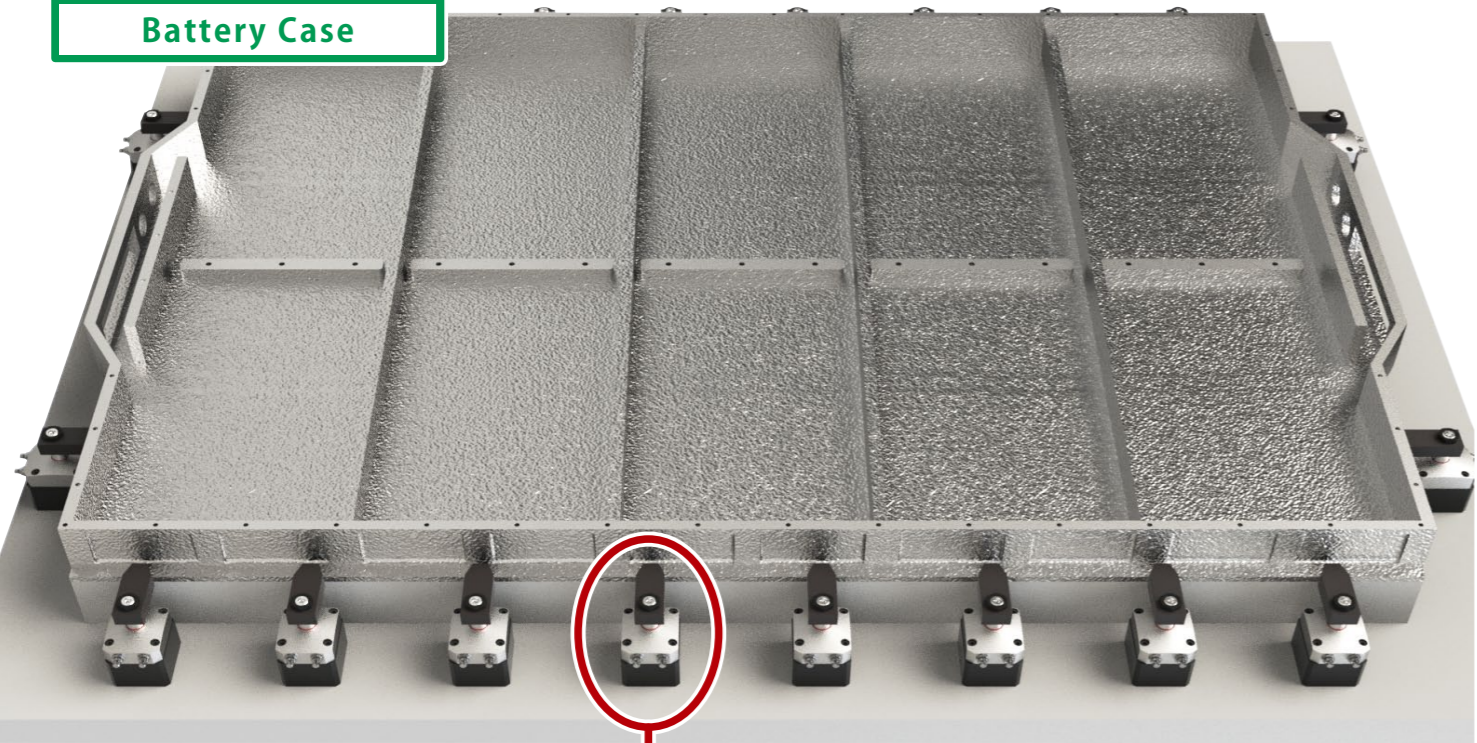


Advantages of High-Power Pneumatic Series

Examples of replacement of hydraulic clamps with
high-power pneumatic clamps.
P.19

Enables machining with Air
Powerful holding force with Mechanical Locking

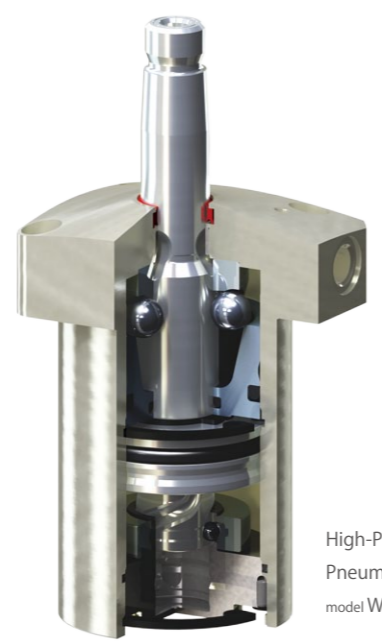
Workpiece Image
Battery Case



High-Power Pneumatic Swing Clamp/Link Clamp

model **WHE / WCE**

High clamping force with pneumatic and mechanical lock system.
Stronger holding force with mechanical lock clamping force.

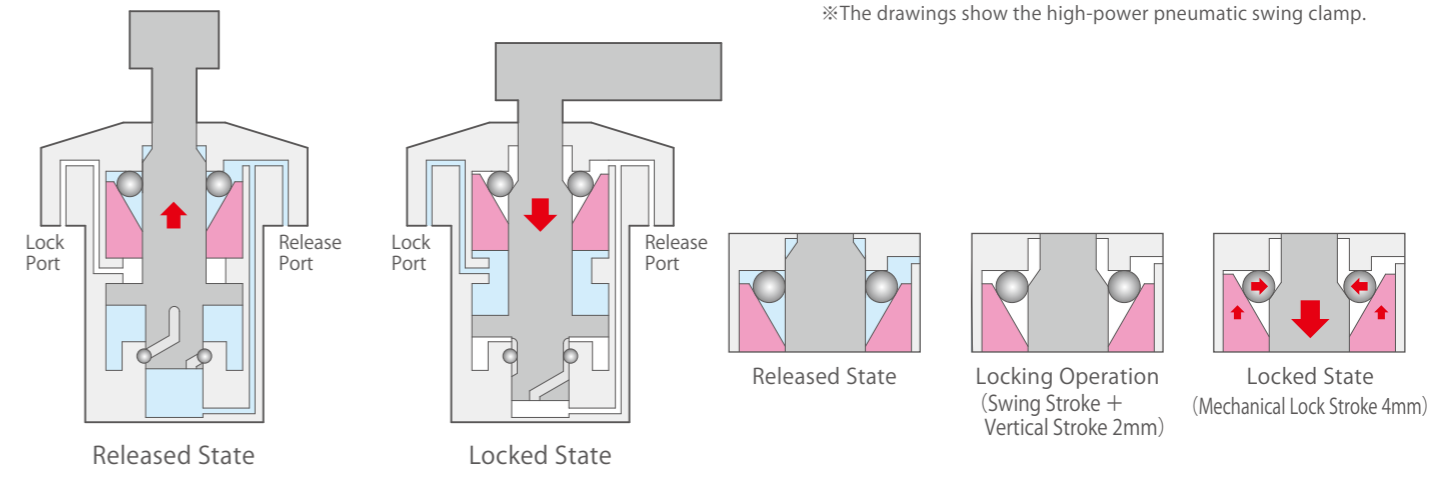


High-Power
Pneumatic Swing Clamp
model WHE

HYBRID System using
Wedge
Mechanical Lock and
Air Oil
Pneumatic / Hydraulic

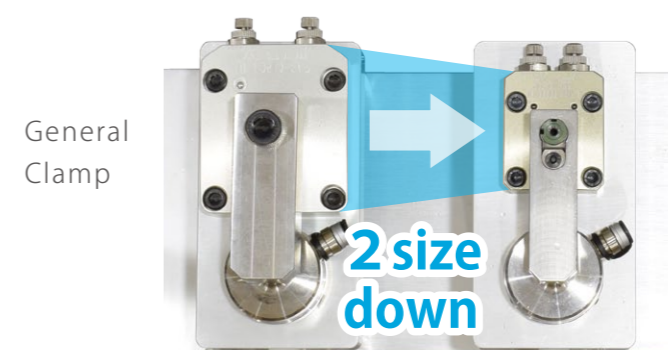
High-Power Clamp with Mechanical Locking System PAT.

※The drawings show the high-power pneumatic swing clamp.



Smaller Footprint

Smaller cylinders allow for more compact fixtures.
Exerts approximately 3 times higher clamping force than the same size comparison cylinder.

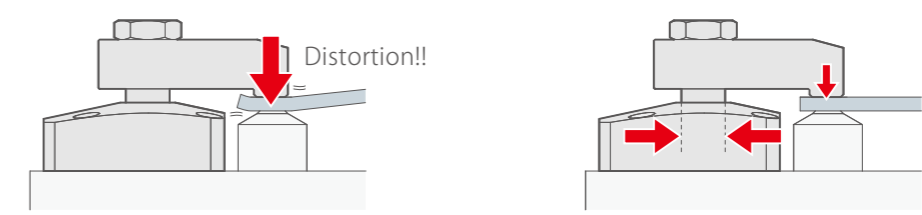


High-Power Clamp

The downsized clamp exerts the equivalent force to the general clamp.

High Quality

Optimum clamping force does not distort workpiece and holding force is strong enough to withstand machining loads, allowing for high quality machining.



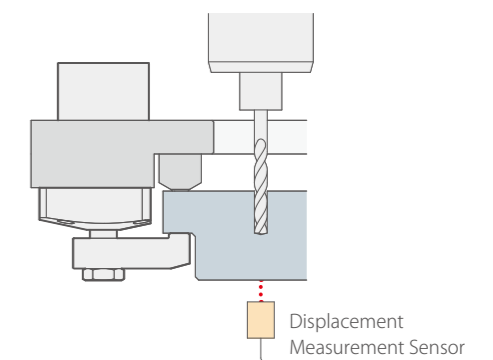
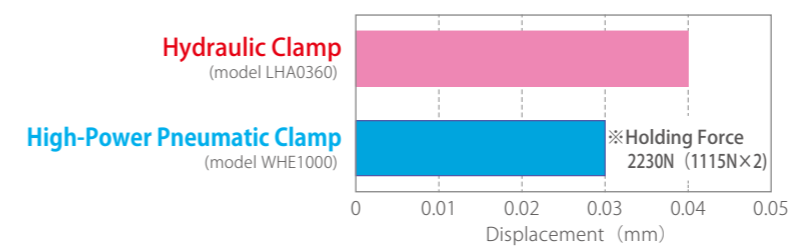
General Clamp :
The workpiece is distorted due to strong clamping force.

High-Power Clamp :
Clamping force is lowered, yet the workpiece is supported by holding force.

Backside Machining

Holding force, more powerful than clamping force, enables backside machining with high speed.

