

High-Power Pneumatic Pallet Clamp

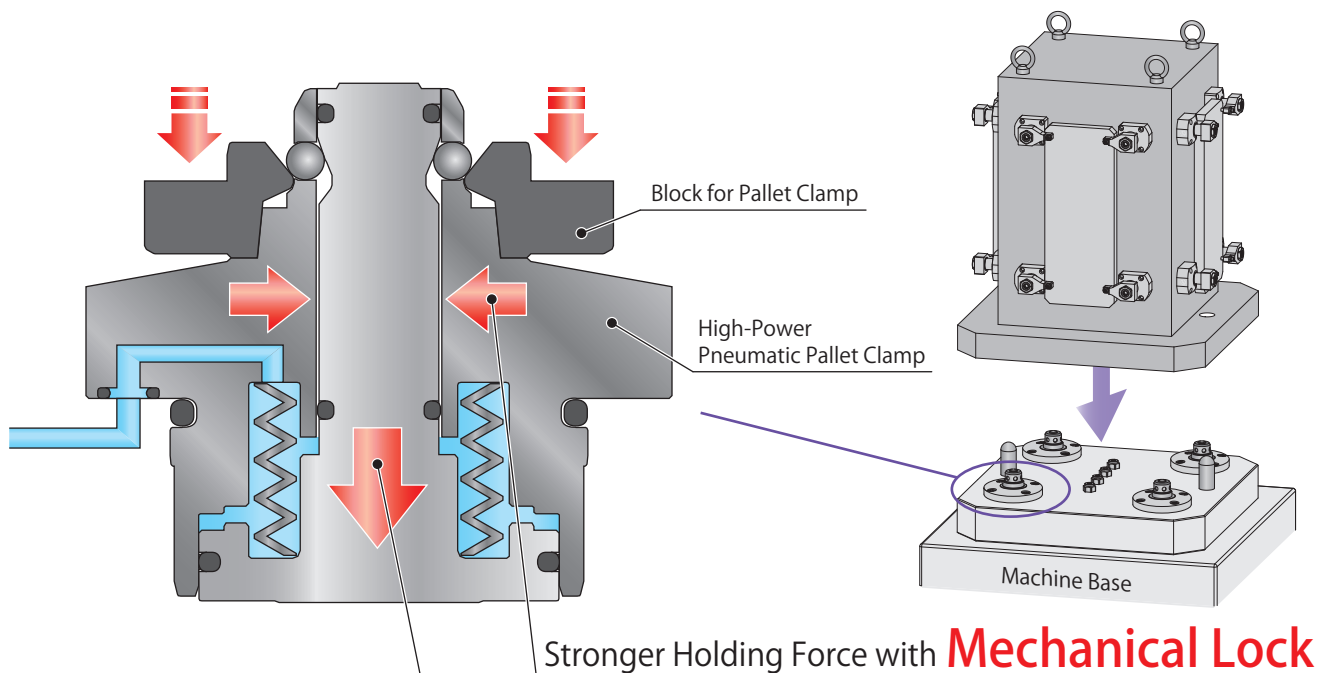
Model WVS



Clamping force which replaces hydraulic clamp
Development of high power pneumatic pallet clamp PAT.P.

Available in four body sizes cylinder output force is

4kN / 6kN / 10kN / 16kN



With Mechanical Lock Function

Clamping force which replaces hydraulic clamp

※Clamping force varies depending on the operating pressure.
※This drawing is images. The parts constitution is different.

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

High-Power Pneumatic Work Support

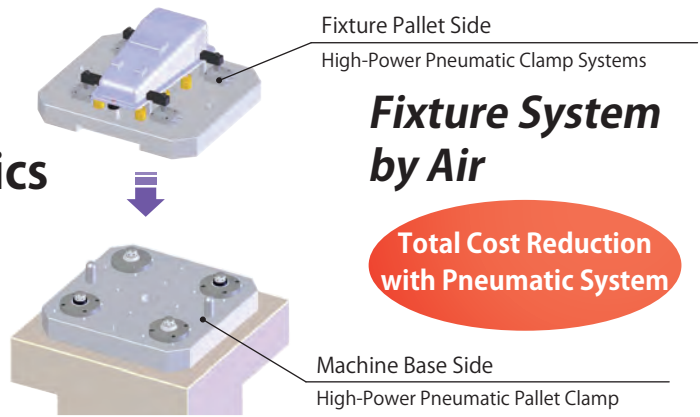
WNC

High-Power Pneumatic Pallet Clamp

WVS

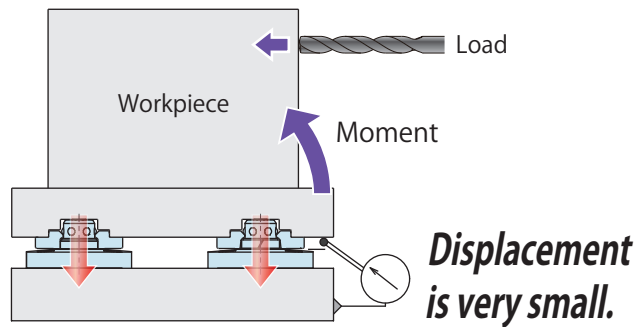
● **Elimination of Hydraulics**

The hydraulic power pack and clamping systems can be eliminated by using pneumatic systems.



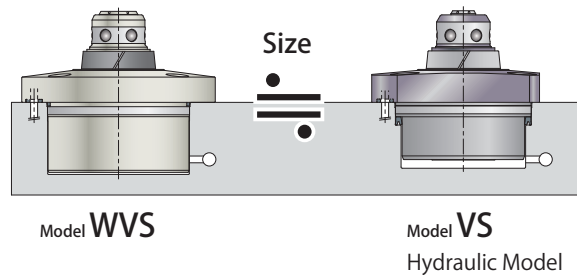
● **High Rigidity**

Clamping force is suppressed to necessary minimum by the powerful holding force beyond clamping force.



● **Compact**

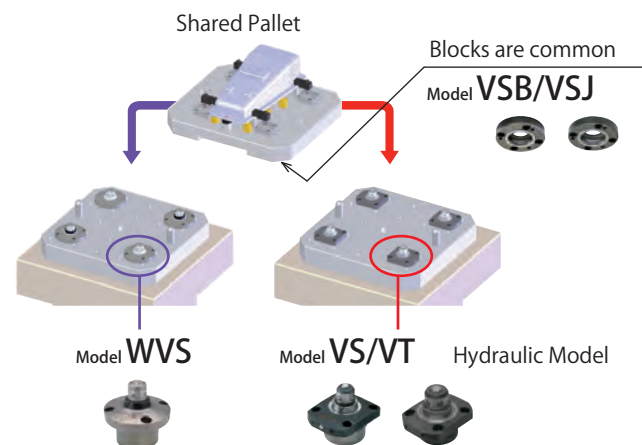
WVS is size same as a hydraulic clamp (model VS). It withstands high cutting load.



※ Please contact us when you have concern with the transverse load data.

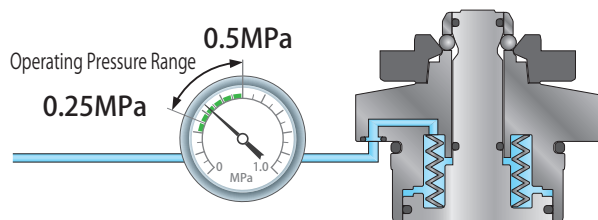
● **Shared Pallets**

The block attached to the pallet side is common with WVS clamp and hydraulic clamp (VS/VT).



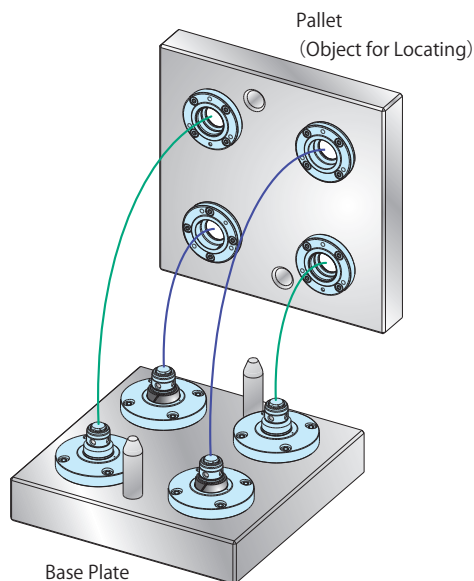
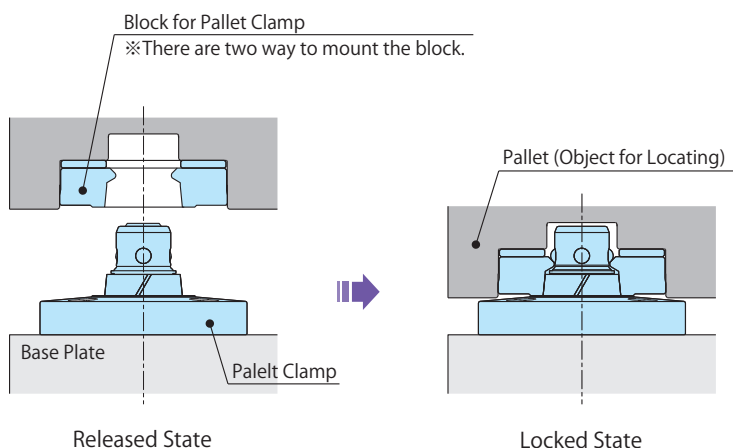
● **Energy Saving**

Higher clamping force achieved by low operating pressure. No need to use air booster.



Function Description

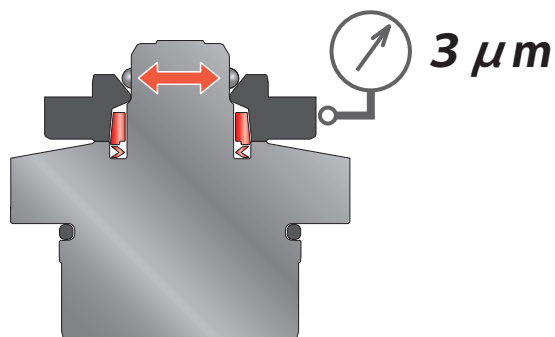
※Refer to the P.151 for detail.



Repetitive Locating with High Accuracy

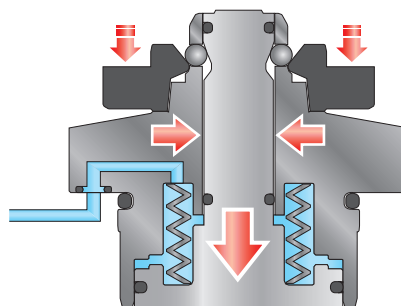
Locating Repeatability : $3 \mu\text{m}$

Fixture alignment inspection is eliminated in the machining center.



Clamping Function

Clamping force is ranged from $2.4\text{kN} \sim 15.7\text{kN}$.
Strong clamping force.

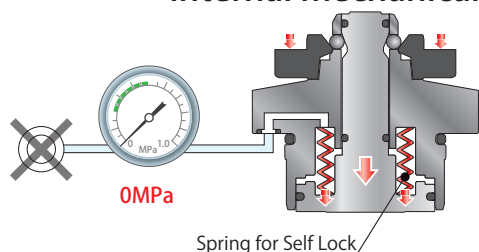


Self Lock (Safety) Function

(Holding force when air pressure becomes zero)

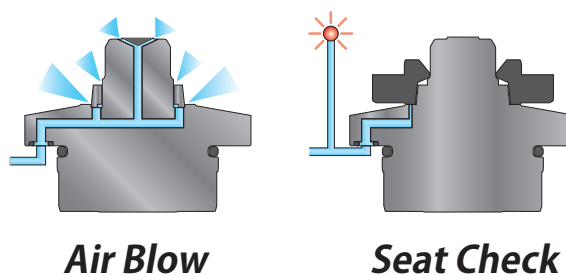
The internal mechanical lock operates and clamping force and holding force achieved. When pneumatic pressure is at zero, it will stay locked due internal mechanical lock.

It will stay locked with internal mechanical lock.



Air-Blow and Seat Check

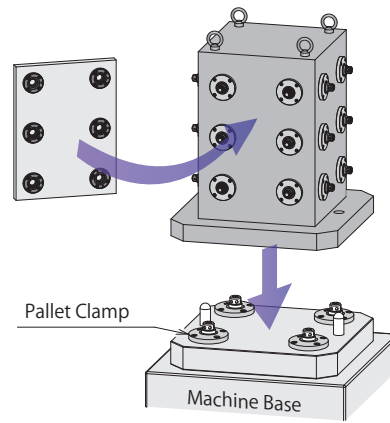
Foreign substance is removed by air blow. Seating surface is provided with the air hole, seat check is possible if gap sensor is used.



● Advantages

● Higher Productivity by Setup Improvement

Instant clamping & Precise repeat accuracy.
(Fixture alignment & inspection is eliminated)
Fixture change over is faster & easier, thus by eliminating alignment inspection for accuracy which is done in many different ways.



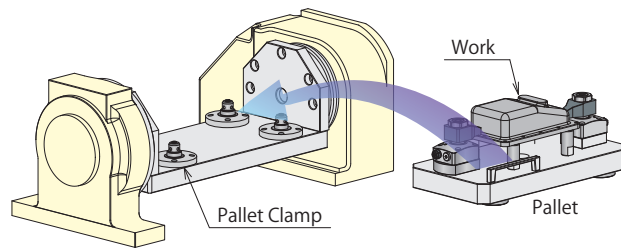
Pallet and Fixture Change Over on Machining Center

Preparation Time

Substantial Reduction

● Efficient use of machine by eliminating non-productive time like fixture setting etc is done outside.




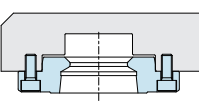
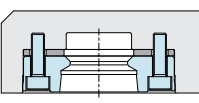
Since the fixture setting is outside, the machine idle time is reduced.



Manual Pallet Change

Pallet sharing system is very efficient for many variants with small batch production requirements.

Pallet alignment is **Instant**

	 Model WVS → P.161	 Model VSJ → P.165	 Model VSB → P.163
Classification	Double Action Air Lock / Air Release	Flange Shaped Block	Embedded Block
Operating Pressure Range	0.25~0.5MPa	—	—
Features	<ul style="list-style-type: none"> Strong Clamping Force With Self Lock by Spring 	 Simple Mounting	 Straight Mounting
Accessories	—	—	The sequence of collar used for Level Adjustment (VSB only) VZ-VSC → P.163

High-Power Series

- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

High-Power Hydraulic Swing Clamp
LHE

High-Power Hydraulic Link Clamp
LKE

High-Power Pneumatic Hole Clamp
SWE

High-Power Pneumatic Swing Clamp
WHE

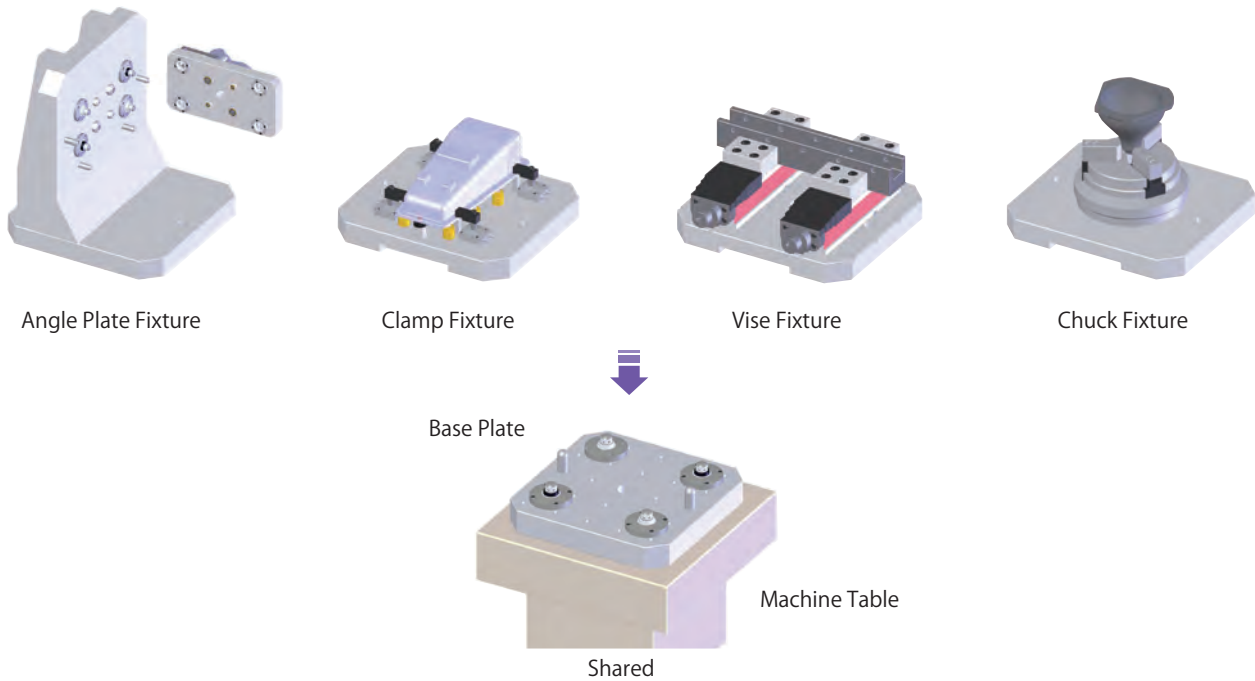
High-Power Pneumatic Link Clamp
WCE

High-Power Pneumatic Work Support
WNC

High-Power Pneumatic Pallet Clamp
WVS

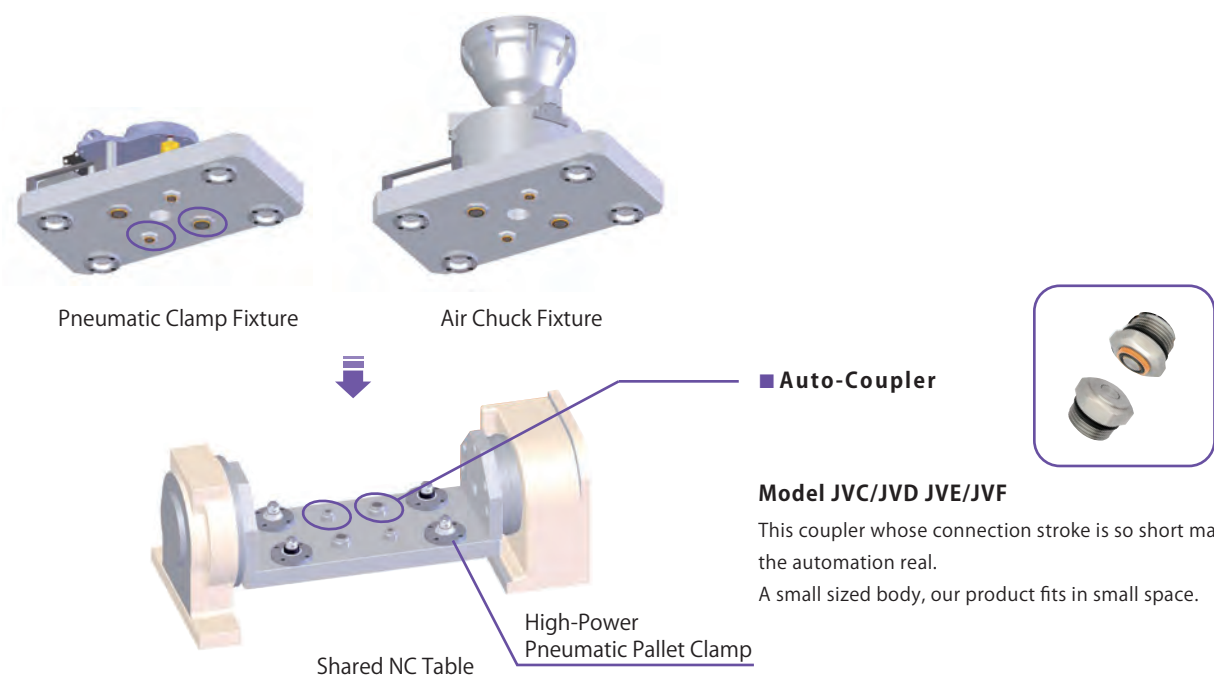
● Installation Example on the Machining Center

- With combination of machining center and pallet clamp, multiple fixtures and works become easily interchangeable.
- Internal setup time can be reduced with high precision repetitive positioning of pallet clamp + one touch clamping.
- If common layouts are used, fixture count and required machines can be minimized saving cost and space.



● Installation Example on NC Table

- With combination of NC table and pallet clamp, multiple fixtures and works become easily interchangeable.
- Hydraulic pressure, air pressure and coolant can be supplied to the fixture with the use of zero setting force type auto-couplers.



It is selectable from 3 type pallet clamp (VS / VT / WVS) according to application.

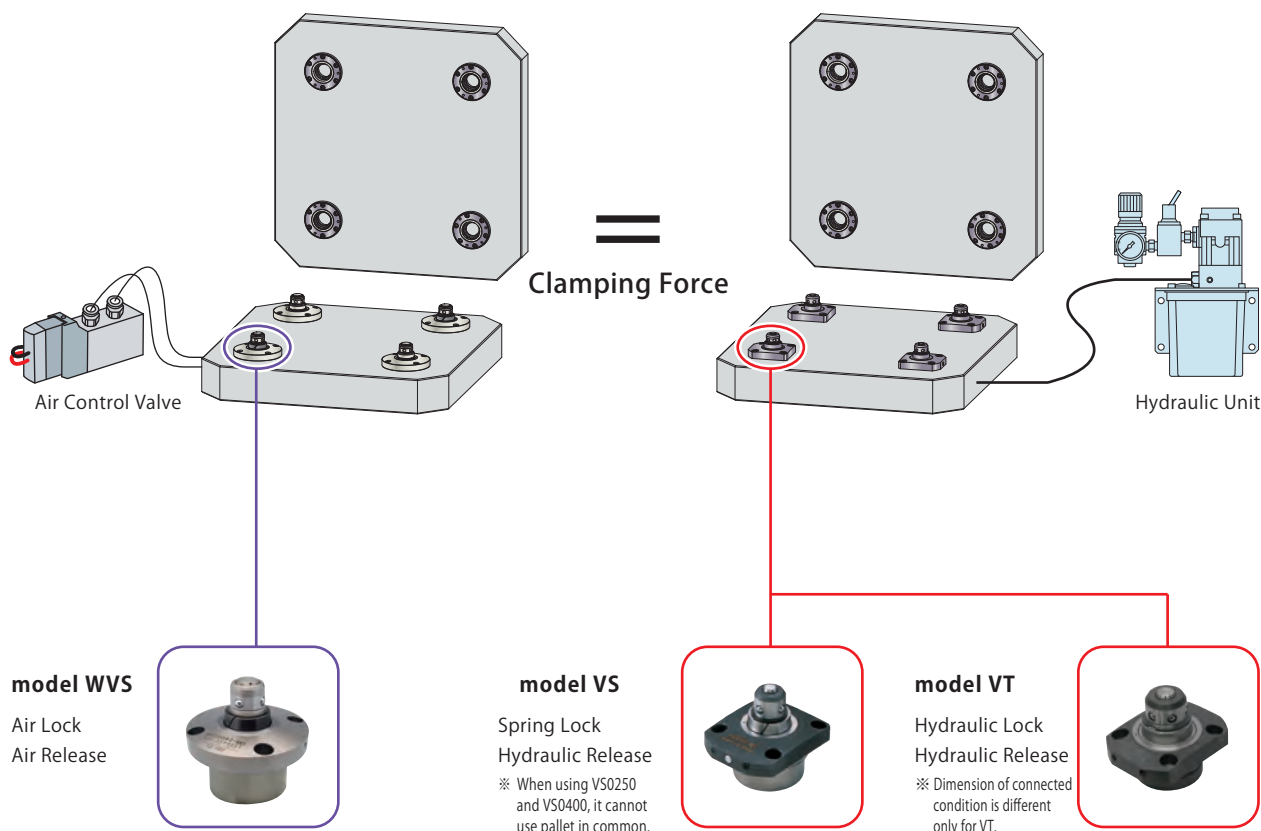
- The block attached to the pallet side is common with WVS clamp and hydraulic clamp (VS/VT). Hence, Spring of pallet with the WVS, VS or VT clamps attached becomes easy and compatible. Appropriate clamp can be selected depending on the application.

All Pneumatic Systems

- For the condition that is not allowed to use oil
- For the manufacturing process that is operated by high cutting load
- For inspection and assembly line

Hydraulic Systems

- For the condition that is allowed to use oil
- For the manufacturing process that is operated by high cutting load



※ The detail form for combination is described at WVT(VS/VT)-VSB/VSJ block compatible table (P.155) .

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp
LHE

High-Power Hydraulic Link Clamp
LKE

High-Power Pneumatic Hole Clamp
SWE

High-Power Pneumatic Swing Clamp
WHE

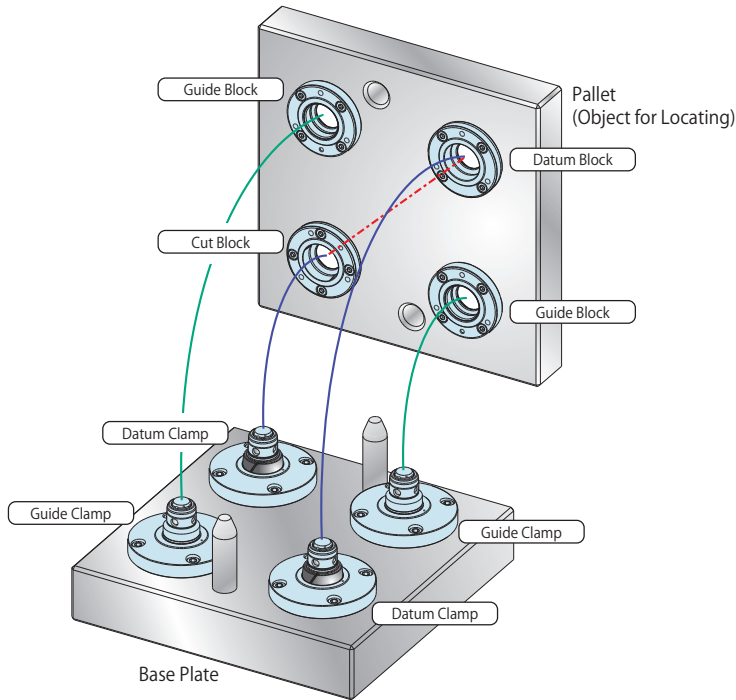
High-Power Pneumatic Link Clamp
WCE

High-Power Pneumatic Work Support
WNC

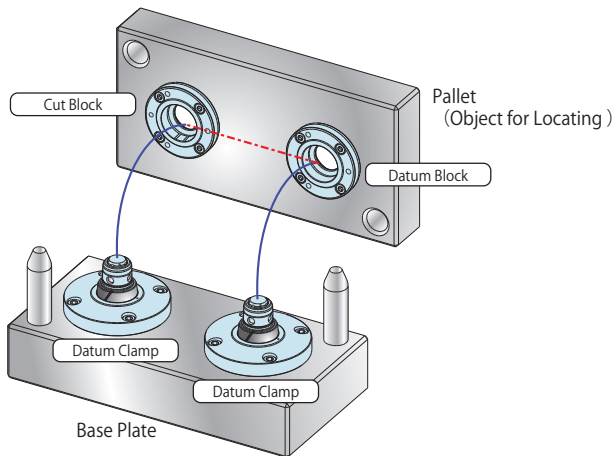
High-Power Pneumatic Pallet Clamp
WVS

System References

At the time of four use



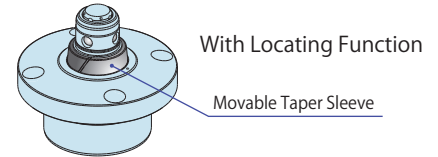
At the time of two use



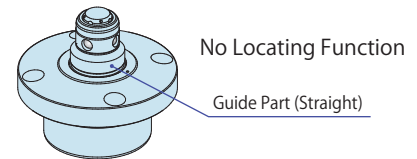
Apparatus and Function

※ For Information about combination between clamps and blocks, please look at the P.155 .

Datum Clamp



Guide Clamp



Datum Block



Cut Block



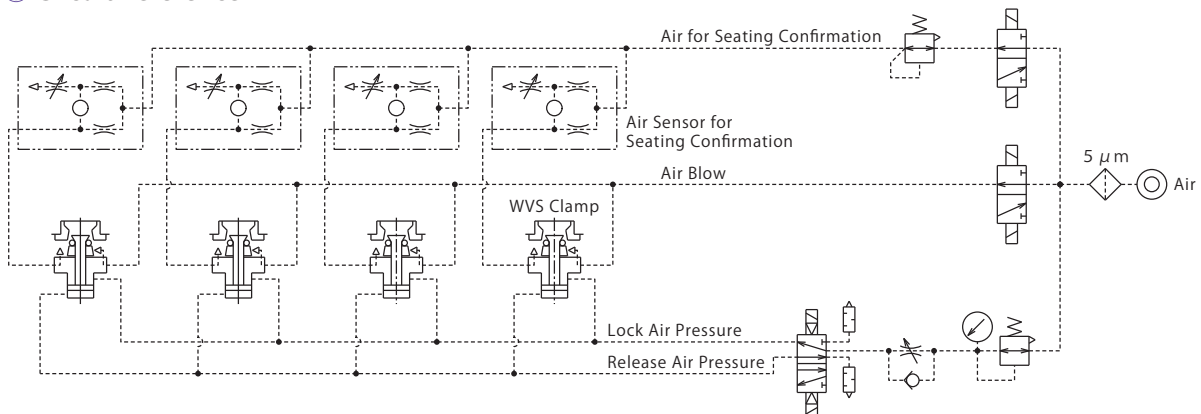
※ In the case of installation, only cut block requires attention in phase. Please refer for the details separately.

Guide Block



※ Free block do not have a guide function.