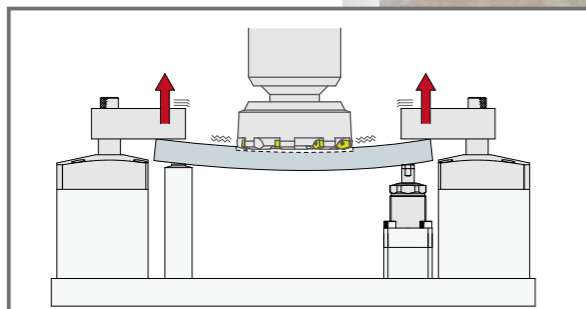
【 Machining Condition 】				
Displacement	Drill Diameter	8.5 mm	Cutting Speed	25 m/min
※ Machining results by our own.	Main Axis Revolution	936 rpm	Feed Speed	0.100mm/rev
	Workpiece Material	S45C	Clamping Force	860N (430N×2)



No Chattering on Aluminum

Great Difference Shown by
the Actual Machining Tests

Unable to Machine
due to Chattering



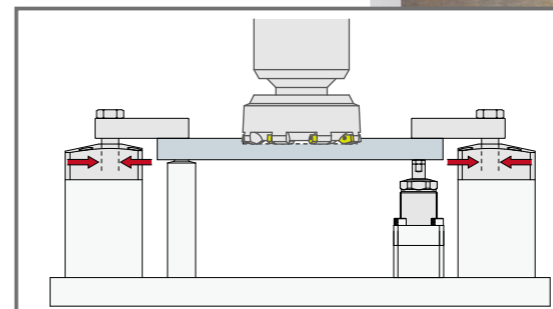
Unable to withstand reaction force.

Unable to Machine with
General Swing Clamp

Workpiece with High-Power Clamp



Properly Machined
with No Chattering



Holding force withstands reaction force

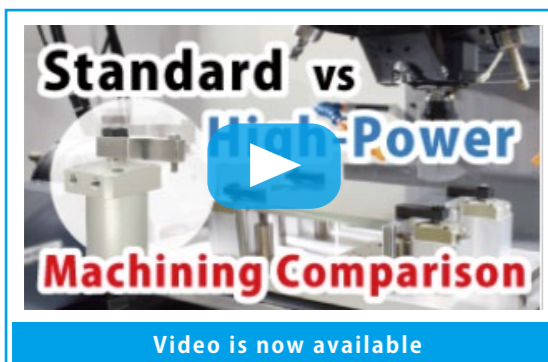
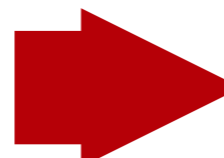
Able to Machine with
High-Power Swing Clamp

Clamping Conditions

Model No. / Product Name	Clamping Force	Holding Force	Supply Pressure
WHE0600 × 4 High-Power Pneumatic Swing Clamp	1,190 N	3,670 N	0.29MPa
WHA0400 × 4 Pneumatic Swing Clamp		-	0.32 MPa

Machining Conditions


Tool Diameter	Workpiece Material	Infeed (Depth)	Coolant	Feed Speed
80mm	Aluminum (A5052)	3mm	Yes (Water Soluble)	896mm/rev



Machining example video is available on our website.

High-Power Pneumatic Swing

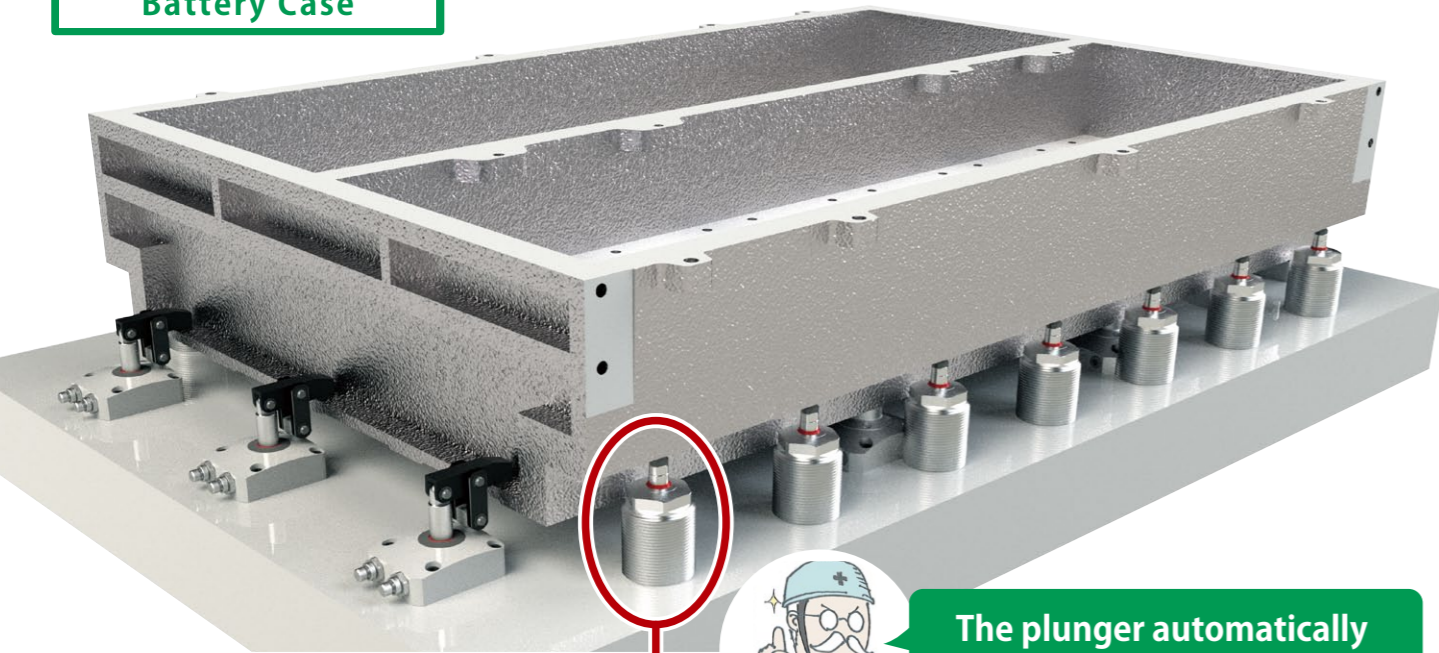
Video Title
【Machining Comparison】 High-Power Pneumatic Swing Clamp vs Standard Pneumatic Clamp

http://www.kosmek.co.jp/php_file/video_products.php?id=060&lang=2 

High-Power Pneumatic Work Support

The prevention of chattering and deformation improves accuracy.

Workpiece Image
Battery Case



The plunger automatically stops when it touches the workpiece.



High-Power Pneumatic Work Support

model **WNC**

Strong support force that is equivalent to hydraulic pressure prevents chattering and deformation during workpiece machining.

The work support has been improved for environmental resistance:

Exclusive Scraper for excellent draining of cutting chips.

Knockout Function to release adherence that ensures highly reliable operation.



Machining example video is available on our website.

Chattering Prevention Effect

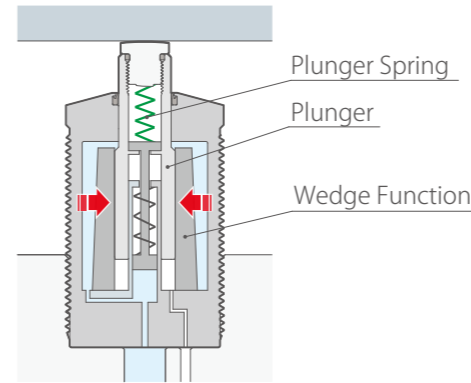
Search

Video Title : Chattering Prevention Effect by Work Support

http://www.kosmek.co.jp/php_file/video_products.php?id=057&lang=2

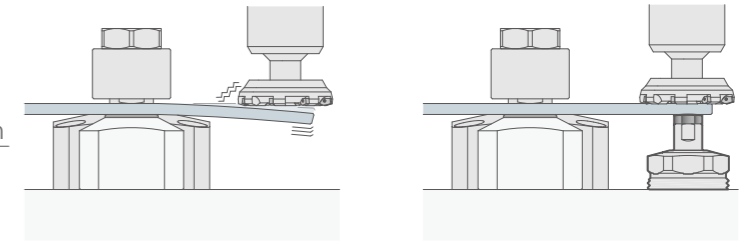


Chattering Prevention



< Internal Action Image >

After the plunger touches the workpiece with slight spring force, it is locked tightly with the wedge function, preventing chattering and deformation of the workpiece.

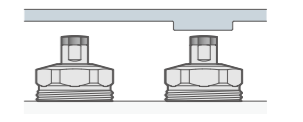
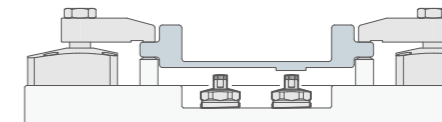
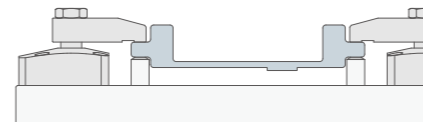


Chattering

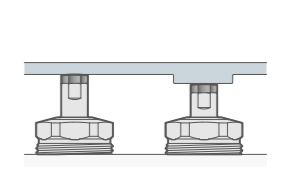
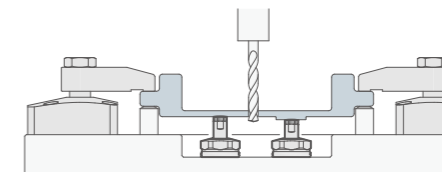
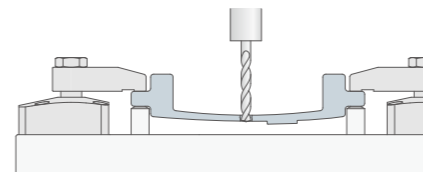
No Chattering!!

Deformation Prevention

Plunger is locked where it touches the workpiece within the stroke range.



Before plunger is lifted up



Locked after touching workpiece

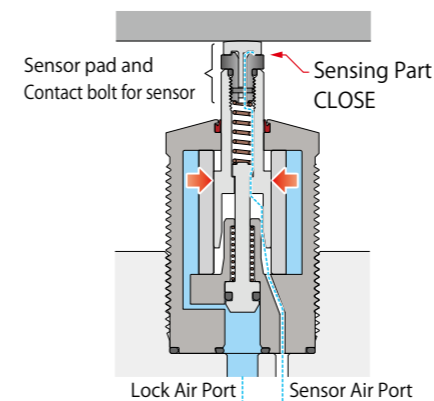
Without Work Support

With Work Support

Bending

No Bending!!

Action Confirmation



Pressure Sensor ON

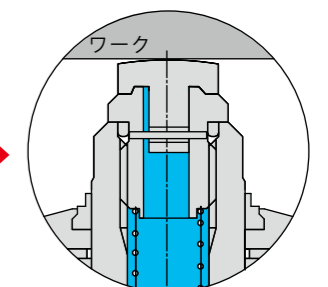
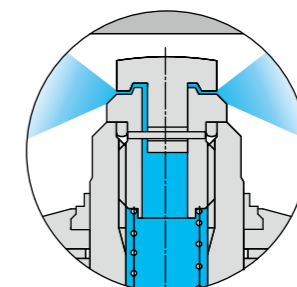
Air Sensor ON

Options

Air Sensing Option ※An air sensor is required.