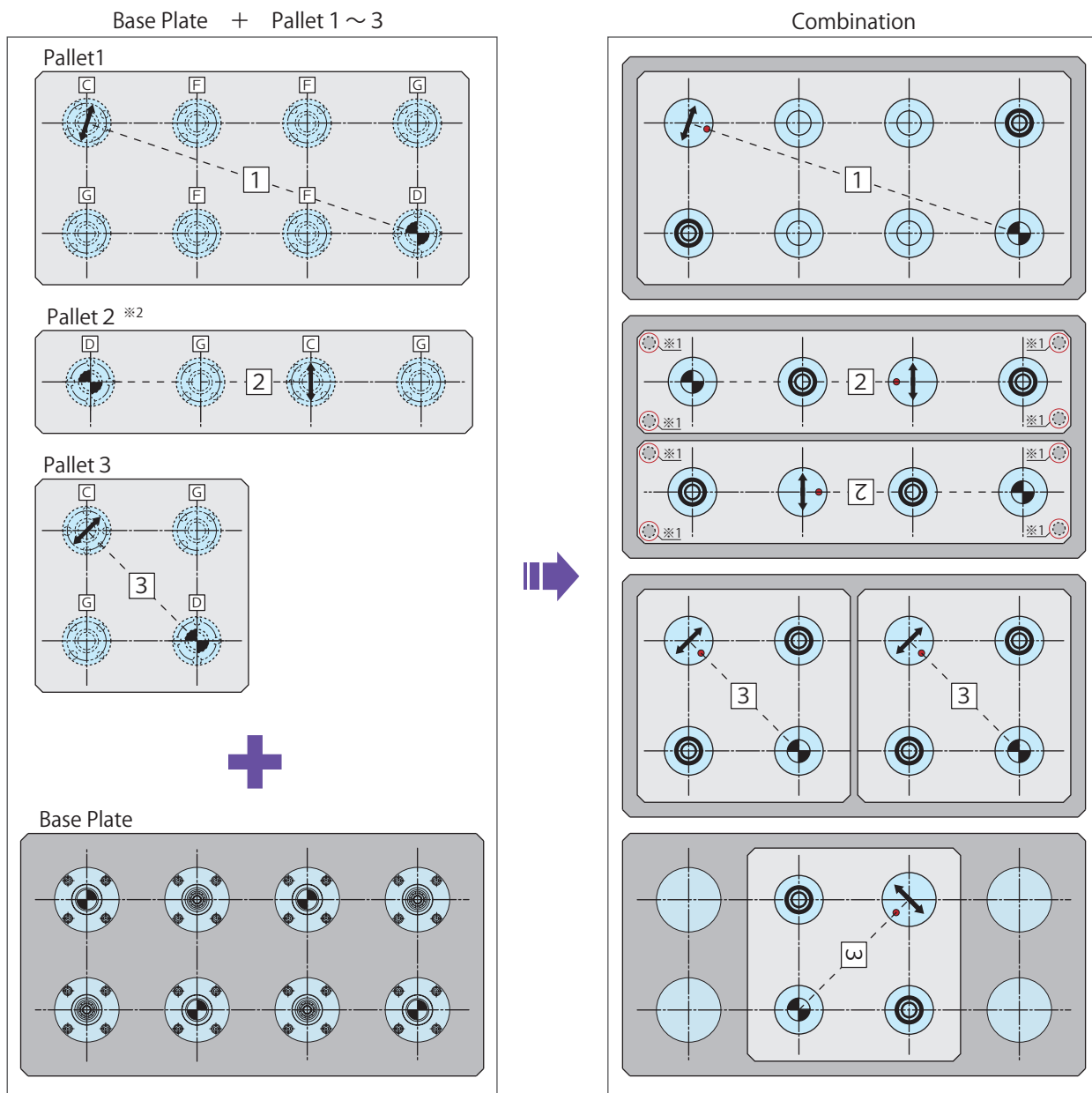
Circuit Reference



Note 1. It is recommended to use air blow line with at least $\phi 6$ in order to ensure effective air flow. Please supply clean filtered air.

Configuration sample when multiple pallet sizes are used together

In case there are a variety of pallets with different sizes for the base plate, the clamp and block can be combined for use.



Combination of Clamp and Block

Equipment installed on the base plate	+	Equipment installed on the pallet	⇒	Functions when they are combined
	+		⇒	Clamping Function + Locating Function (Reference Point)
	+		⇒	Clamping Function + Locating Function (One Direction)
	+		⇒	Clamping Function + Guide Function
	+		⇒	Clamping Function

Notes

- ※1. In case the clamp/block configuration is linear, it is recommended to provide additional supports for stability.
- ※2. The spring pin position is indicated. With the datum block as reference, unidirectional positioning is done via the cut block. The cut block positioning plane must be tangent to the datum block. (The spring pin is positioned on the line connecting the centers of the datum block and cut block.)

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

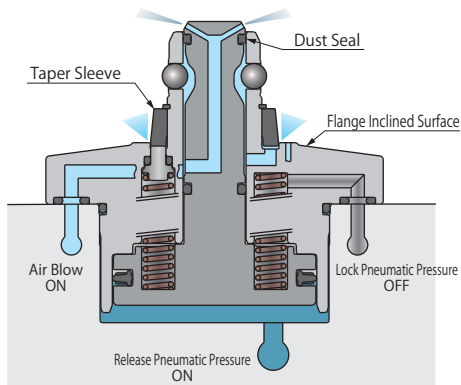
High-Power Pneumatic Work Support

WNC

High-Power Pneumatic Pallet Clamp

WVS

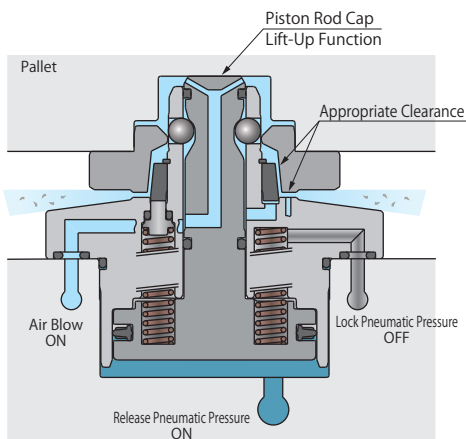
Action Description ※ This is a simplified drawing. Actual components are different.



Before Loading the Pallet

- Air blow prevents debris contamination.
- Dust seal prevents foreign objects from entering and keeps steel ball area clean.
- The flange top is designed as inclined surface so that cutting powder and cutting oil can flow easily.
- The slitting part of taper sleeve (one place) is protected with lever plate to prevent invasion of cutting powder.

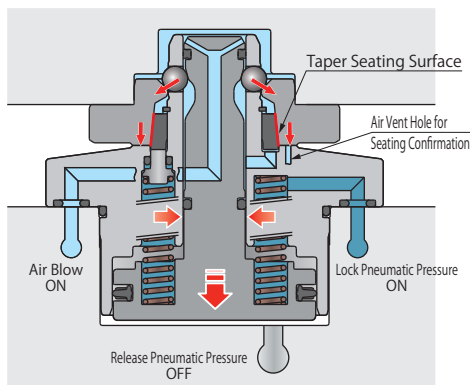
After Unloading the Pallet



When Loading the Pallet

- When the pallet is transported in
- The pallet is set on the raised piston rod cap.
- At this time there is clearance between the datum surfaces allowing air flow to remove contaminants.
- This allows to effectively remove chips and cutting oil by the air blower.
- When the pallet is transported out
- The close contacting of taper seating surface is released with lift-up force.

When Unloading the Pallet



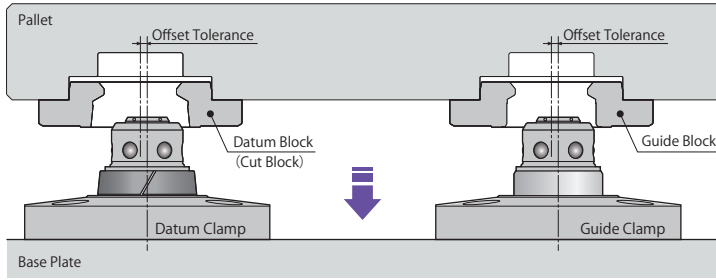
When clamped

- When release air pressured is OFF and lock pneumatic pressure is ON, the pneumatic pressure and the spring force, mechanical lock mechanism lowers the piston rod and the steel balls engage the block bringing it to the seating surface. (It holds the condition by mechanical lock function.)
- The pallet is positioned with high precision via the taper sleeve as it contacts the taper surface of the block.
- The seating surface includes an air vent for seating confirmation (via air catch sensor).

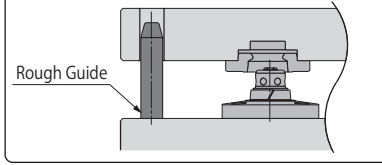
When clamped

● Action Description during Loading/Unloading

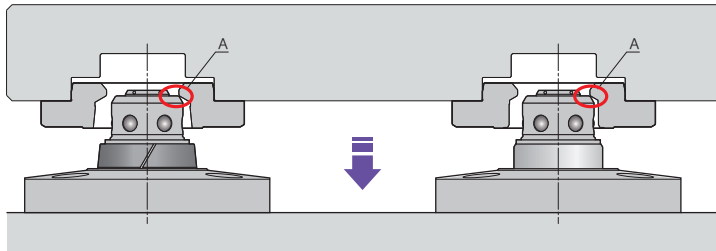
1. Pneumatic pressure releases the clamp. Position of pallet while loading must be kept within the allowable eccentricity.



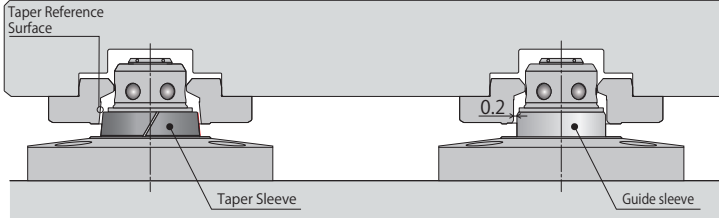
It is recommended to use rough guides to contain the pallet within the allowable eccentricity.



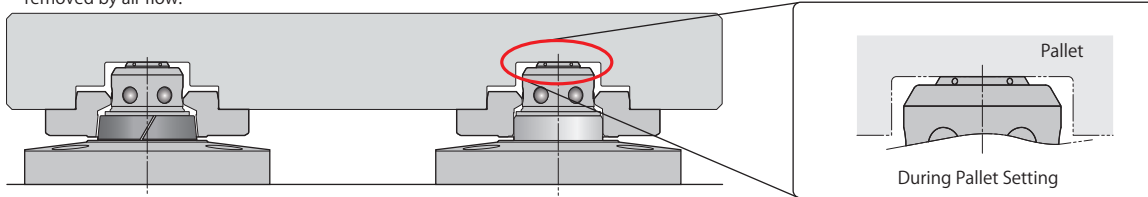
2. When the pallet is lowered, it should be positioned so the blocks contact the rod as shown on A.



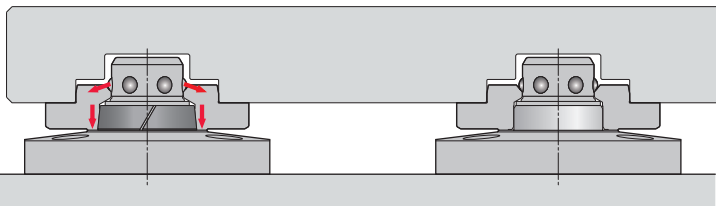
3. As the pallet is further lowered, it is positioned within 0.2mm of the reference axis via the guide sleeve and guide block.



4. Loading is finished when pallet is resting on piston rod. At this time there is clearance for air flow to clean the taper surfaces.
At this time, the appropriate clearance between seating surface and taper reference is created by lift up function, which makes it thus more effective that the cutting chips are removed by air flow.



5. When the release pneumatic pressure is OFF and the lock pneumatic pressure is ON, the block is pressed on the seating surface with pneumatic pressure and clamp spring, mechanical lock mechanism. When the block is pressed, the taper reference surface is contacted for locating.



High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

High-Power Pneumatic Work Support

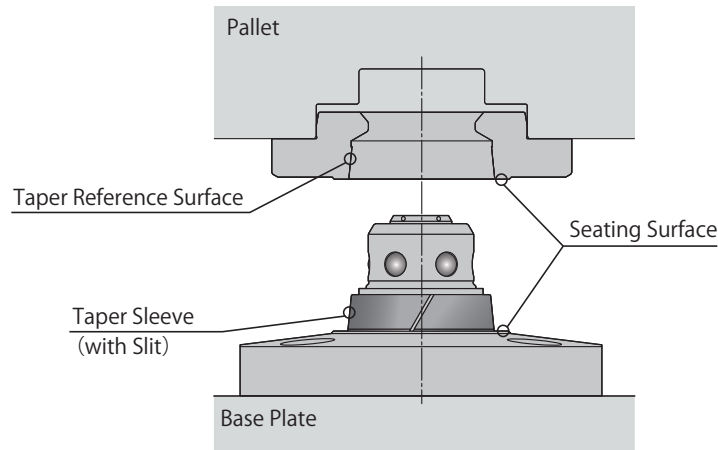
WNC

High-Power Pneumatic Pallet Clamp

WVS

● Description of Movable Taper Sleeve

Locating Method: Dual Surface with Movable Taper Sleeve



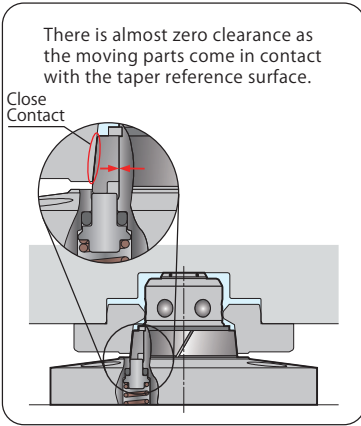
The Benefits of Movable Taper Sleeve

With marginal error absorbed by the moveable taper sleeve, the clearance between the clamp unit, taper sleeve and block is eliminated enabling the repetitive location accuracy and stabilized clamping force.

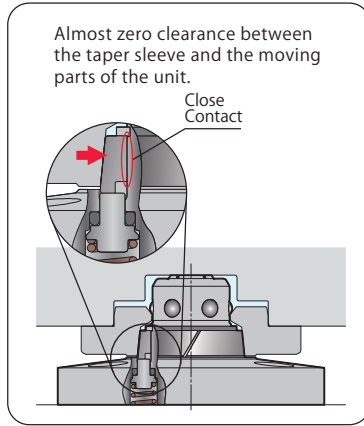
- ① Absorbs tolerance variations in each location clamp and block .
- ② Absorbs wear of locating part due to long time use.
- ③ Absorbs space variations of mounting holes.
- ④ Absorbs space variations due to temperature change.

Movement and Error Absorbed by the Movable Taper Sleeve (①/②)

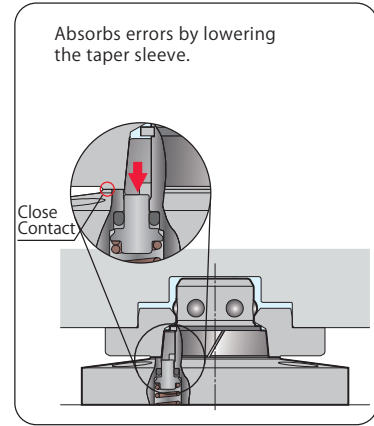
Starting of Action for Locating



XY Locating



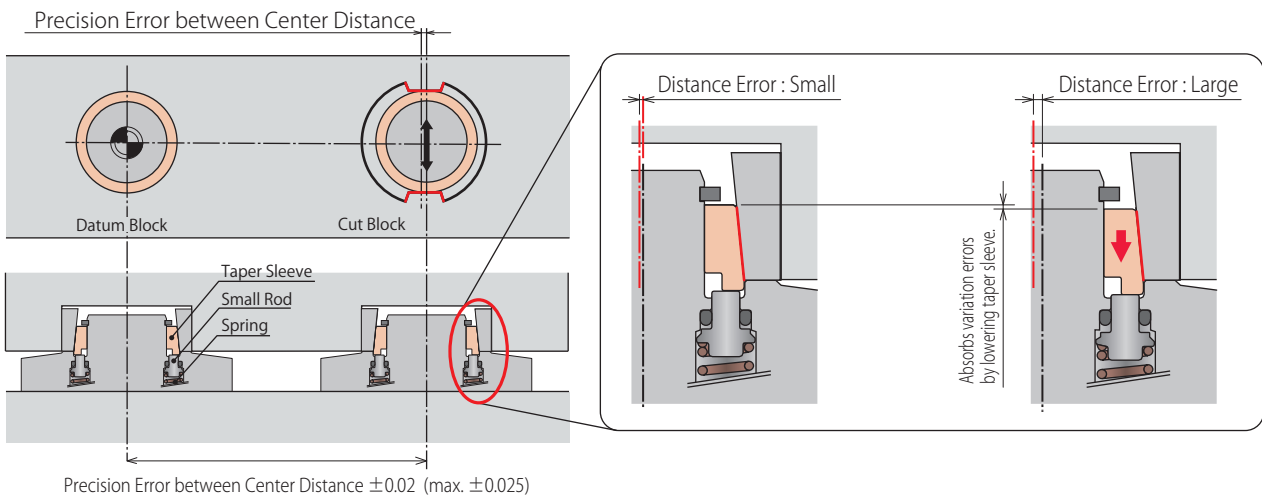
XYZ Locating



Movable taper sleeve absorbs distance error. (③/④)

Absorbs distance variations minimizing the wear of locating parts and prevents deformation of clamp/block.

※The precision assurance function is absolutely necessary especially when plates are transported or multiple fixture changeovers are needed.



Model No. Indication (Clamp)

WVS 0 06 0 - M D

06
0
D

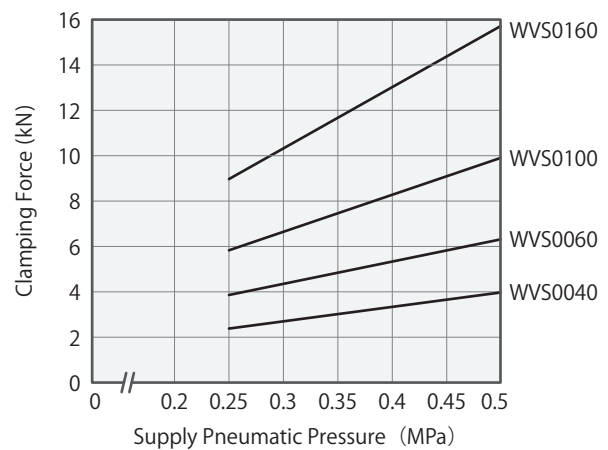
1
2
3

1 Clamping Force

- 04** : Clamping Force 4.0kN (Pneumatic Pressure 0.5MPa)
- 06** : Clamping Force 6.3kN (Pneumatic Pressure 0.5MPa)
- 10** : Clamping Force 9.9kN (Pneumatic Pressure 0.5MPa)
- 16** : Clamping Force 15.7kN (Pneumatic Pressure 0.5MPa)

※ Refer to clamping force.

Refer to Performance curve and Specification.



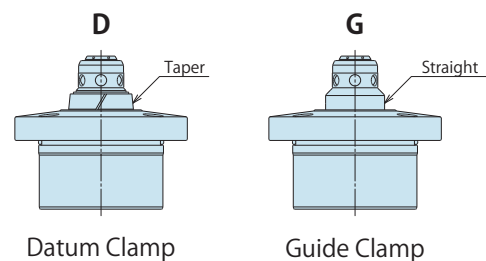
2 Design No.

0 : Revision Number

3 Functions

D : Datum Clamp (Especially Used for Locating)

G : Guide Clamp (Especially Used for Guide)



Combination of Clamp and Block

Clamp model	Block model	Function
WVS-MD (Datum Clamp)	VSB□-D / VSJ□-D (Datum Block)	Clamping + Locating at a Reference Point
WVS-MD (Datum Clamp)	VSB□-C / VSJ□-C (Cut Block)	Clamping + One Direction Locating
WVS-MG (Guide Clamp)	VSB□-G / VSJ□-G (Cut Block)	Clamping + Guide
WVS-M□ (Datum / Guide Clamp)	VSB□-F / VSJ□-F (Free Block)	Clamping

Notes

1. Please refer to follows of [WVS (VS/VT) - VSB/VSJ block compatible lists] for the detailed form of the combination.

WVS (VS/VT) - VSB/VSJ Block Compatible Lists

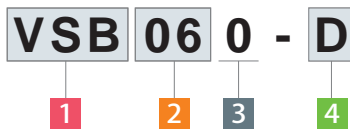
Clamp Model	WVS0040	WVS0060	WVS0100	WVS0160
Block Model	VSB020	VSB060	VSB100	VSB160
(Material : SCM)	VSJ020	VSJ060	VSJ100	VSJ160
(Hydraulic Clamp Model No.)	(VS0040)	(VS0060)	(VS0100)	(VS0160)
	(VT0040)	(VT0060)	(VT0100)	(VT0160)

Notes

1. The function is described at combination of clamp and block.
2. WVS and Block (VSB/VSJ) for Hydraulic clamp (VS/VT) are common.

Model No. Indication (Block)

VSJ : Flange Shaped Block



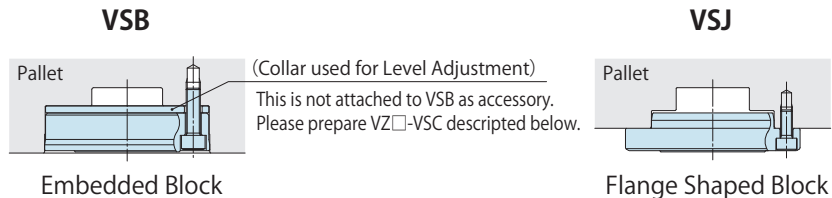
VSJ : Flange Shaped Block



1 Shape of Block

VSJ : Embedded Block

VSJ : Flange Shaped Block



2 Accommodate WVS/VS/VT Clamp Model

02 : WVS0040 / VS0020 / VS0040 / VT0040

06 : WVS0060 / VS0060 / VT0060

10 : WVS0100 / VS0100 / VT0100

16 : WVS0160 / VS0160 / VT0160

Notes

- VS/VT is hydraulic model.

3 Design No.

0 : Revision Number

4 Functions

D : Datum Block (Especially Used for Reference Locating)

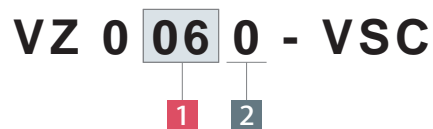
C : Cut Block (Especially Used for One Direction Locating)

G : Guide Block (Especially Used for Guide)

F : Free Block (Shared by Multiple Pallets with Different Sizes)

Model No. Indication (Spacer for Level Adjustment)

※This product is only for VSJ's embedded block.



1 Accommodate VSJ Block Model No.

02 : VSJ020-□

06 : VSJ060-□

10 : VSJ100-□

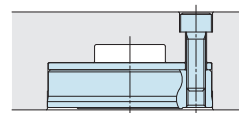
16 : VSJ160-□

2 Design No.

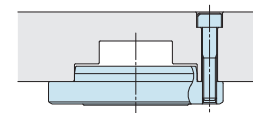
0 : Revision Number

Other Mounting Examples (Reference)

※ Please contact us for mounting methods as shown in the drawing below.



VSJ Block: Bolt Mounting from the Upper Side



VSJ Block: Bolt Mounting from the Upper Side

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

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High-Power Hydraulic Link Clamp

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High-Power Pneumatic Hole Clamp

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High-Power Pneumatic Swing Clamp

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High-Power Pneumatic Link Clamp

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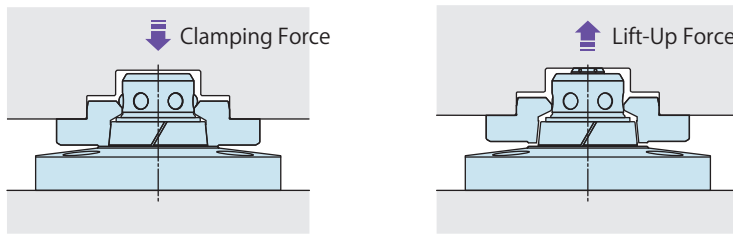
High-Power Pneumatic Work Support

WNC

High-Power Pneumatic Pallet Clamp

WVS

Clamping Force / Lift-Up Force

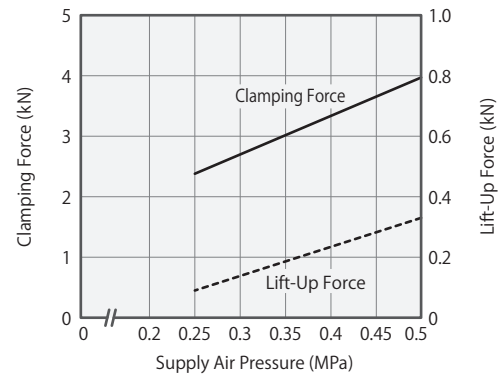


(Example)

When using WVS0060-M□
 Supply Air Pressure 0.4MPa
 Clamping force is about 5.3kN
 Lift-up force is about 0.34kN.

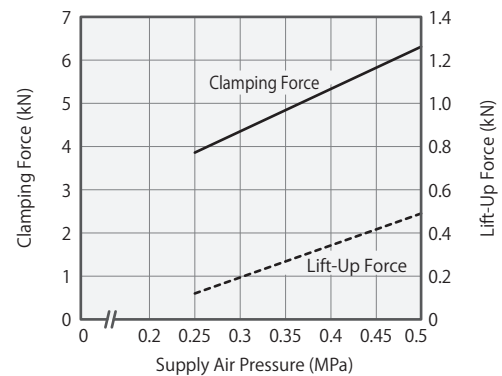
WVS0040-M□

Supply Air Pressure (MPa)	Clamping Force(kN)	Lift-Up Force (kN)
0.5	4.0	0.33
0.45	3.6	0.28
0.4	3.3	0.23
0.35	3.0	0.19
0.3	2.7	0.14
0.25	2.4	0.09
Holding Force at 0 MPa ※1	0.8	-
Operating Pressure Range (MPa)	0.25 ~ 0.5	



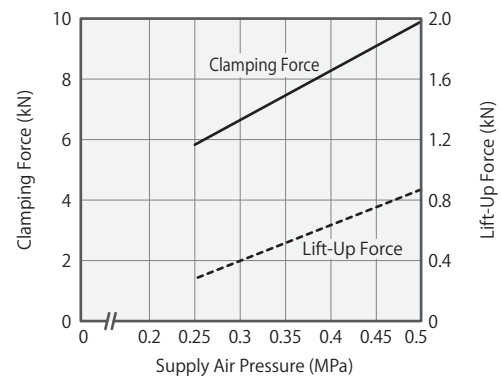
WVS0060-M□

Supply Air Pressure (MPa)	Clamping Force(kN)	Lift-Up Force (kN)
0.5	6.3	0.49
0.45	5.8	0.42
0.4	5.3	0.34
0.35	4.8	0.27
0.3	4.4	0.20
0.25	3.9	0.12
Holding Force at 0 MPa ※1	1.4	-
Operating Pressure Range (MPa)	0.25 ~ 0.5	



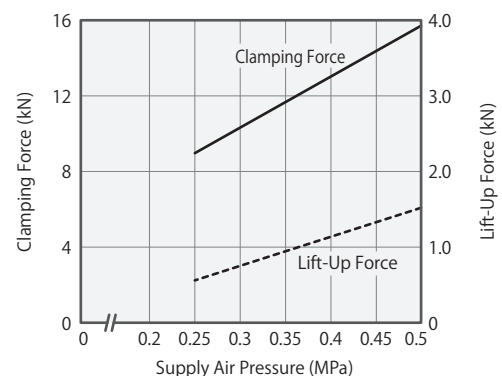
WVS0100-M□

Supply Air Pressure (MPa)	Clamping Force(kN)	Lift-Up Force (kN)
0.5	9.9	0.87
0.45	9.1	0.75
0.4	8.3	0.64
0.35	7.5	0.52
0.3	6.6	0.40
0.25	5.8	0.28
Holding Force at 0 MPa ※1	1.8	-
Operating Pressure Range (MPa)	0.25 ~ 0.5	



WVS0160-M□

Supply Air Pressure (MPa)	Clamping force(kN)	Lift-up force (kN)
0.5	15.7	1.52
0.45	14.4	1.33
0.4	13.0	1.14
0.35	11.7	0.94
0.3	10.3	0.75
0.25	9.0	0.56
Holding Force at 0 MPa ※1	2.2	-
Operating Pressure Range (MPa)	0.25 ~ 0.5	



Notes

1. This graph shows the value for single clamp.
 2. This graph shows the relationship between Supply Air Pressure and Clamping Force (solid line) / Lift-Up Force (dotted line).
- ※1. It shows holding force at 0MPa air pressure and does not satisfy specifications.