The sensing part opens and closes when the plunger touches the workpiece, allowing for plunger advance action confirmation.

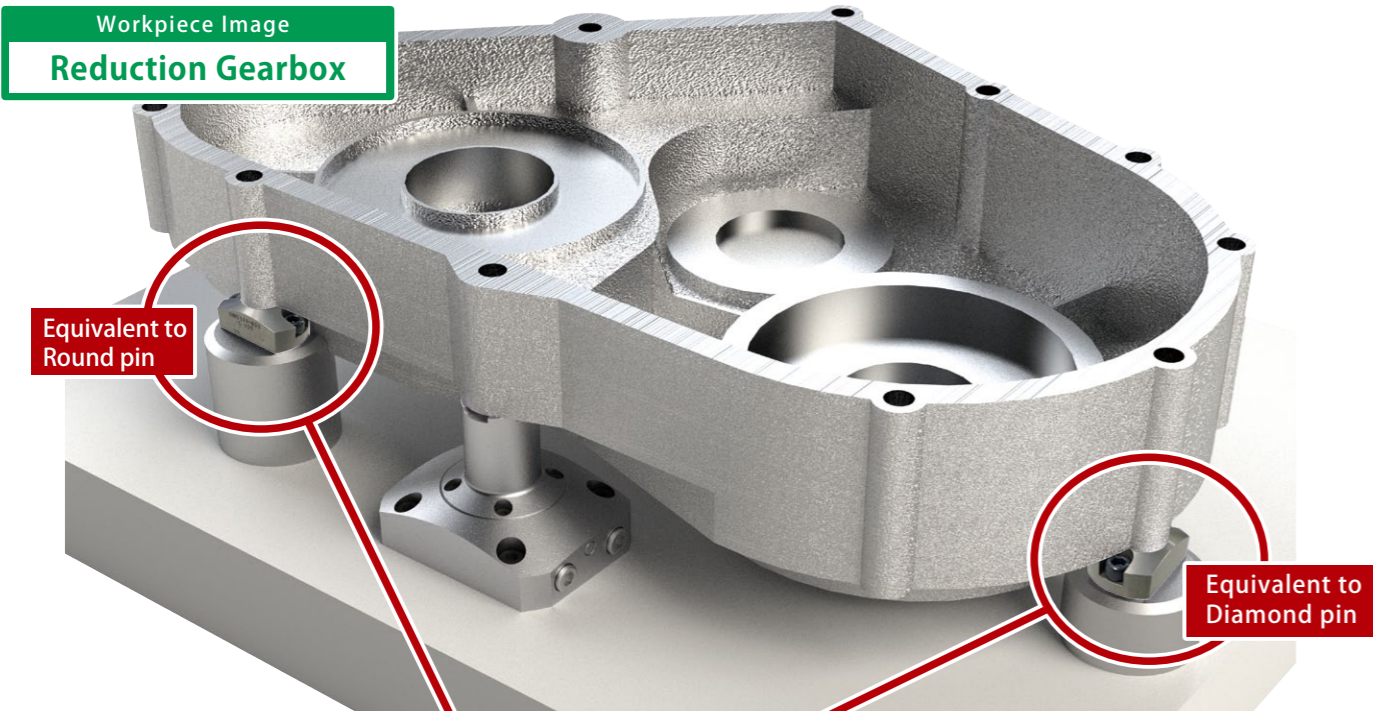
Highly reliable action confirmation function suitable for automation.



Sensing OPEN (OFF)

Sensing CLOSE (ON)

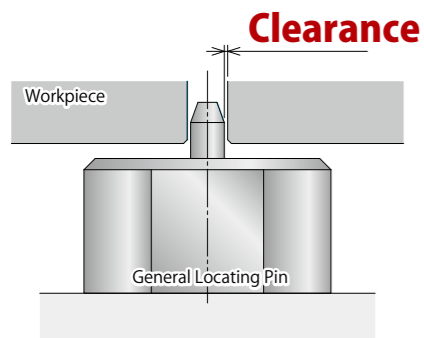
High-Accuracy expansion locating pin Improves workpiece machine quality.



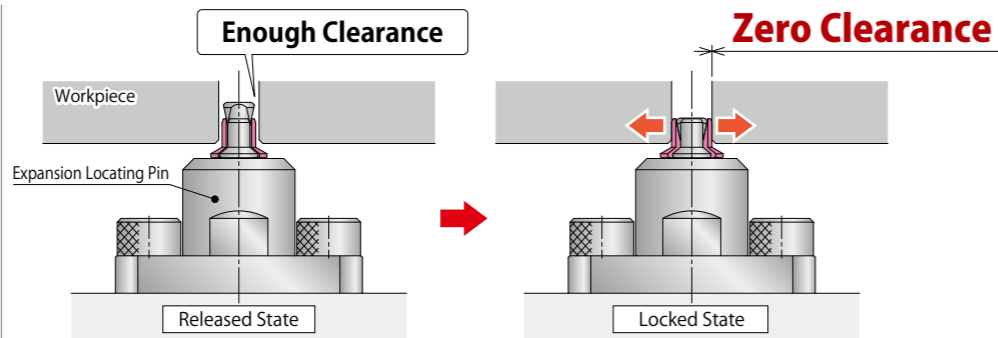
Expansion Locating Pin

model **VWH / VWM / VWK**

Expansion of locating part allows for high-accuracy locating of workpieces and smooth loading/unloading.
Line-up of various sizes according to workpiece hole diameters.



The general locating pin has some clearance between pin and workpiece hole.



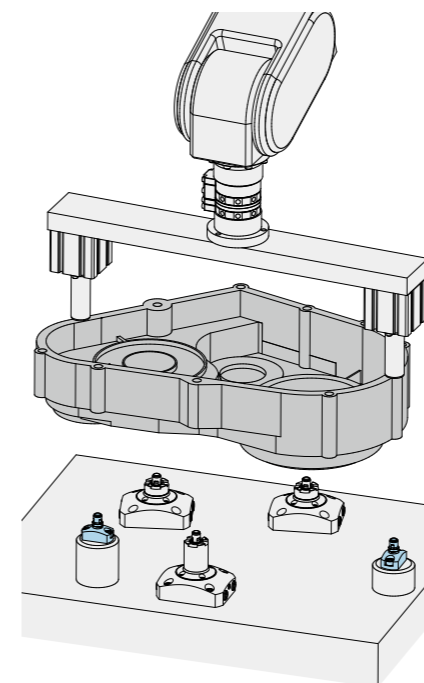
Expansion locating pin has **zero clearance!!**

When expanded : Clearance between the pin and reference hole becomes zero to locate with high accuracy.

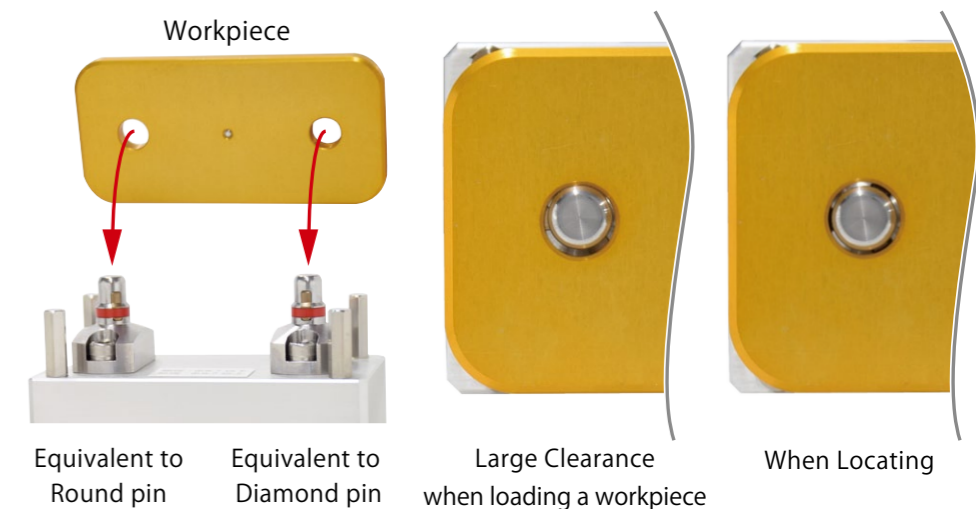
When released : Easy to load/unload workpieces with enough clearance.

Expansion Locating Pin with The World's Smallest Diameter

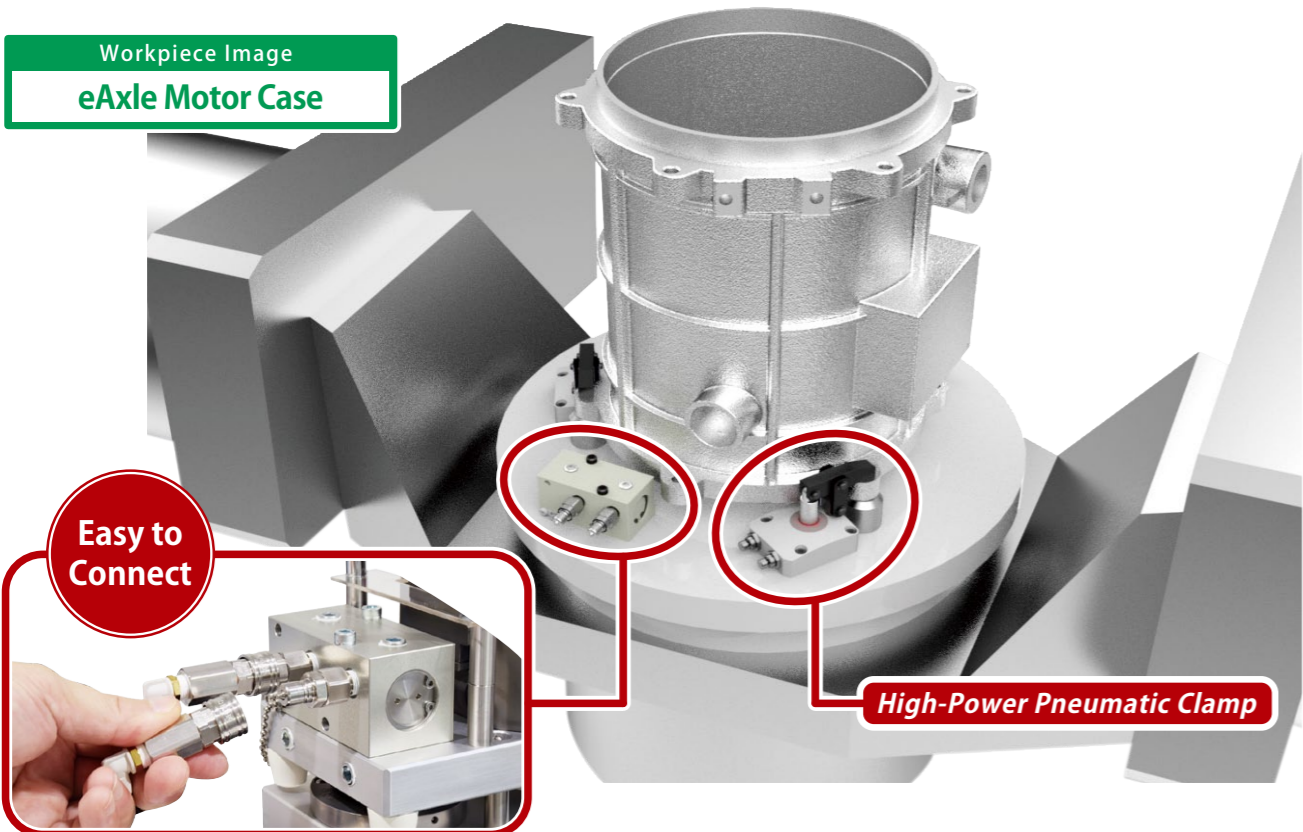
	High Accuracy Model model VWM	Large Expansion Model model VWH	Casting Material Model model VWK
Locating Repeatability	3 μm	VWH1000 : 30 μm VWH2000/3000 : 10 μm	10 μm
Control Method	Double Action (Air+Spring Lock / Air Release)	Double Action (Air Lock / Air Release)	Double Action (Air Lock / Air Release)
Workpiece Hole Diam.(mm)	φ8 ~ φ30	NEW φ5、φ6、φ7、φ8 φ9 ~ φ15	NEW φ5.7~6.6, φ6.7~7.6 φ7.6 ~ φ16.2
Action Description	The taper sleeve expands. Released State → Locked State	Large Gripper Expansion Released State → Locked State	The steel balls come out from the pin. Released State → Locked State