 MEMO

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

High-Power Pneumatic Work Support

WNC

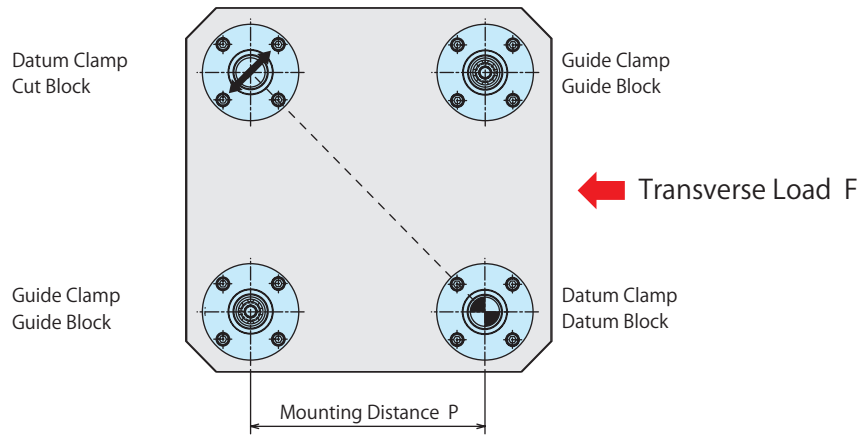
High-Power Pneumatic Pallet Clamp

WVS

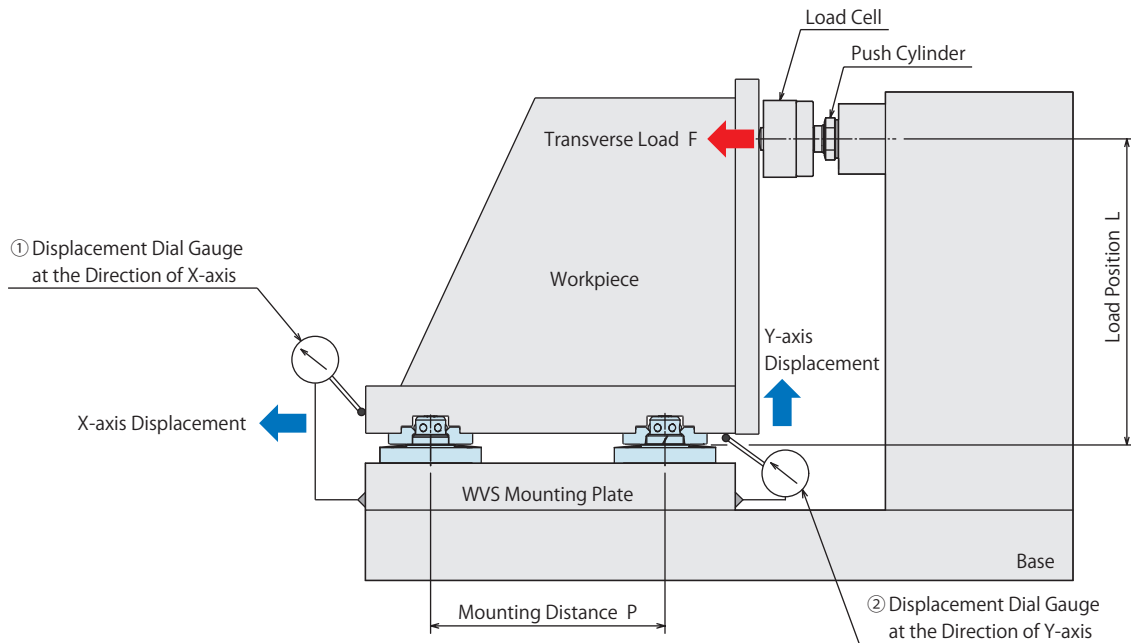
Displacement against Transverse Load

※ The displacement is the predicted reference value based on the test data under the conditions shown below.
 Displacement may vary according to conditions of fixtures. The displayed values are reference based on the test data.

Clamp/Block Layout



Test Device



How to Read Displacement

(Ex.) When using WVS0040

Components

- 【Clamp】
- WVS0040-MD×2 Units
- WVS0040-MG×2 Units
- 【Block】
- VSJ020-D×1 Unit
- VSJ020-C×1 Unit
- VSJ020-G×2 Units

Conditions

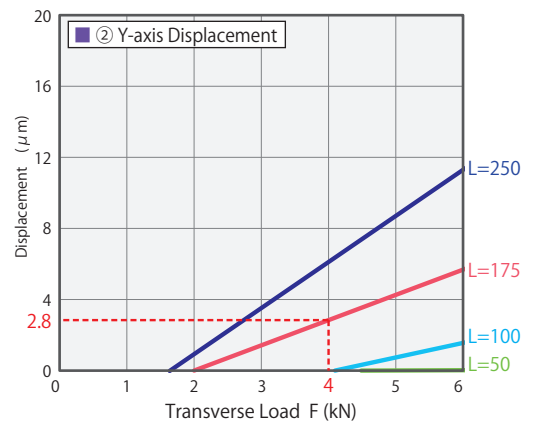
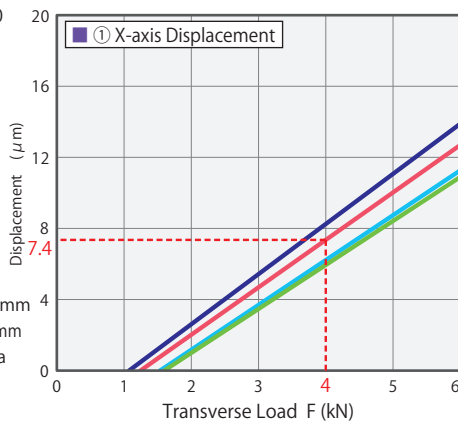
- Mounting Distance P=200mm
- Load Position L=175mm
- Supply Air Pressure 0.5MPa
- Transverse Load F=4kN

Displacement

- ① X-axis displacement is about 7.4 μm.
- ② Y-axis displacement is about 2.8 μm.

Note

1. Please contact us in case the conditions are different.

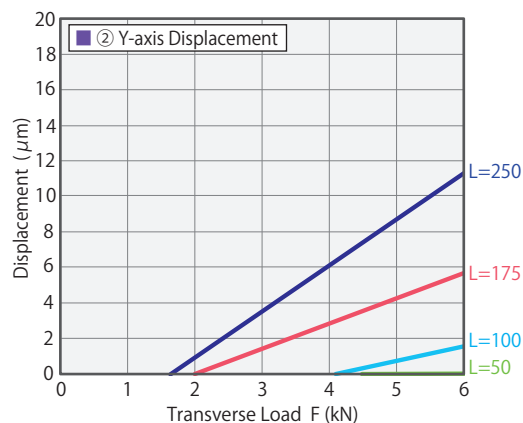
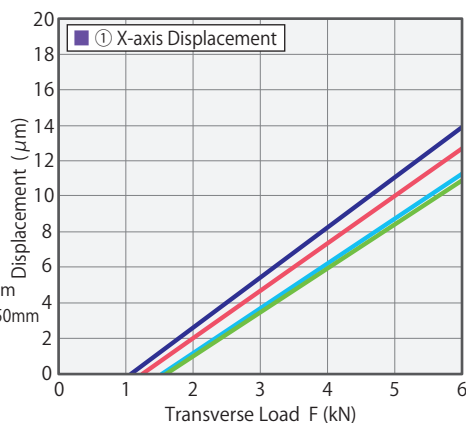


High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

High-Power Hydraulic Swing Clamp
LHE
High-Power Hydraulic Link Clamp
LKE
High-Power Pneumatic Hole Clamp
SWE
High-Power Pneumatic Swing Clamp
WHE
High-Power Pneumatic Link Clamp
WCE
High-Power Pneumatic Work Support
WNC
High-Power Pneumatic Pallet Clamp
WVS

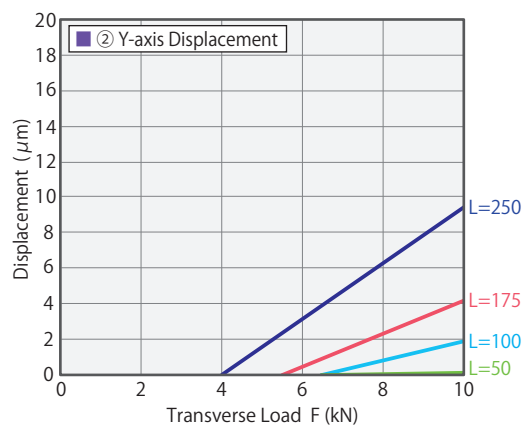
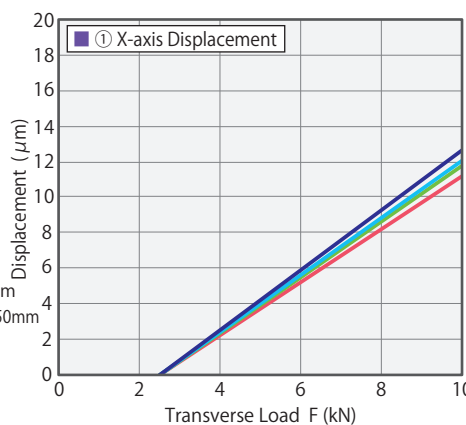
WVS0040

- Components**
 【Clamp】
 WVS0040-MD×2 Units
 WVS0040-MG×2 Units
 【Block】
 VSJ020-D×1 Unit
 VSJ020-C×1 Unit
 VSJ020-G×2 Units
- Conditions**
 Mounting Distance P=200mm
 Load Position L=50~250mm
 Supply Air Pressure 0.5MPa
- Clamping Force**
 Total 16kN (4.0kN×4)



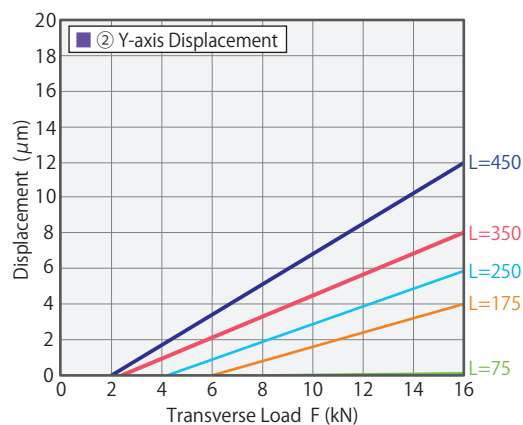
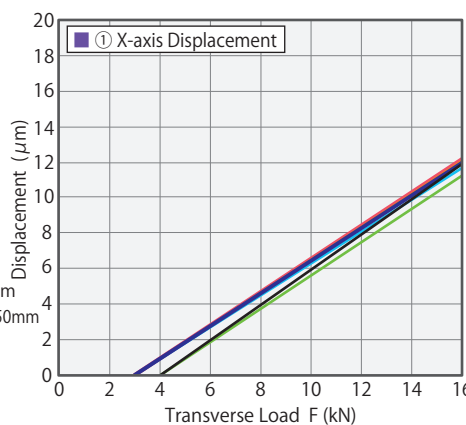
WVS0060

- Components**
 【Clamp】
 WVS0060-MD×2 Units
 WVS0060-MG×2 Units
 【Block】
 VSJ060-D×1 Unit
 VSJ060-C×1 Unit
 VSJ060-G×2 Units
- Conditions**
 Mounting Distance P=200mm
 Load Position L=50~250mm
 Supply Air Pressure 0.5MPa
- Clamping Force**
 Total 25.2kN (6.3kN×4)



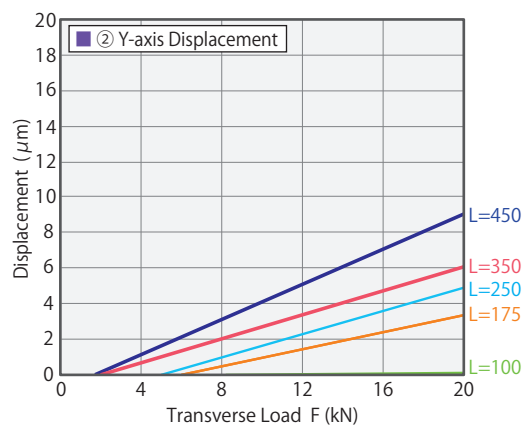
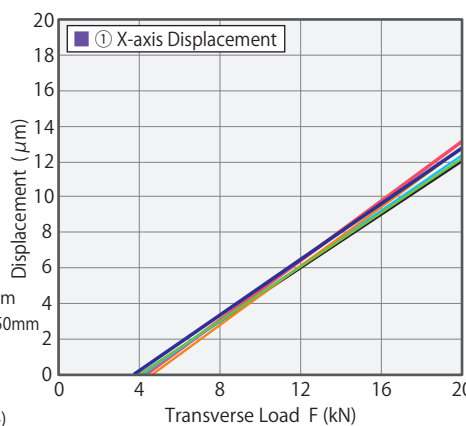
WVS0100

- Components**
 【Clamp】
 WVS0100-MD×2 Units
 WVS0100-MG×2 Units
 【Block】
 VSJ100-D×1 Unit
 VSJ100-C×1 Unit
 VSJ100-G×2 Units
- Conditions**
 Mounting Distance P=300mm
 Load Position L=50~450mm
 Supply Air Pressure 0.5MPa
- Clamping Force**
 Total 39.6kN (9.9kN×4)



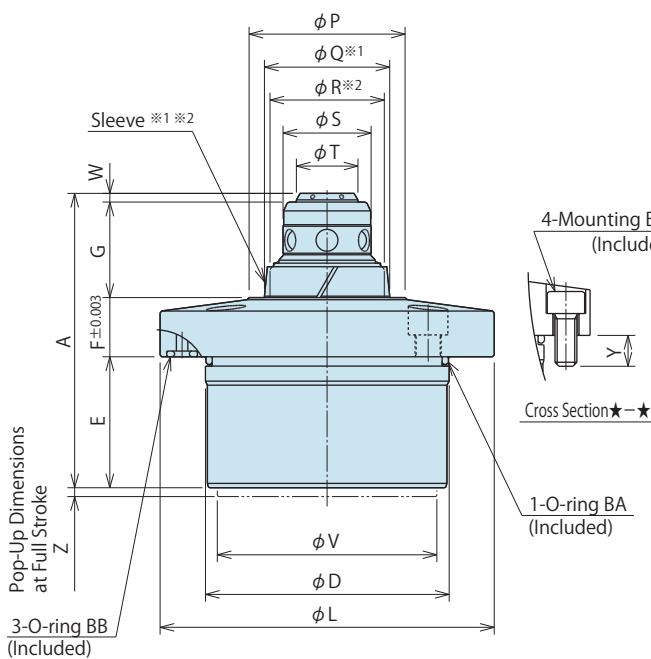
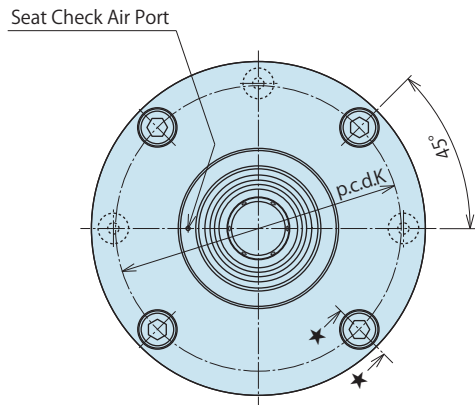
WVS0160

- Components**
 【Clamp】
 WVS0160-MD×2 Units
 WVS0160-MG×2 Units
 【Block】
 VSJ160-D×1 Unit
 VSJ160-C×1 Unit
 VSJ160-G×2 Units
- Conditions**
 Mounting Distance P=300mm
 Load Position L=50~450mm
 Supply Air Pressure 0.5MPa
- Clamping Force**
 Total 62.8kN (15.7kN×4)

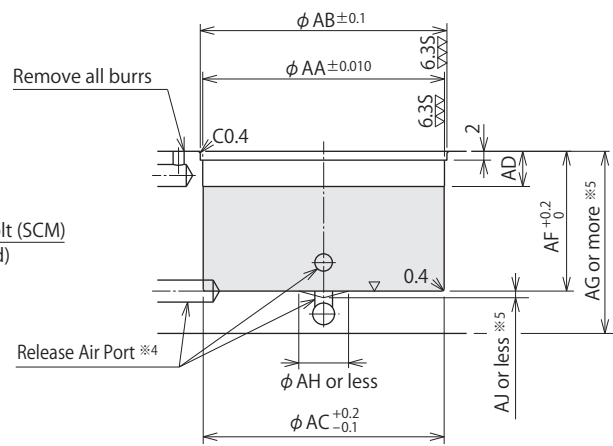
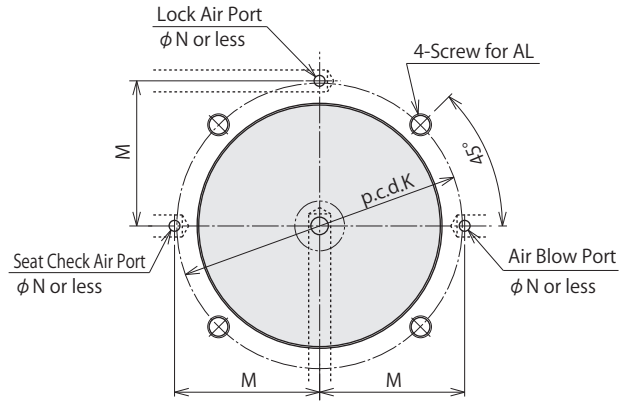


External Dimensions

※ This drawing shows the release state of WVS.

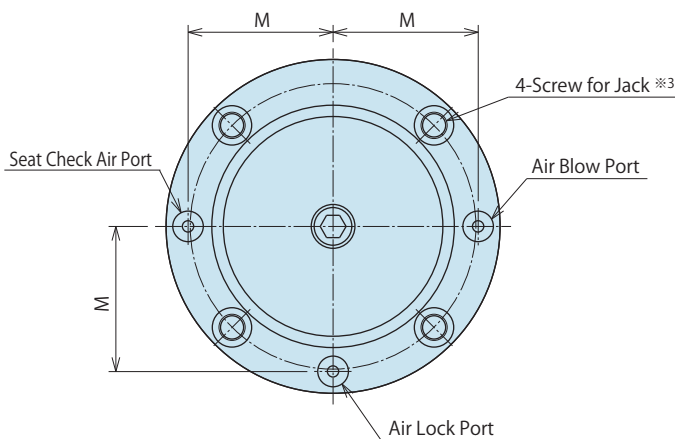


Machining Dimensions of Mounting Area

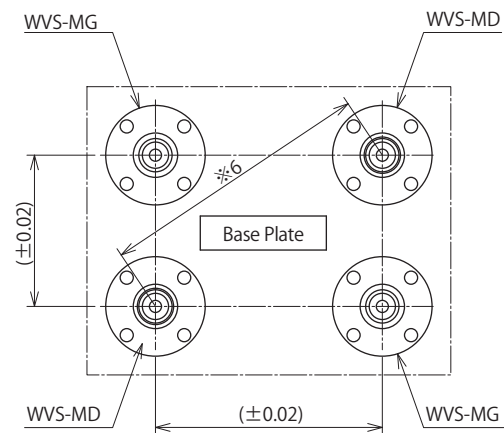


Notes

1. Make sure no burrs are on or around the hole intersection.
- ※ 4. The release hydraulic port is within range.
- ※ 5. The base thickness (AG) and remaining depth after boring (AJ) are reference values when the base material is S50C.



Distance Accuracy of Each Clamp



Notes

- ※ 1. ϕQ shows the dimensions of sleeve (taper) of datum clamp (WVS-MD).
- ※ 2. ϕR shows the dimensions of sleeve (straight) of guide clamp (WVS-MG).
- ※ 3. The screw for jack is used when removing the clamp. (See P.168 for usage.)

Note

- ※ 6. Please make sure the distance accuracy of each datum clamp is below ± 0.025 mm between the clamps with the longest distance.

Specifications

Model		WVS0040-M□	WVS0060-M□	WVS0100-M□	WVS0160-M□
Locating Repeatability	mm	0.003			
Full Stroke	mm	3.4	3.4	4.0	4.5
Lift Up Stroke	mm	1.0			
Offset Tolerance when fixture pallet is set	mm	1.0	1.5	1.5	1.5
Max. Loading Weight ※8	kg	300	600	1000	1500
Cylinder Capacity ※7	Lock	8.76	13.56	26.10	51.52
	cm ³ Release	9.41	14.75	28.01	54.51
Holding Force at 0 MPa ※7 ※9	kN	0.8	1.4	1.8	2.2
Max. Operating Pressure	MPa	0.5			
Min. Operating Pressure	MPa	0.25			
Withstanding Pressure	MPa	0.75			
Air Blow Pressure	MPa	0.4~0.5			
Operating Temperature	°C	0~70			
Usable Fluid		Dry Air			
Mass※7	kg	0.7	1.0	1.8	3.5

Notes

※ 7. The specifications show one unit.

※ 8. When the pallet is in horizontal position (leveled), make sure the weight of the workpiece & fixture is less than the lift force of the clamps and maximum load of the machine. The release pneumatic pressure is decided with the loaded mass (fixture) considered.

(Please set the loaded mass below 80% of the lift force (number of clamps X lift force).)

Please let us know if you are going to use it in vertical position

※ 9. It shows holding force at 0MPa air pressure and does not satisfy specifications.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model		WVS0040-M□	WVS0060-M□	WVS0100-M□	WVS0160-M□
A		65.7	67.2	78.2	90.2
D	WVS-MD	45 ^{+0.030} _{+0.011}	55 ^{+0.030} _{+0.011}	69 ^{+0.030} _{+0.011}	87.5 ^{+0.030} _{+0.011}
	WVS-MG	45 ⁰ _{-0.020}	55 ⁰ _{-0.020}	69 ⁰ _{-0.020}	87.5 ⁰ _{-0.020}
E		30	30	34	39
F		12	13.5	16	20
G		21.7	21.7	26.5	29.5
K		55	65	81	102.5
L		66	76	94	118.5
M		28	33	41	51.5
N		2.5	2.5	3	5
P		32	35.5	44	51
Q		25	28.5	36	42
R		22.5	26	32.3	38.3
S		18	20	26	32
T		12	14	18.8	22.4
V		40	50	63	80
W		2	2	1.7	1.7
Y		8	7	8	11.8
Z		0.5	0.5	1	1
AA		45	55	69	87.5
AB		45.2	55.2	69.2	87.7
AC		44.8	54.8	68.8	87.3
AD		8	8	9	10
AF		30.5	30.5	35	40
AG		35	35	40	45
AH		9	9	14	17
AJ		2.5	2.5	2.5	2.5
AL		M5×0.8 Thread Depth 10	M5×0.8 Thread Depth 10	M6×1 Thread Depth 10	M8×1 Thread Depth 14
1-O-ring BA		AS568-030(70°)	AS568-033(70°)	AS568-037(70°)	AS568-042(70°)
3-O-ring BB		AS568-007(70°)	AS568-007(70°)	1AP5	1AP7
Mounting Bolt		M5×0.8×12	M5×0.8×12	M6×1×14	M8×1.25×20
Screw for Jack		M6×1	M6×1	M8×1.25	M10×1.5

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

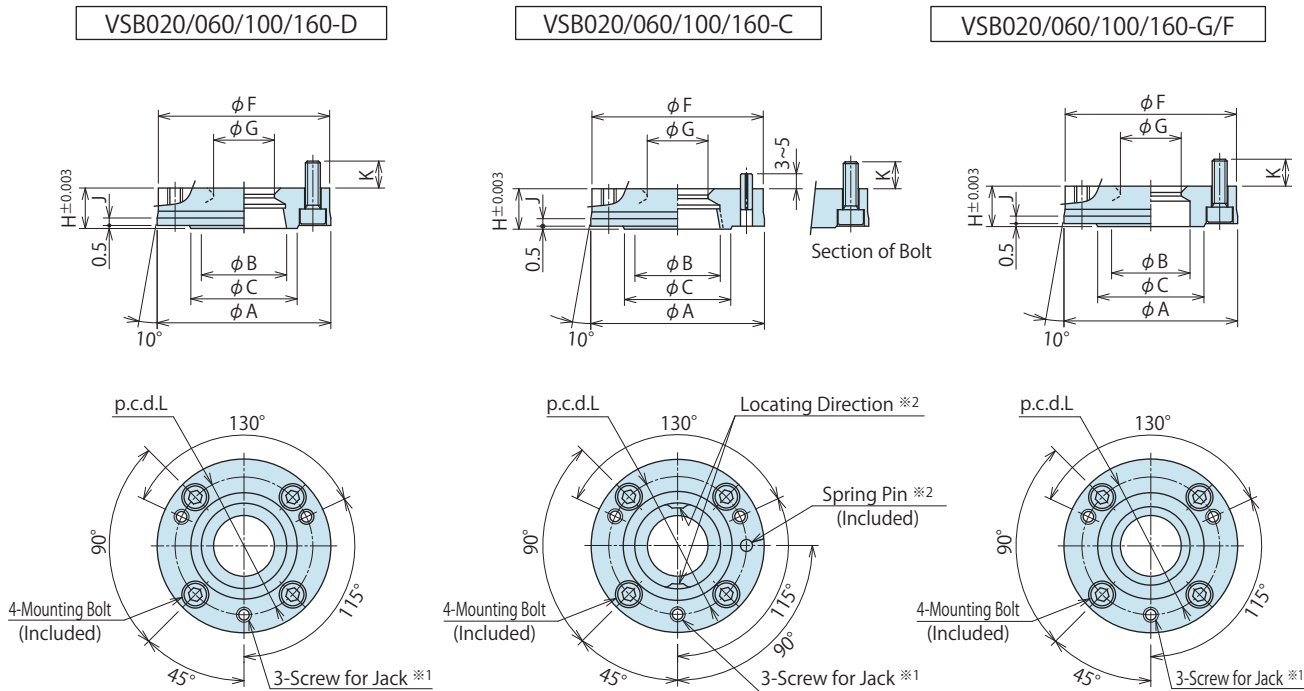
High-Power Pneumatic Work Support

WNC

High-Power Pneumatic Pallet Clamp

WVS

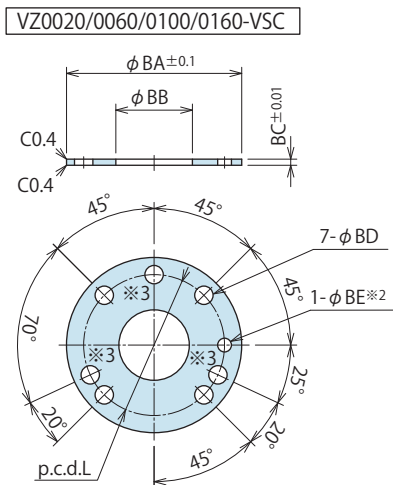
External Dimensions



Notes

- ※1. The screw for jack is used when removing VSB block.
- ※2. The spring pin is used for phasing of VSB-C locating direction.

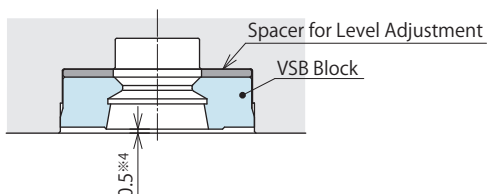
Dimensions of Collar for Level Adjustment



Notes

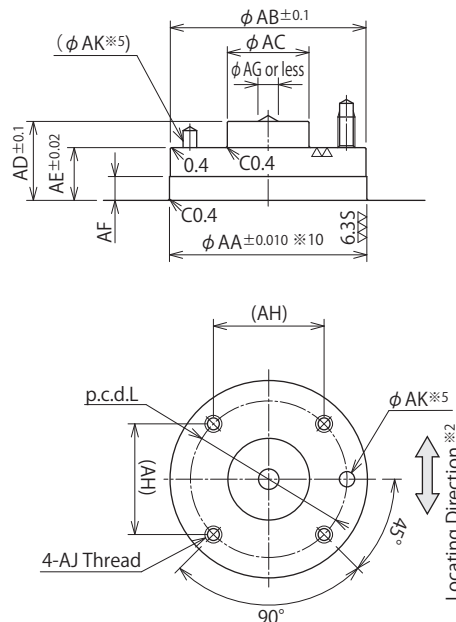
- 1. Please refer to the drawing above in case the collar for level adjustment is prepared by yourself.
- ※3. The screw for jack is used when VSB block is removed.

※Mounting of Collar for Level Adjustment.



※4. Clearance between the seating area of VSB block and block bottom.

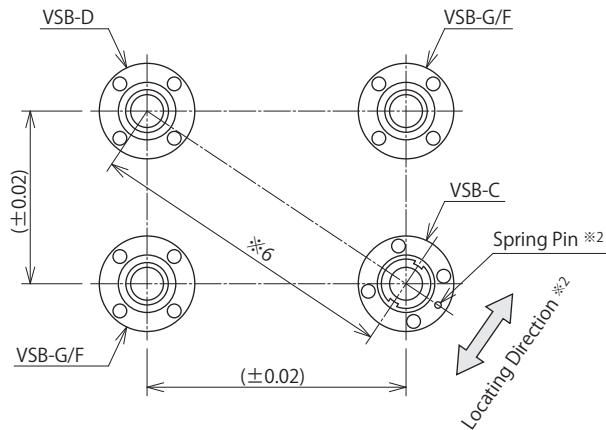
Machining Dimensions of Mounting Area



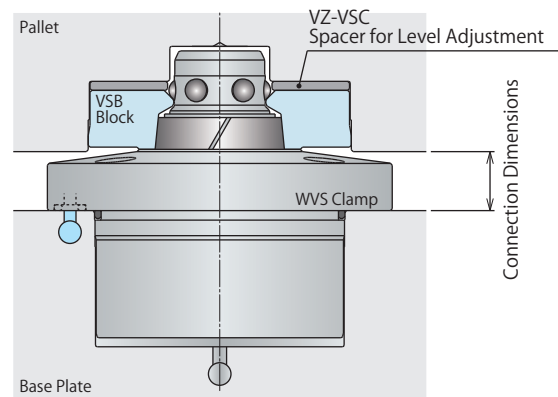
Notes

- 1. This graph shows the case where the clearance between the seating area of VSB block and pallet bottom is 0.5mm when the collar for level adjustment is used.
- ※5. phi AK hole is used for phasing of VSB-C positioning direction. Please make sure is phi AK hole is at the line connecting the centers of VSB-D and VSB-C. This processing is only necessary for VSB-C.