model **VWH** is suitable for automatic loading and unloading with large clearance.



Maintain pressure with Air Non-Leak Valve. Solution for limited ports.



Air Non-Leak Valve Air Double-Acting

model **BWQ**
Pilot Check Valve with Air Non-Leak* Function.
A2 port (outgoing lock air) maintains air pressure even after disconnected from the air source unless air is provided to B1 port (release port).
※ "Air Non-Leak" means that the outgoing A2 port has pressure maintaining ability for more than 24 hours (under constant temperature).

Outside the machine
Preparing outside

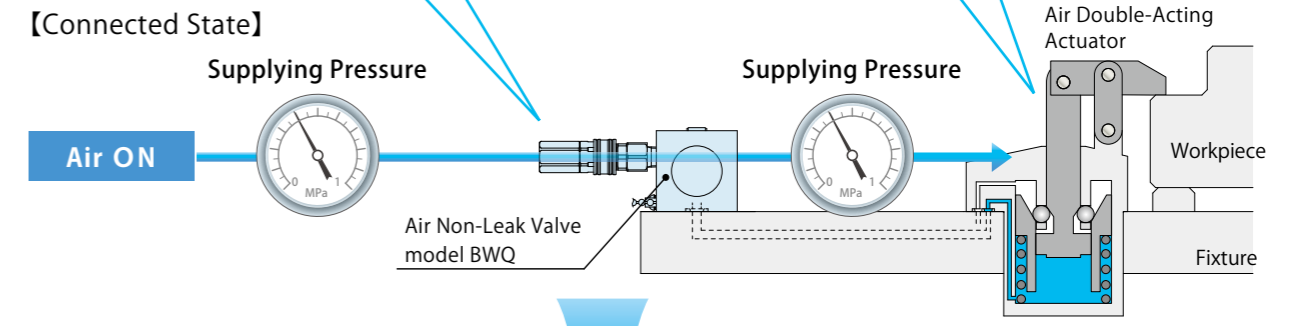
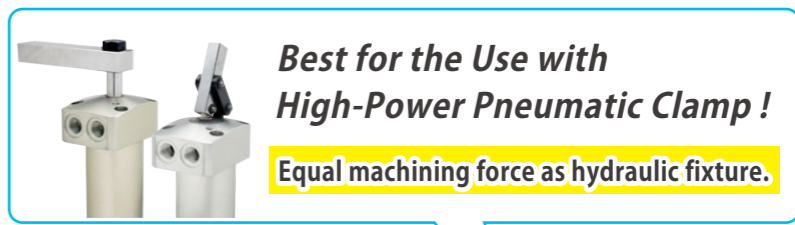
Setup Outside the Machine
Improves Machine Up Time

Reduce the Number of
Circuits in the Machine

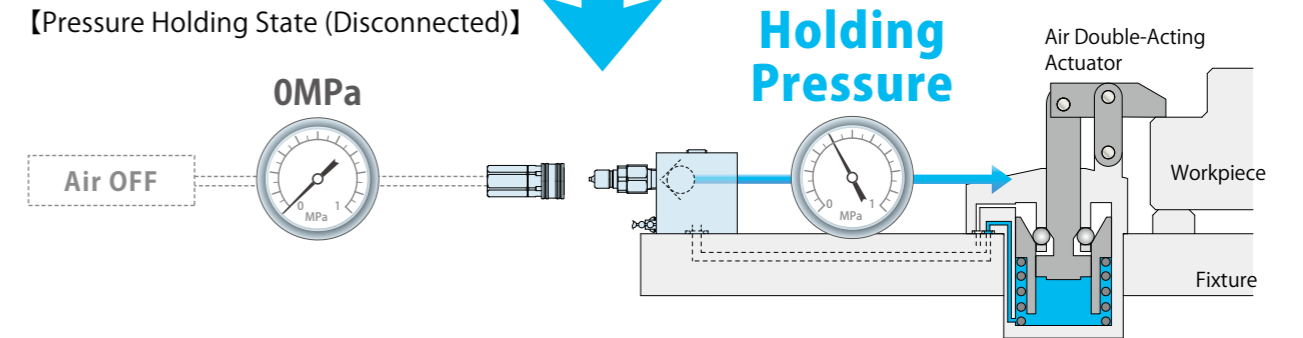
Inside the machine
Outside the machine

Outside Setup by Disconnecting
Air of APC, Pallet Pooling, etc.

No Hydraulic Use
Energy-Saving



Holds the pressure even after the coupler is disconnected.



- Notes for Usage (BWQ)
- "Air Non-Leak" means that a single BWQ unit (A2 port) has pressure maintaining ability for more than 24 hours (under constant temperature). This cannot be used in equipment that requires the leakage amount level that is confirmed by tracer gas leak testing using helium and hydrogen.
 - After installing parts of pressure maintaining circuit, confirm pressure maintaining by testing leakage at each connecting part using leak checker, etc. (Please install a pressure gauge in the circuit.)
 - When disconnecting the socket of the coupler, make the socket on the both circuits to pressure zero and in an opened state in order to maintain pressure with the check valve built in the body. (Control Valve Example: 5-port 3-position exhaust center)
 - Before disconnecting/connecting the coupler, remove cutting chips and coolant with air blow, etc. Also, install the coupler cover except during disconnecting/connecting operation.
 - Even though this product is equipped with filter, please note that inadequate flushing may result in poor flow performance or malfunction due to clogging of the built-in filter.

Automatic Connection

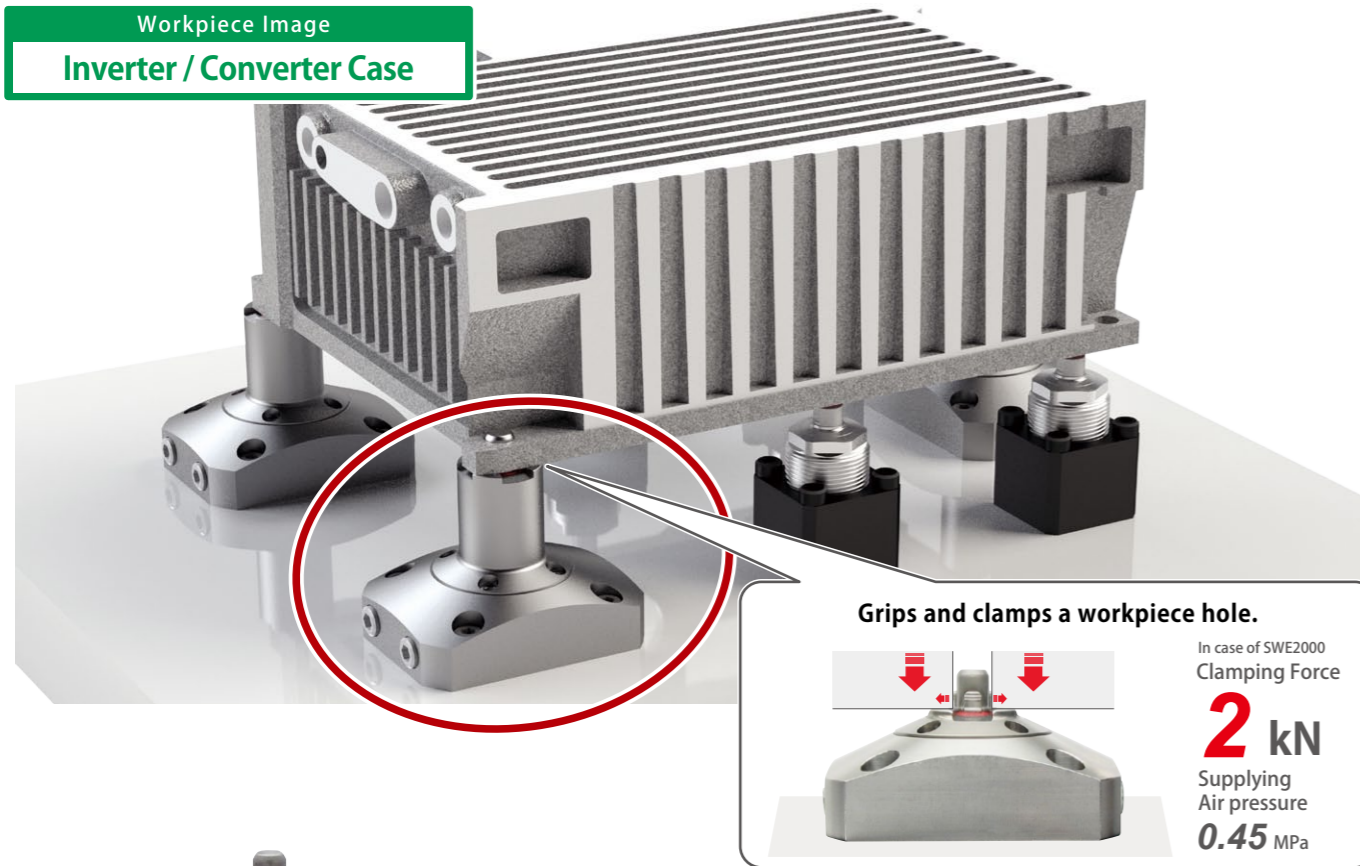


Air Non-Leak Coupler

model **BWA/BWB**

By connecting and disconnecting under pressure, the BWA port (outgoing lock air) maintains air pressure after disconnected (Air Non-Leak* Function).
※ "Air Non-Leak" means that the BWA outgoing side has pressure maintaining ability for more than 24 hours (under constant temperature)