Mounting Distance Accuracy and VSB-C Phase



Connection Dimensions



Note

※6. Please make sure the precision between block pitches is within ± 0.025 mm between the blocks with the longest distance.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	VSB020-D VSB020-C	VSB020-G VSB020-F	VSB060-D VSB060-C	VSB060-G VSB060-F	VSB100-D VSB100-C	VSB100-G VSB100-F	VSB160-D VSB160-C	VSB160-G VSB160-F
A	50 ^{+0.027} / _{+0.011}	50g7 ^{-0.009} / _{-0.034}	58m6 ^{+0.030} / _{+0.011}	58g7 ^{-0.010} / _{-0.040}	70m6 ^{+0.030} / _{+0.011}	70g7 ^{-0.010} / _{-0.040}	83m6 ^{+0.035} / _{+0.013}	83g7 ^{-0.012} / _{-0.047}
B	25	22.7 (25.5) ^{※7}	28.5	26.2 (29) ^{※7}	36	32.5 (36.5) ^{※7}	42	38.5 (42.5) ^{※7}
C		32		35.5		44		51
F		49.2		57.2		69.2		82.2
G		18.3		20.3		26.3		32.3
H		13		13		16.5		17.5
J		2.5		2.5		2.5		3
K		8		9		10.5		16.5
L		40		46		56		66
AA ^{※10}		50		58		70		83
AB		49.5		57.5		69.5		82.5
AC		22		24		30		36
AD		23.2		23.2		27.7		30.7
AE		15.5		15.5		20		21
AF		7		7		8		8
AG		3		3		5		5
(AH)		28.28		32.53		39.6		46.67
AJ	M4×0.7 Thread Depth 7		M5×0.8 Thread Depth 8		M6×1 Thread Depth 10		M8×1.25 Thread Depth 14.5	
AK	φ3.4 Depth 5		φ4.5 Depth 5		φ4.5 Depth 5		φ4.5 Depth 5	
Mounting Bolt	M4×0.7×16		M5×0.8×16		M6×1×20		M8×1.25×25	
Screw for Jack	M4×0.7		M5×0.8		M6×1		M8×1.25	
Spring Pin ^{※8}	φ3×10		φ4×10		φ4×10		φ4×10	
Mass	0.15kg		0.2kg		0.35kg		0.5kg	
Appropriate Clamp	WVS0040-MD	WVS0040-MG ^{※9}	WVS0060-MD	WVS0060-MG ^{※9}	WVS0100-MD	WVS0100-MG ^{※9}	WVS0160-MD	WVS0160-MG ^{※9}
	VS0020-MD	VS0020-MG						
	VS/VT0040-MD	VS/VT0040-MG ^{※9}	VS/VT0060-MD	VS/VT0060-MG ^{※9}	VS/VT0100-MD	VS/VT0100-MG ^{※9}	VS/VT0160-MD	VS/VT0160-MG ^{※9}
Connection Dimensions	When lock	11.5	13	15.5	19.5			
WVS/VS	When release	12.5	14	16.5	20.5			

Model	VZ0020-VSC	VZ0060-VSC	VZ0100-VSC	VZ0160-VSC
BA	49.2	57.2	69.2	82.2
BB	23	25	32	38
BC	2	2	3	3
BD	5	6	7.5	10
BE	3.4	4.5	4.5	4.5

Notes

- ※ 7. The dimensions in () display that of VSB-F.
- ※ 8. The spring pin is used only on VSB-C.
- ※ 9. The guide block (VSB-G) is used only for guide clamp (WVS-G) and the free block (VSB-F) can be used for both datum clamp (WVS-D) and guide clamp (WVS-G).
- ※ 10. Pallet with low rigidity (thin pallet or pallet made of aluminum etc.) may be deformed when mounting VSB block.
In this case, tolerance of mounting hole machining dimension $AA \pm 0.010$ should be close to $+0.010$ (the upper limit of the tolerance).

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

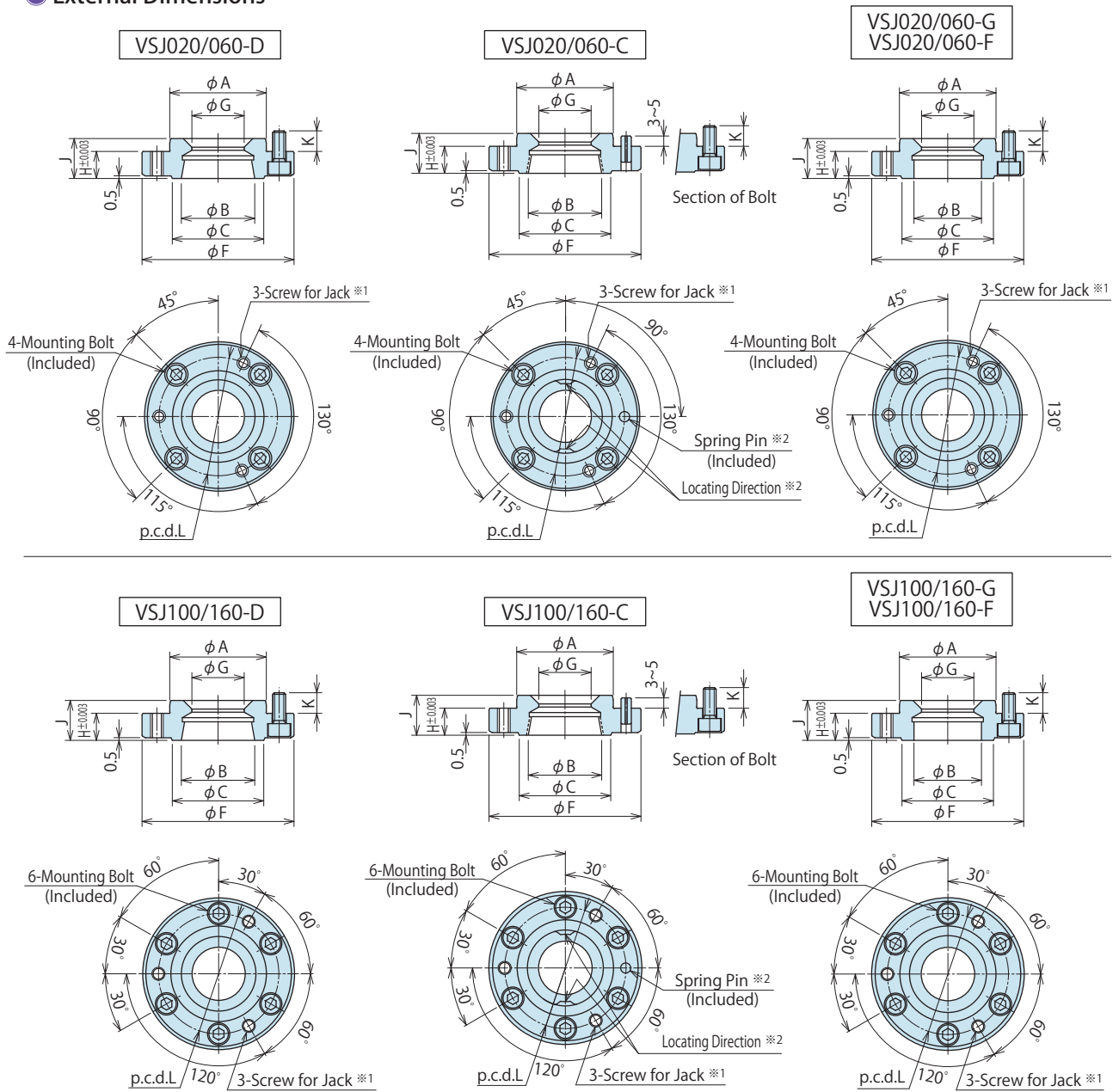
High-Power Pneumatic Work Support

WNC

High-Power Pneumatic Pallet Clamp

WVS

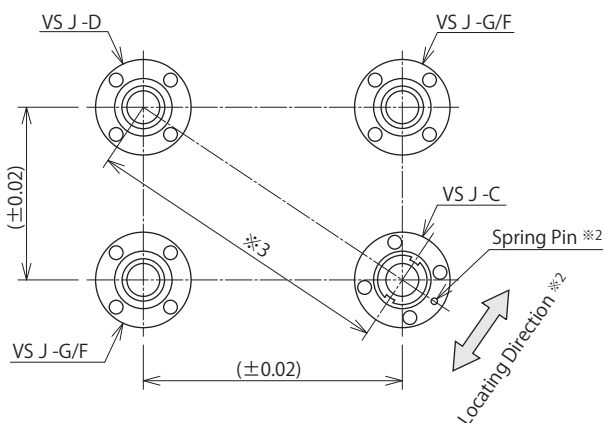
External Dimensions



Notes

- ※1. The screw for jack is used when VSJ block is removed.
- ※2. The spring pin is used for phasing of VSJ-C locating direction.

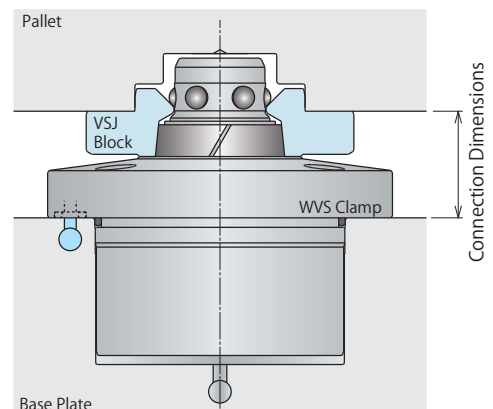
Mounting Distance Accuracy and VSJ-C Phase



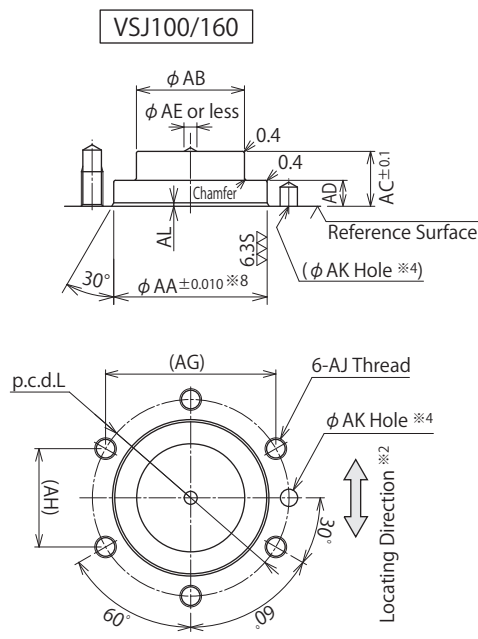
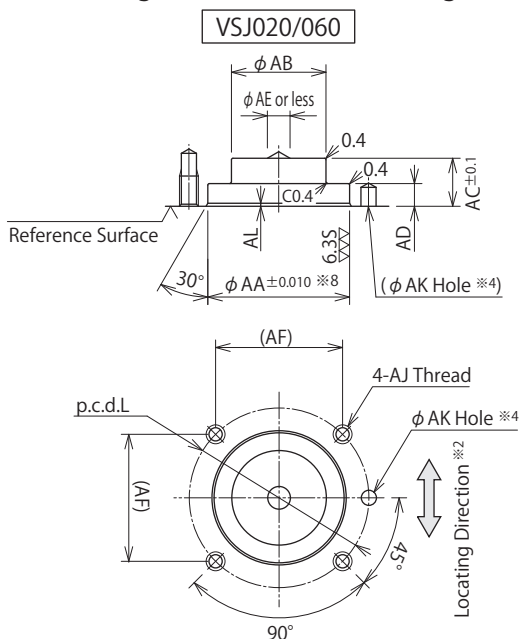
Note

- ※3. Please make sure the precision between block pitches is within $\pm 0.025\text{mm}$ between the blocks with the longest distance.

Connection Dimensions



Machining Dimensions of Mounting Area



Note

※ 4. ϕ AK hole is used for phasing of VSJ-C locating direction.

Please make sure ϕ AK hole is at the line connecting the centers of VSB-D and VSB-C. This processing is only necessary for VSB-C.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	VSJ020-D VSJ020-C	VSJ020-G VSJ020-F	VSJ060-D VSJ060-C	VSJ060-G VSJ060-F	VSJ100-D VSJ100-C	VSJ100-G VSJ100-F	VSJ160-D VSJ160-C	VSJ160-G VSJ160-F
A	31.5 ^{+0.027} / _{+0.011}	31.5g7 ^{-0.009} / _{-0.034}	37.5 ^{+0.027} / _{+0.011}	37.5g7 ^{-0.009} / _{-0.034}	52m6 ^{+0.030} / _{+0.011}	52g7 ^{-0.010} / _{-0.040}	62m6 ^{+0.030} / _{+0.011}	62g7 ^{-0.010} / _{-0.040}
B	25	22.7 (25.5) ^{※5}	28.5	26.2 (29) ^{※5}	36	32.5 (36.5) ^{※5}	42	38.5 (42.5) ^{※5}
C	32		35.5		44		51	
F	49		59		74		89	
G	18.3		20.3		26.3		32.3	
H	8		10		10		12	
J	13		15		16.5		18.5	
K	6.7		7.8		7.8		8.8	
L	40		47.5		62.5		75	
AA ^{※8}	31.5		37.5		52		62	
AB	22		25		31		38	
AC	14.7		12.7		17.2		18.2	
AD	6		6		7.5		7.5	
AE	3		3		5		5	
(AF)	28.28		33.59		-		-	
(AG)	-		-		54.13		64.95	
(AH)	-		-		31.25		37.5	
AJ	M4×0.7 Thread Depth 8		M5×0.8 Thread Depth 9		M5×0.8 Thread Depth 9		M6×1 Thread Depth 10	
AK	ϕ 3.4 Depth 5		ϕ 4.5 Depth 5		ϕ 4.5 Depth 5		ϕ 4.5 Depth 5	
AL	0.8		0.8		0.8		0.8	
Chamfer	-		-		C0.4		C0.4	
Mounting Bolt	M4×0.7×10		M5×0.8×12		M5×0.8×12		M6×1×14	
Screw for Jack	M4×0.7		M5×0.8		M5×0.8		M6×1	
Spring Pin ^{※6}	ϕ 3×10		ϕ 4×10		ϕ 4×10		ϕ 4×10	
Mass	0.1kg		0.18kg		0.3kg		0.55kg	
Appropriate Clamp	WVS0040-MD	WVS0040-MG ^{※7}	WVS0060-MD	WVS0060-MG ^{※7}	WVS0100-MD	WVS0100-MG ^{※7}	WVS0160-MD	WVS0160-MG ^{※7}
	VS0020-MD VS/VT0040-MD	VS0020-MG VS/VT0040-MG ^{※7}	VS/VT0060-MD	VS/VT0060-MG ^{※7}	VS/VT0100-MD	VS/VT0100-MG ^{※7}	VS/VT0160-MD	VS/VT0160-MG ^{※7}
Connection Dimensions WVS/VS	When lock	20	23.5	26	32			
	When release	21	24.5	27	33			

Notes

※ 5. The dimensions in () display that of VSJ-F.

※ 6. The spring pin is used only on VSJ-C.

※ 7. The guide block (WVS-G) and the free block (VSJ-F) can be used for both datum clamp (WVS-D) and guide clamp (WVS-G).

※ 8. Pallet with low rigidity (thin pallet or pallet made of aluminum etc.) may be deformed when mounting VSB block.

In this case, tolerance of mounting hole machining dimension $AA \pm 0.010$ should be close to +0.010 (the upper limit of the tolerance).