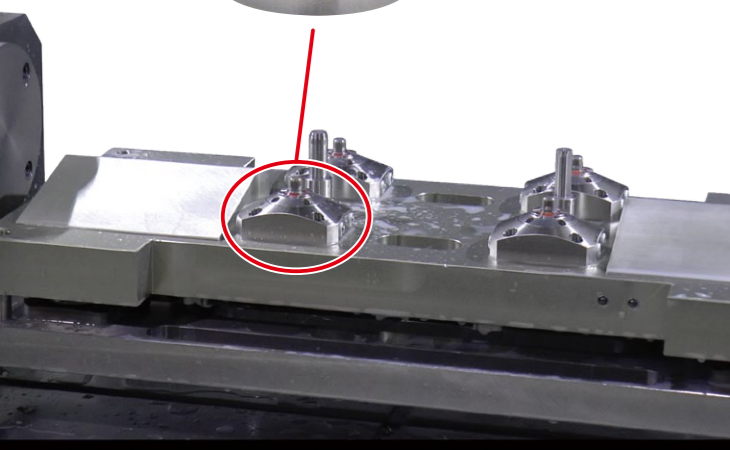
Zero interference and minimum setup Strong clamping force replaces hydraulics



High-Power Pneumatic Hole Clamp

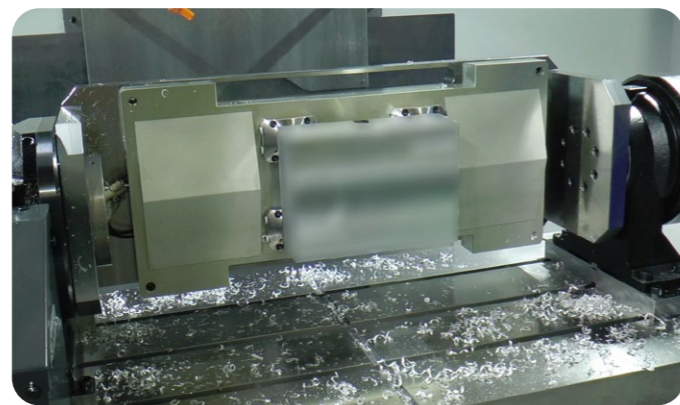
model **SWE**

Mechanical lock function allows for powerful clamping force equivalent to hydraulic clamp. By expansion of gripper, pulls and clamps in a workpiece hole. Even when air pressure is at zero, internal spring ensures clamping force.

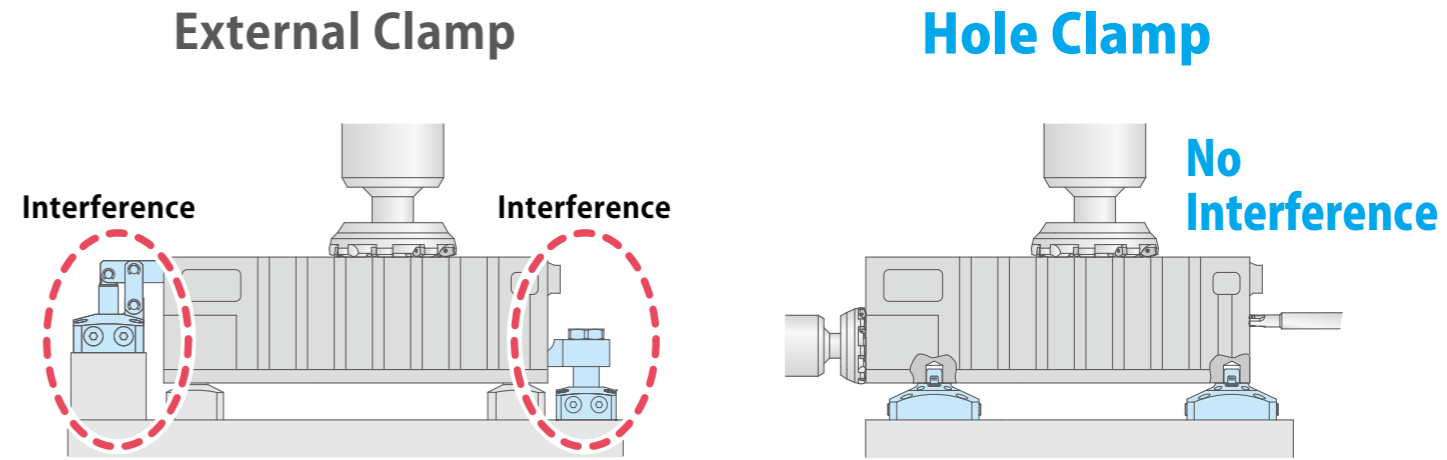


Simplifies a Fixture

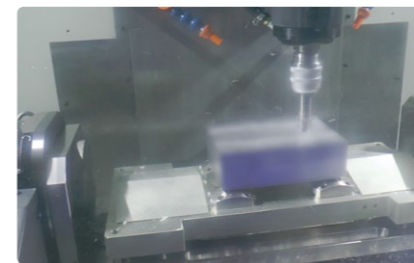
Less interference allows for workpiece loading with a robot. Inclined surface on the flange enables easy flow of cutting chips, resulting in less malfunctions caused by piled-up cutting chips.



Side-Surface Machining Possible with a Powerful Clamping Force



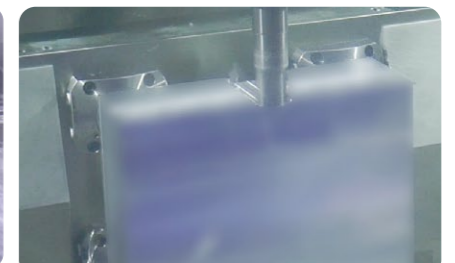
	External Clamp	Hole Clamp
Integration	The number of machinable faces without interference	3 Faces
Automation	Teaching and designing of transfer equipment	5 Faces
Accessibility	Accessibility of machining tool	Difficult
Fixture Size	Table size Equipment size	Easy
	Distant	Close
	Large	Compact



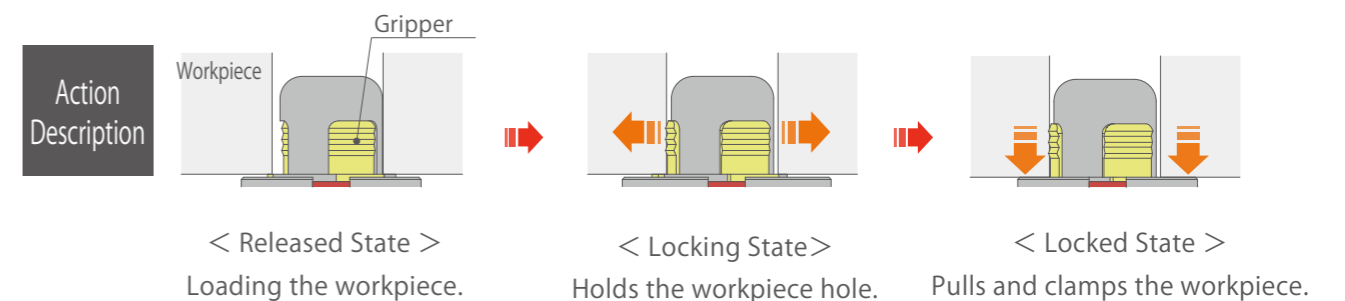
Top Surface Milling



Side Surface Drilling

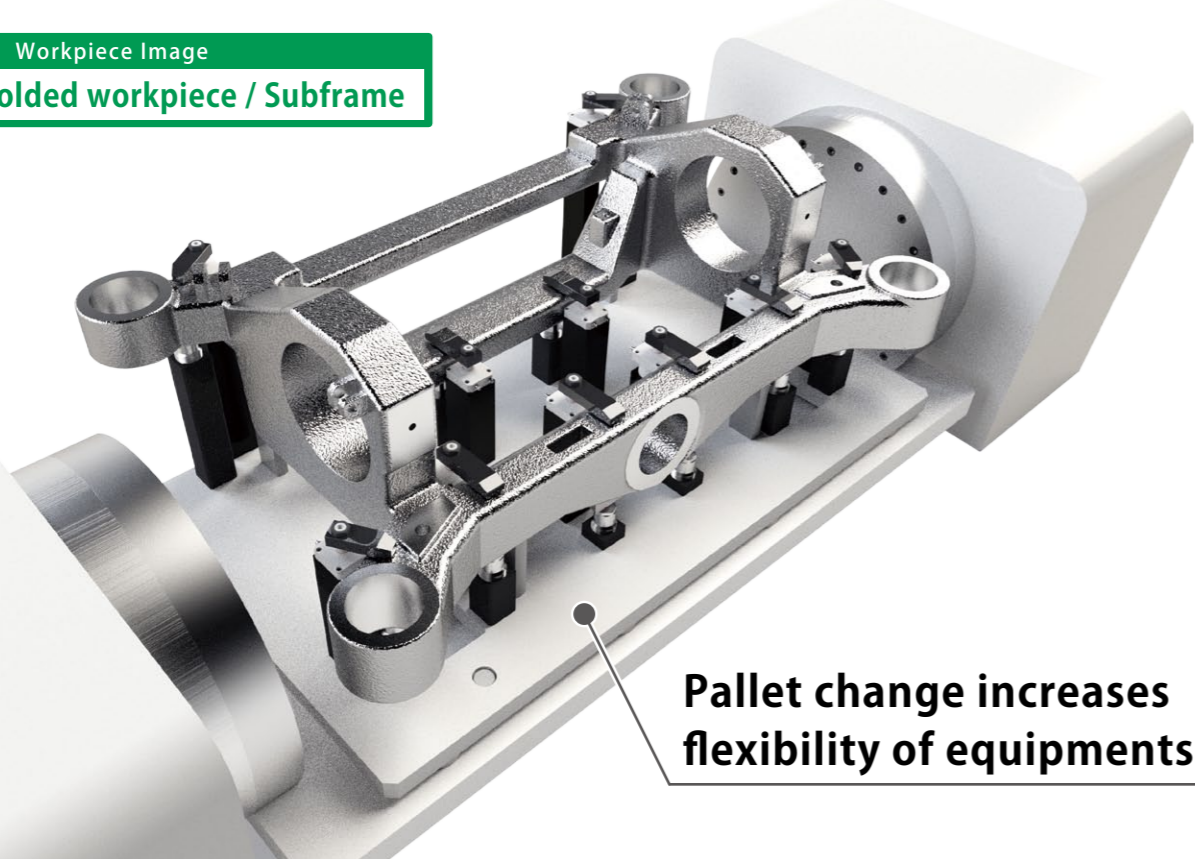


Side Surface Milling

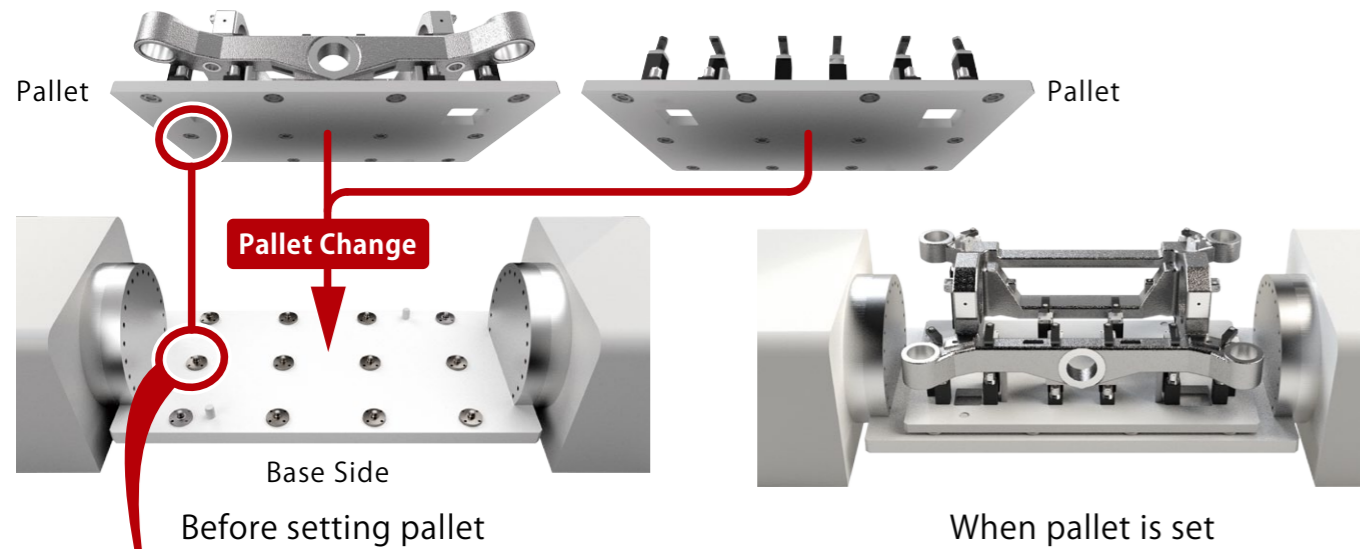


No additional machines, More workpieces by Changing Pallets.

Workpiece Image
Integrally molded workpiece / Subframe



Pallet change increases flexibility of equipments.



High-Power Pneumatic Pallet Clamp

model **WVS**

Locates and clamps simultaneously.
Powerfully locks the fixtures. Locating Repeatability : 3 μm.
Drastic setup time reduction for fixture change, pallet transfer, and outside setup.

Light-Pallet Change Enables Multi-kind Workpieces

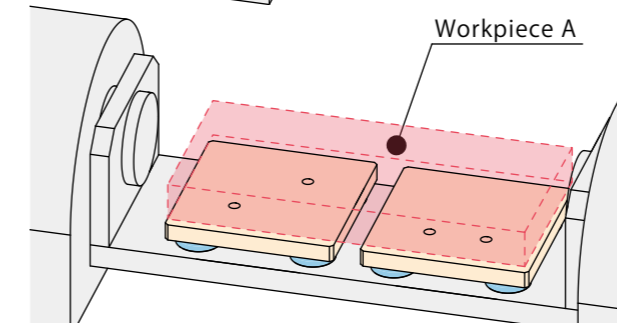
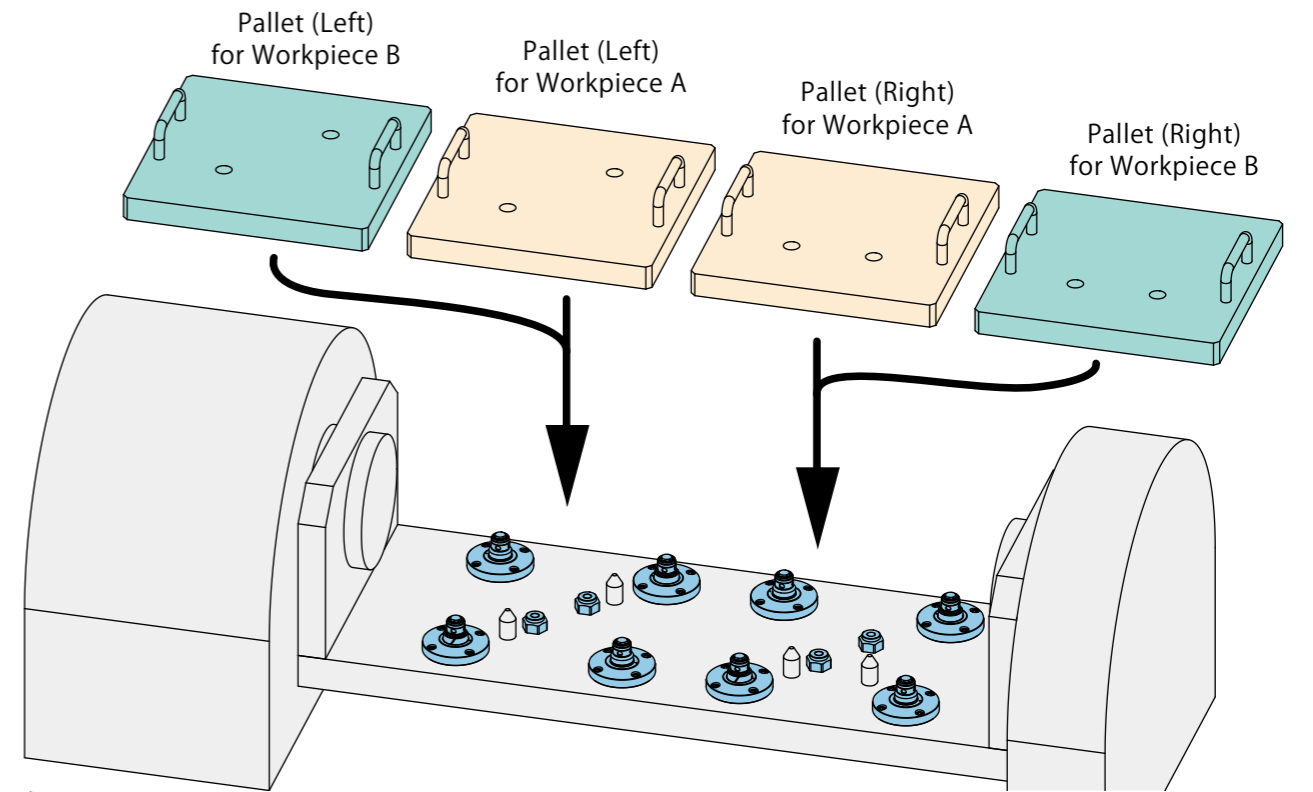
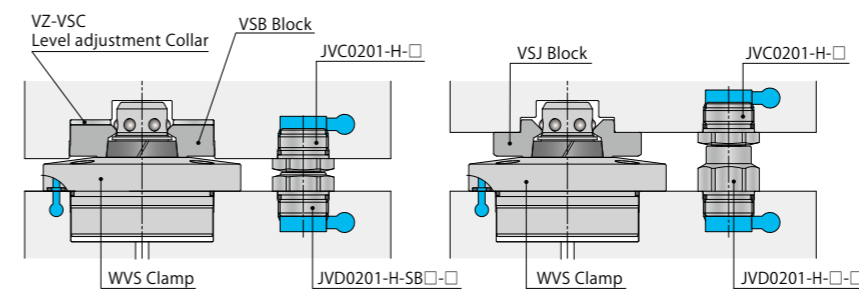
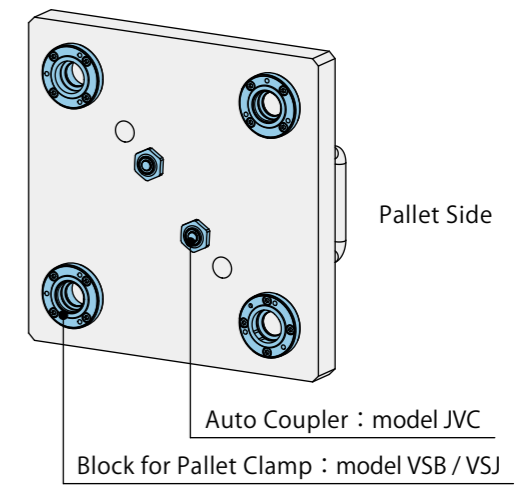
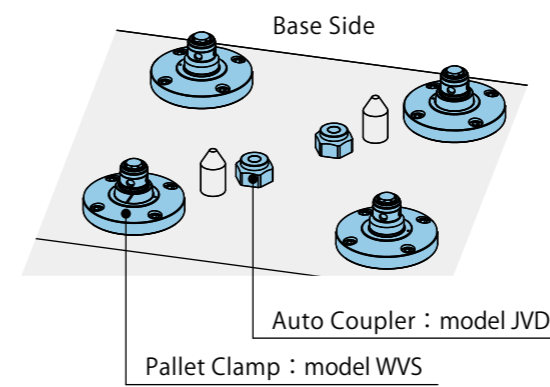