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

High-Power Hydraulic
Swing Clamp

LHE

High-Power Hydraulic
Link Clamp

LKE

High-Power Pneumatic
Hole Clamp

SWE

High-Power Pneumatic
Swing Clamp

WHE

High-Power Pneumatic
Link Clamp

WCE

High-Power Pneumatic
Work Support

WNC

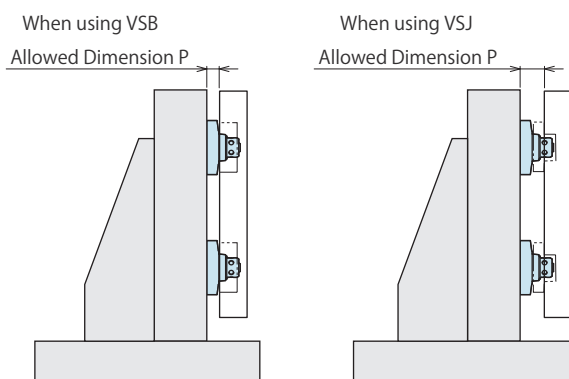
High-Power Pneumatic
Pallet Clamp

WVS

Cautions

Notes for Design

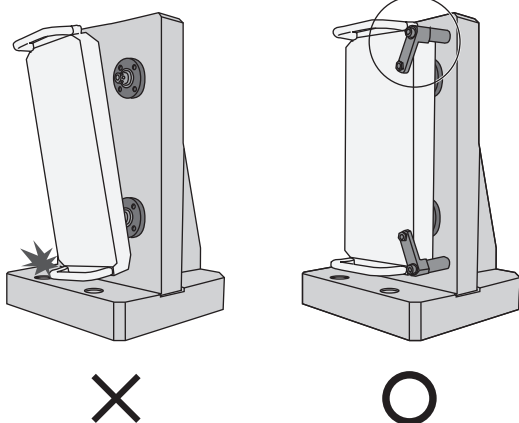
- 1) Check Specifications
 - Please use each product according to the specifications.
- 2) Notes for Circuit Design
 - Never supply pressure simultaneously to lock and release ports. If incorrectly designed, the machine may malfunction, sustain damage or have reduced performance.
 - It is recommended to use the air flow path over $\phi 6\text{mm}$.
- 3) When the pallet is in vertical position.
 - When the workpiece fixture plate is being set, make sure it is in proper proximity and square to the clamps. If it is locked out of position, the machine or clamps may be damaged.



Allowed Dimension P		(mm)			
Model No.	WVS0040	WVS0060	WVS0100	WVS0160	
VSB Block	13	14.5	17	21	
VSJ Block	21.5	25	27.5	33.5	

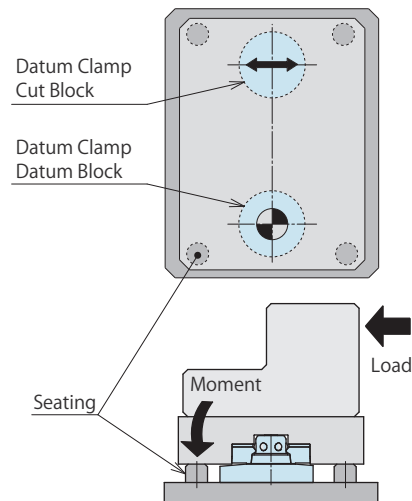
- As the workpiece fixture plate may fall down during releasing, it is recommended to set up the latching mechanism to prevent it from falling down.
- When the pallet is used in vertical position (hanging on the wall), the internal moving parts tend to wear out. Confirm the positioning precision in a regular manner. In case the allowed range is exceeded, change the machine.

Example of Latching Mechanism



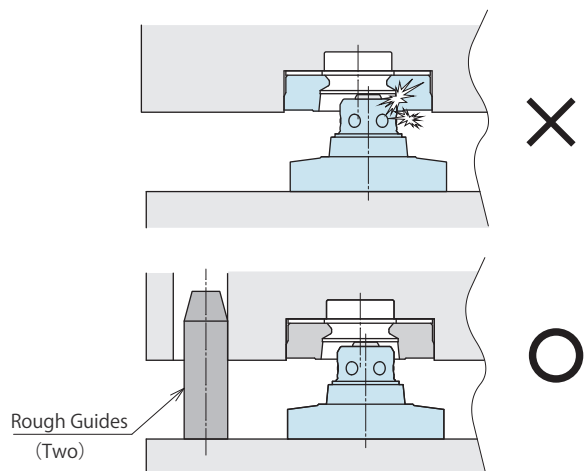
- When the pallet is in horizontal position (leveled), make sure the weight of the workpiece fixture is less than the lift force of the clamps and maximum load of the machine.
- When the pallet is in vertical position, make sure the weight of workpiece fixture pallet is 10% of the clamping force.
- Please contact us in case the pallet is in other positions.

- 4) Seat Setting
 - In case the clamp/block configuration is linear, it is recommended to provide additional supports for stability.

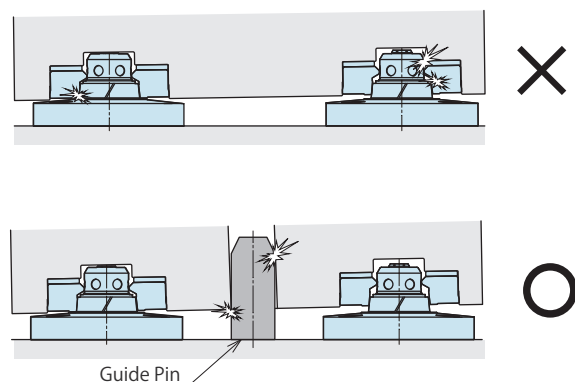


- 5) Setting of Rough Guide

- If the position of the pallet during loading is outside the clamp allowable tolerance, the clamp may prematurely contact the block taper surface causing damage affecting locating precision. It is recommended to use rough guides to contain the pallet within the allowable tolerance.



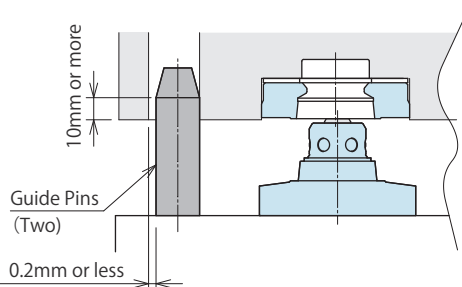
- The pallet must be level when lowering or lifting from the pallet clamps. If necessary, provide guide pins to keep the pallet level during loading and unloading.



- 6) It is necessary to have a guide in case the guide block (VSB/VSJ-G) is not used.
- The combination of guide clamp (WVS-G) and guide block (VSB/VSJ-G) ensures the protective function of datum clamp.
- The guide should be set up in case the guide block is not used in the applications below.

When only the combination of datum clamps (2) and datum block (VSB/VSJ-D) cut block (VSB/VSJ-C) is used.

When only the combination of datum clamp and free block (VSB/VSJ-F) is used to rotate the fixture plate.



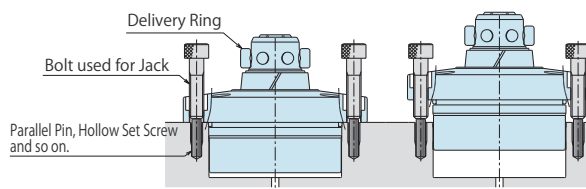
● Installation Notes

- 1) Check the fluid to use.
 - Please supply filtered clean dry air.
 - Oil supply with a lubricator etc. is unnecessary.
- 2) Procedure before Piping
 - The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
 - There is no filter provided with this product for prevention of contaminants in the air circuit.
- 3) Applying Sealing Tape
 - Wrap with tape 1 to 2 times following the screwing direction. Wrapping in the wrong direction will cause leaks and malfunction.
 - Pieces of the sealing tape can lead to air leaks and malfunction.
 - When piping, be careful that contaminant such as sealing tape does not enter in products.
- 4) Mounting the body
 - When mounting the product use all hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tighten them evenly to prevent twisting or jamming.

Clamp Model	Block Model		Thread Size	Tightening Torque (N·m)
	VSB	VSJ		
WVS	VSB	VSJ	M4×0.7	3.2
-	VSB020	VSJ020	M4×0.7	3.2
WVS0040	VSB060	VSJ060	M5×0.8	6.3
WVS0060	VSB100	VSJ100	M5×0.8	6.3
WVS0100	VSB100	VSJ160	M6×1	10
WVS0160	VSB160	-	M8×1.25	25

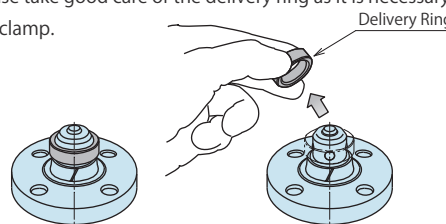
5) Removal

- Mount the delivery ring.
- Remove mounting bolts. Insert jack bolts and tighten evenly to lift clamp.
- Protect the screw parts with parallel pins as shown in the graph below in order for the bolts used for jack not to damage the surface of mounting screws.

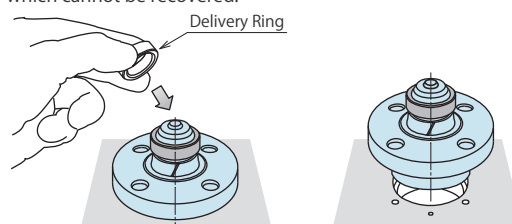


6) Delivery Ring (Important)

- The delivery ring is used to prevent separation of parts of individual clamps.
- The clamp will be equipped with a delivery ring for shipment. After the pallet clamp is mounted on the fixture, remove the delivery ring before use. (When the delivery ring is removed, ensure the release pneumatic pressure.)
- Please take good care of the delivery ring as it is necessary to remove the clamp.

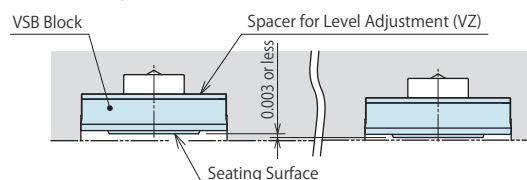


- When the pallet clamp is removed from the fixture, mount the delivery ring in advance. In case it is removed without using of the delivery ring, the internal parts may be separated from the spring, which cannot be recovered.



7) Level adjustment of block seating surface.

- When the fixture plates are assembled in the blocks, adjust the level of block seating surface in the way described below. (Recommended level adjustment: within $\pm 0.003\text{mm}$)
- ① Assemble the fixture plate in the sequence of collar used for level adjustment and block in the, and tighten them with specified torque.
- ② Measure the level of different block seating surfaces.
- ③ In case the levels are not even, remove the blocks, and grind the collars used for level adjustment so that the level range is within 0.003mm.
- ④ Once again, assemble the block and collar used for level adjustment into the fixture plate, and confirm the levels.



※ Please refer to P.1045 for common cautions.

• Notes on Handling

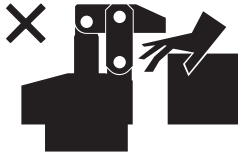
• Maintenance/Inspection

• Warranty

● Cautions

● Notes on Handling

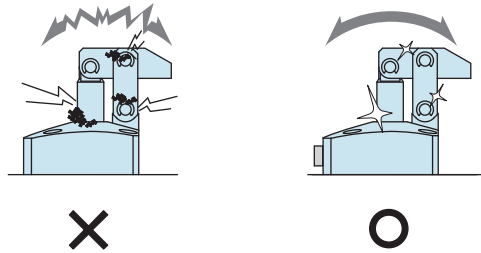
- 1) It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
 - ② Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - ③ After stopping the machine, do not remove until the temperature cools down.
 - ④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.
- 3) Do not touch clamps (cylinder) while clamps (cylinder) is working. Otherwise, your hands may be injured due to clinching.



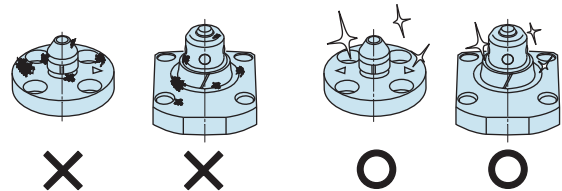
- 4) Do not disassemble or modify.
 - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● Maintenance and Inspection

- 1) Removal of the Machine and Shut-off of Pressure Source
 - Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - Make sure there is no abnormality in the bolts and respective parts before restarting.
- 2) Regularly clean the area around the piston rod and plunger.
 - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.



- 3) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VL/VM/VJ/VK/WVS/WM/WK/VX/VXF)
 - Location products, except VX/VXF model, can remove contaminants with cleaning functions. When installing pallets make sure there is no thick sludge like substances on pallets.
 - Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.



- 4) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
- 5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.
- 6) Make sure the hydraulic fluid has not deteriorated.
- 7) Make sure there is smooth action and no abnormal noise.
 - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 8) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 9) Please contact us for overhaul and repair.

Cautions

[Installation Notes
\(For Hydraulic Series\)](#)
[Hydraulic Fluid List](#)
[Notes on Hydraulic Cylinder
Speed Control Circuit](#)
[Notes on Handling](#)
[Maintenance/
Inspection](#)
[Warranty](#)

Company Profile

[Company Profile](#)
[Our Products](#)
[History](#)

Index

[Search by
Alphabetical Order](#)

Sales Offices

● Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.

Defects or failures caused by the following are not covered.

- ① If the stipulated maintenance and inspection are not carried out.
- ② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
- ③ If it is used or handled in inappropriate way by the operator.
(Including damage caused by the misconduct of the third party.)
- ④ If the defect is caused by reasons other than our responsibility.
- ⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
- ⑥ Other caused by natural disasters or calamities not attributable to our company.
- ⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

Sales Offices

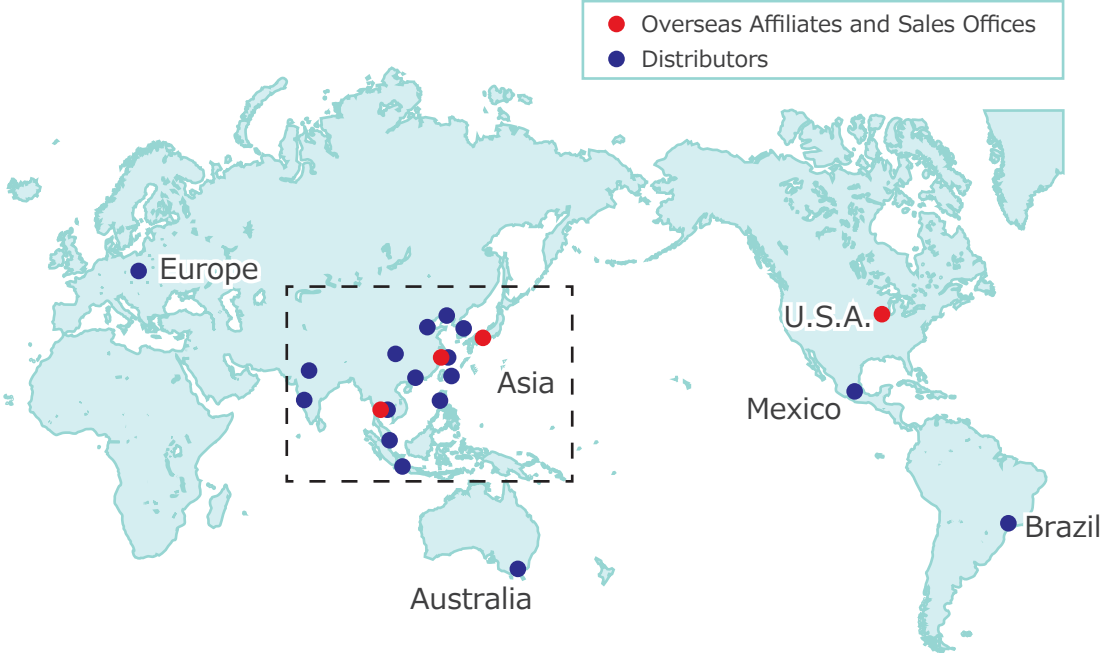
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KOSMEK (CHINA) LTD. 考世美(上海)貿易有限公司	21/F, Orient International Technology Building, No.58, Xiangchen Rd, Pudong Shanghai 200122., P.R.China 中国上海市浦东新区向城路58号东方国际科技大厦21F室 200122	
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Global Network



Asia Detailed Map



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