Image : Pallet Setting and Workpiece



Able to supply air pressure to the pallet side by using with Auto Coupler

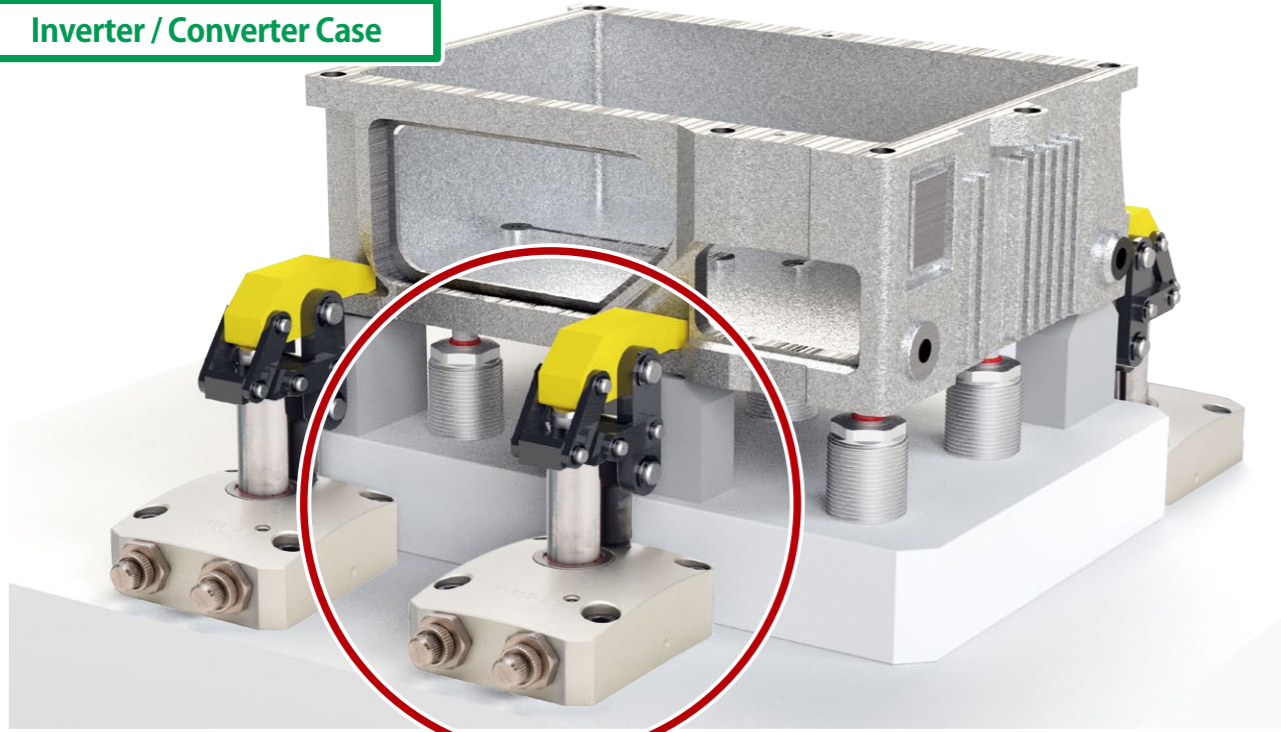


model **JVC/JVD**

**Enables to clamp difficult shape parts.
Frog clamp approaches from large amount of retraction.**

Workpiece Image

Inverter / Converter Case



High-Power Pneumatic Frog Clamp

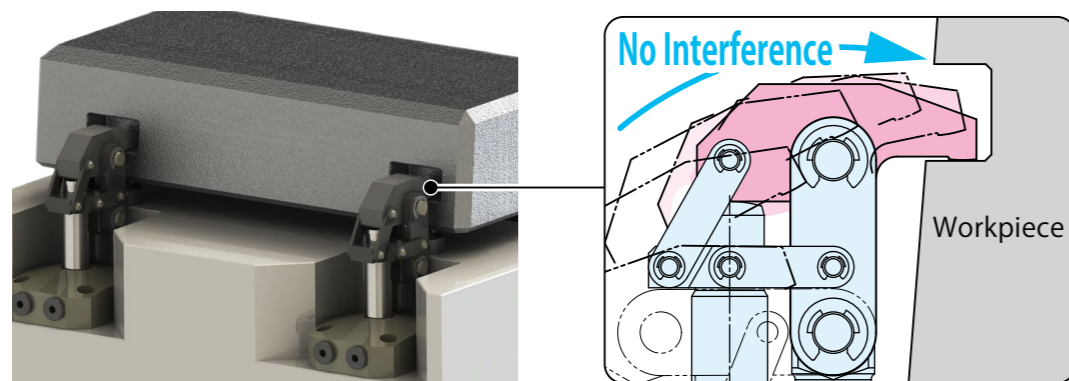
model **WFE**

Largely retracted lever avoids interference during workpiece loading/unloading.

High clamping force with pneumatic and mechanical lock system.

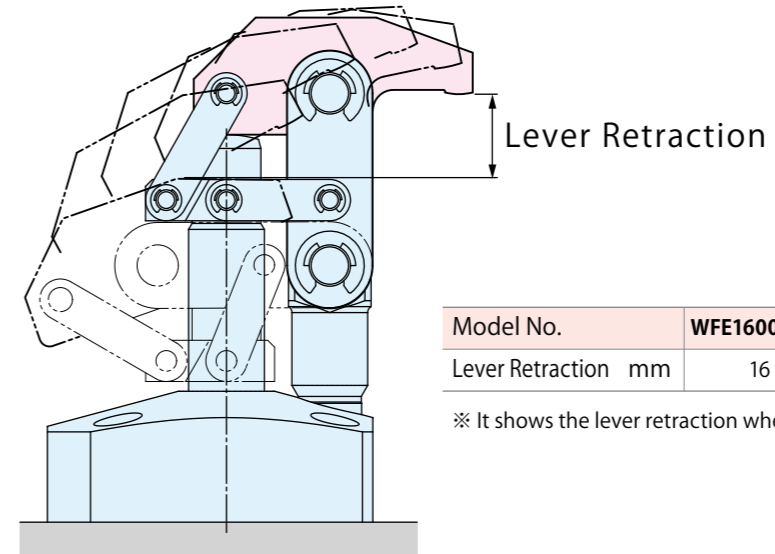
Stronger holding force with mechanical lock clamping force.

The compact lever-operating range enables to clamp difficult clamping points.



• Lever Retracted Lower than the Clamping Point

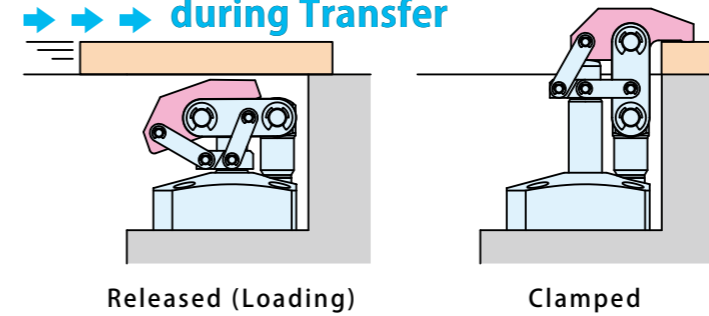
Large lever retraction allows for wide angle of loading and unloading workpieces between operations.



Model No.	WFE1600-2□□	WFE2500-2□□	WFE4000-2□□
Lever Retraction mm	16	16	24

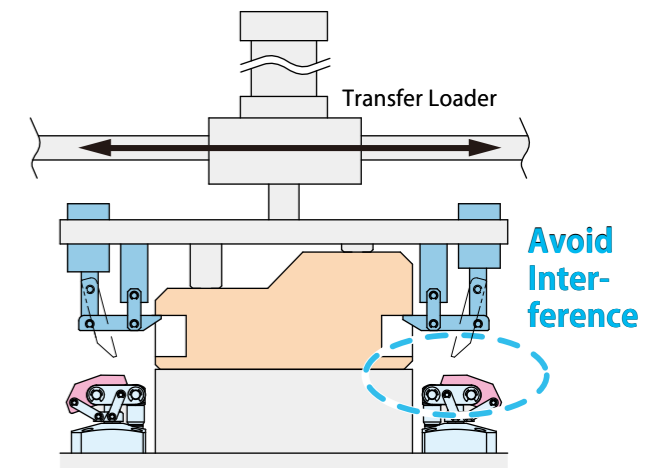
※ It shows the lever retraction when using KOSMEK option lever.

Avoid Interference during Transfer



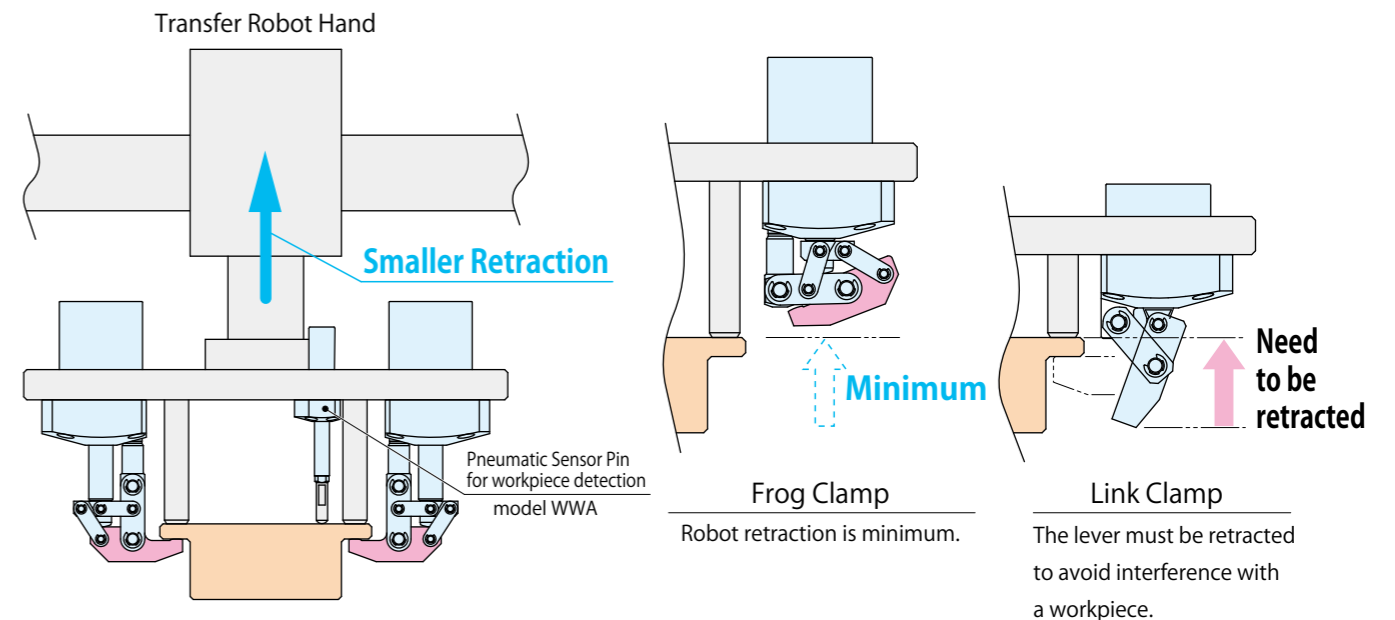
Avoid interference with a workpiece when loading and unloading

Large lever retraction allows for wide angle of loading and unloading workpieces between operations.



Avoid interference with clamps on the robot hand.

The largely retracted lever avoids interference with the work clamping lever on the transfer robot hand.



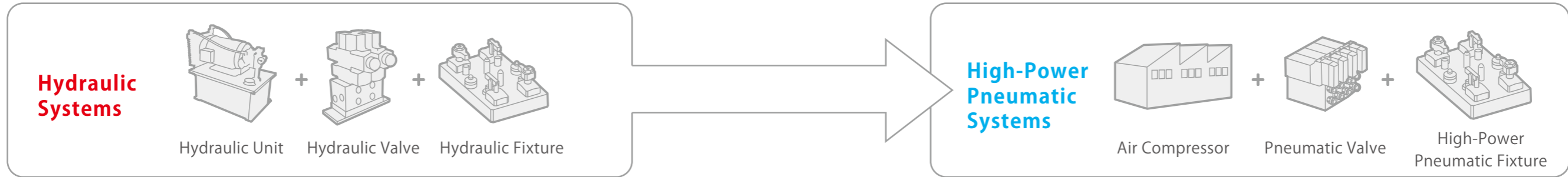
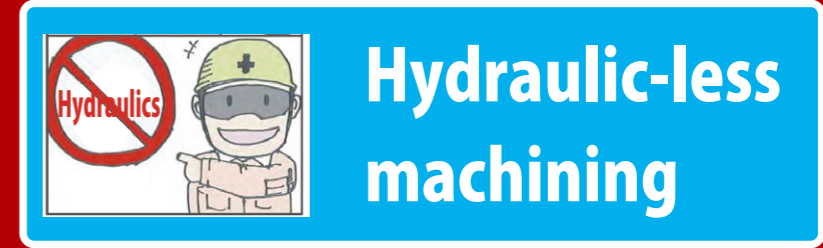
For Robot Hands

The largely retracted lever minimises robot retraction.

Advantages of High-Power Pneumatic Systems

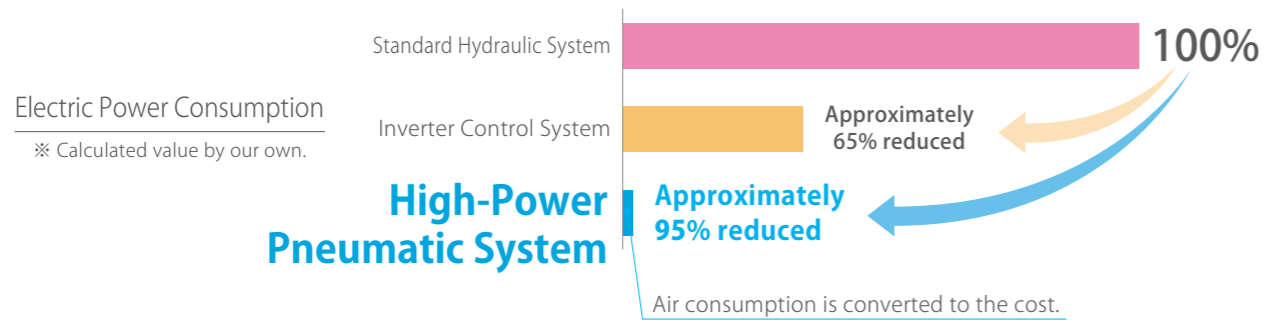
(Hydraulic Clamp → High-Power Pneumatic Clamp)

Systems



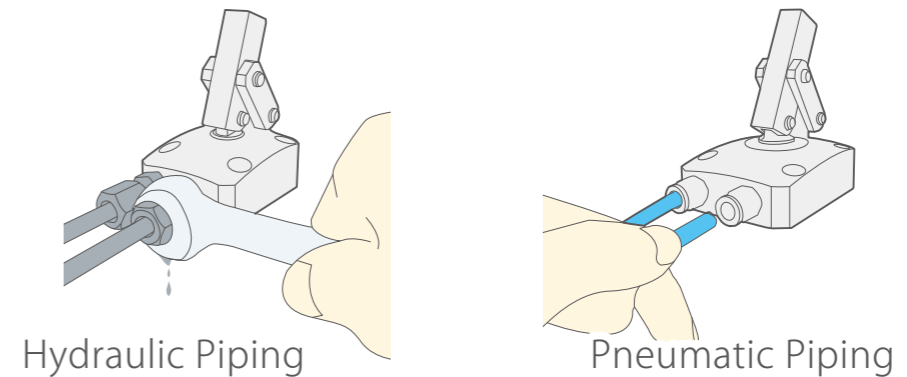
Energy-Saving

High-power pneumatic system requires only air resulting in cost reduction. No hydraulic unit required. Reduction of electric power consumption/CO2.



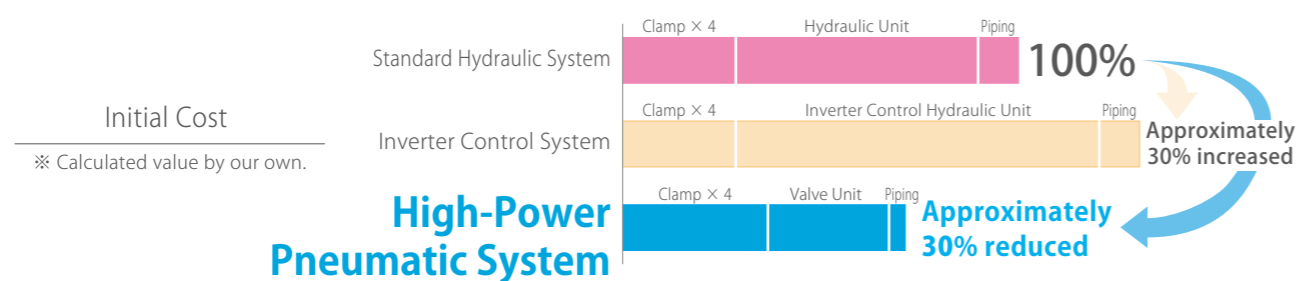
Less Workload

Installation is easily done with air piping, since there is no need of hydraulic piping. It is the solution to problems such as fluid leakage and temperature effects.



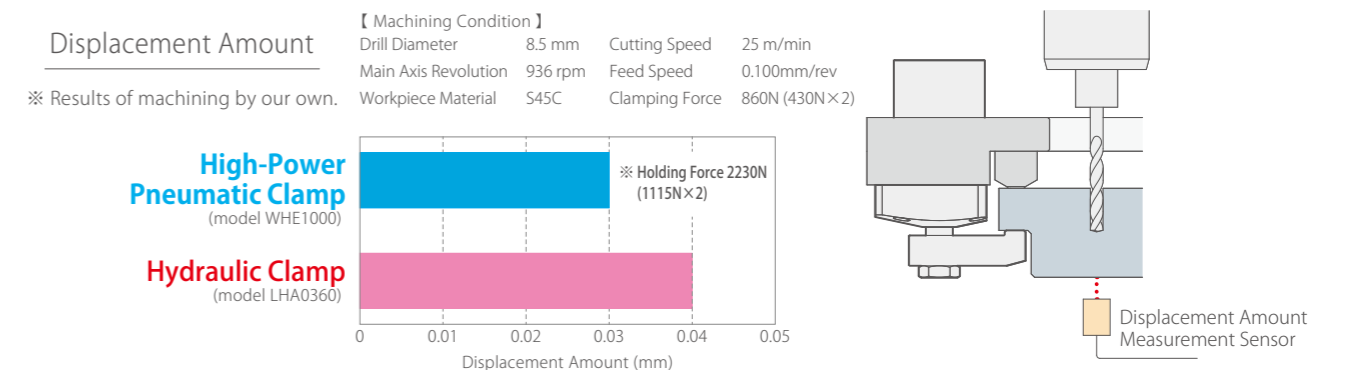
Cost-Reduction

The initial cost of high-power pneumatic system is much less than that of hydraulic system. The running cost is also reduced with less maintenance.



High Power

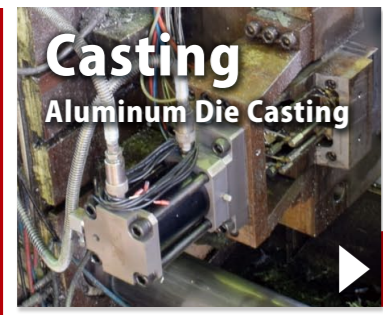
Holding force with mechanical locking (wedge) function withstands the reaction force similar to hydraulic clamps. Also, it enables high speed machining on both front and back faces.



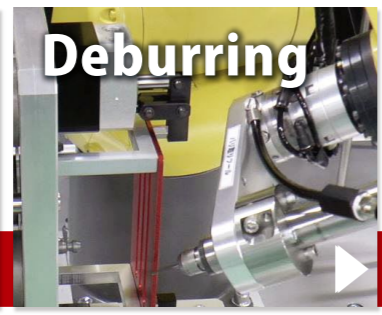
KOSMEK Products to Enhance

Productivity in Every Process

Casting Components



- Die Clamping Cylinder
- High-Speed Core Pull Cylinder

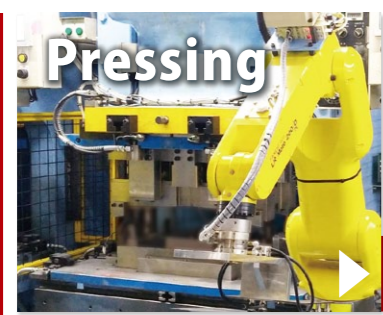


- Work Clamp
- Robotic Hand Changer



- Work Clamp
- Expansion Locating Pin
- Pallet Clamp
- Non-Leak Valve • Coupler
- Rotary Joint

Sheet Metal Components

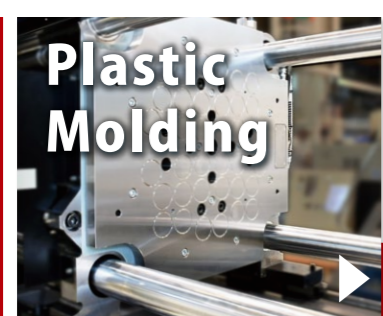


- Die Clamping Cylinder
- Robotic Hand Changer

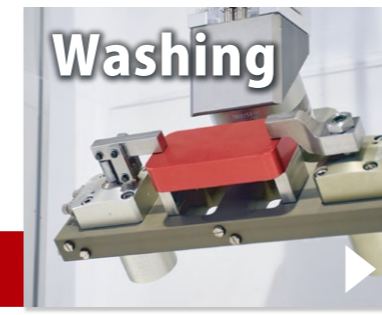


- Work Clamp for Welding Equipment
- Robotic Hand
- Robotic Hand Changer

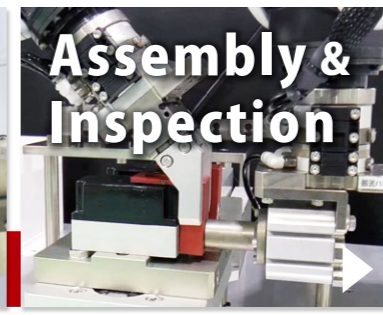
Resin Components



- Mold Clamping Device
- Robotic Hand Changer

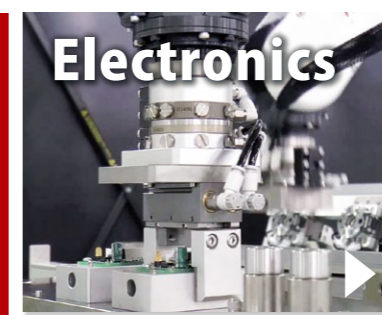


- Work Clamp for Washing Equipment
- Robotic Hand
- Robotic Hand Changer



- Pneumatic Clamp
- Expansion Locating Pin
- Robotic Hand Changer
- Auto Coupler
- Compliance Module
- Smart Series

Electronic Components



- Robotic Hand
- Expansion Locating Pin
- Robotic Hand Changer



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