

Hydraulic Pallet Clamp

Model VS

Model VT

Model VSB

Model VSJ



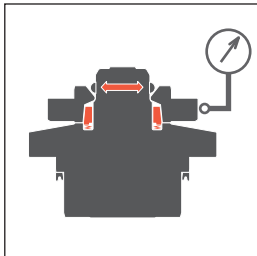
Instant clamping & positioning

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

PAT.

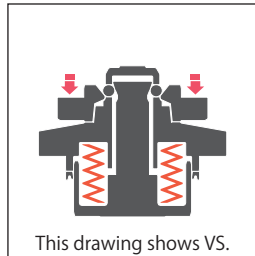
- Repetitive Locating with High Accuracy

Locating repeatability : $3 \mu\text{m}$
 Fixture alignment inspection is eliminated in the machining center.



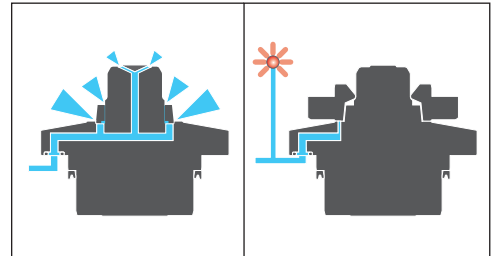
- Clamping Function

Clamping force is ranged from $2.5\text{kN} \sim 40\text{kN}$.
 It is possible to select clamping force depending on purpose.

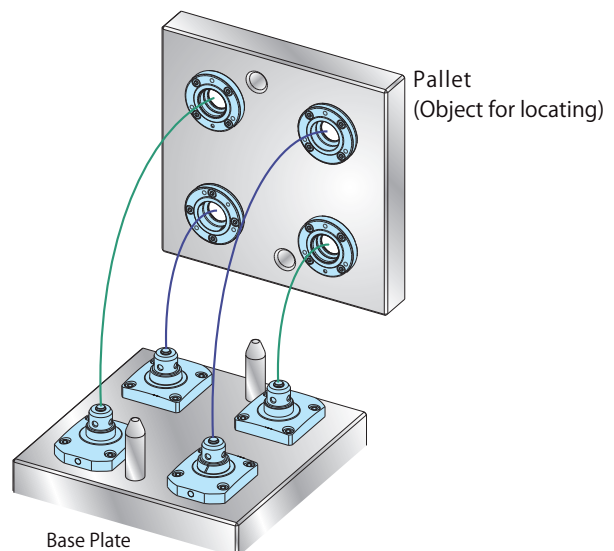
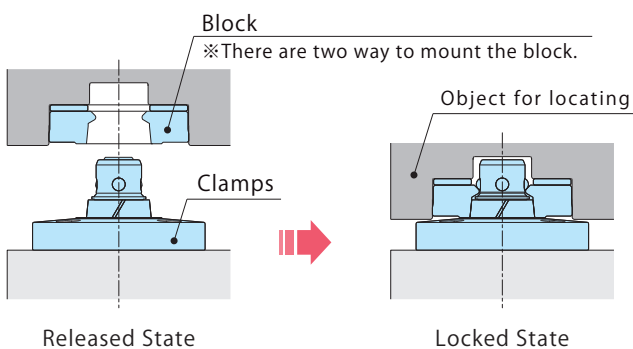


- Air-Blow and Seat Check

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



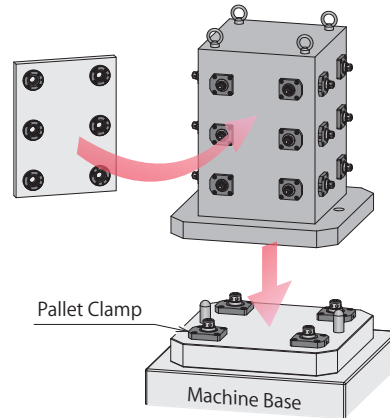
Action Description



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.



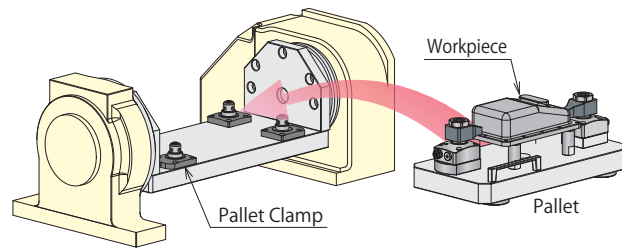
Pallet and Fixture Change Over on Machining Center

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.





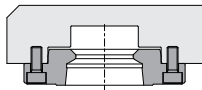
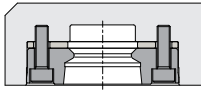


Manual Pallet Change

Pallet alignment is

Instant

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

	 Model VS → P.757	 Model VT → P.761	 Model VSJ → P.767	 Model VSB → P.765
Classification	Single Action Spring Lock / Hydraulic Release	Double Action	Flange Shaped Block	Embedded Block
Operating Pressure Range	3.5~7MPa	1.5~7MPa	—	—
Features	<ul style="list-style-type: none"> Detachment from the hydraulic source is possible with the spring lock system. Clamping force is stable because of the spring lock function. 	<ul style="list-style-type: none"> Stable Clamping force can be achieved by controlling hydraulic pressure. 	 Simple Mounting	 Straight Mounting
Accessories	Spacer for Level Adjustment (VS only) VZ-VS1 → P.759	—	—	The sequence of collar used for Level Adjustment (VSB only) VZ-VSC → P.765

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

● Installation Sample on the Machining Center

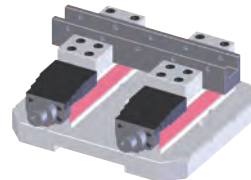
- With combination of machining center and pallet clamp, multiple fixtures and works become easily interchangeable.
- Internal setup time can be reduced with high precision repetitive positioning of pallet clamp + one touch clamping.
- If common layouts are used, fixture count and required machines can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



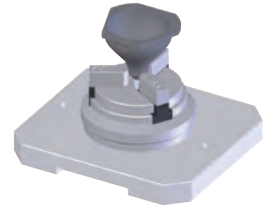
Angle Plate Fixture



Clamp Fixture



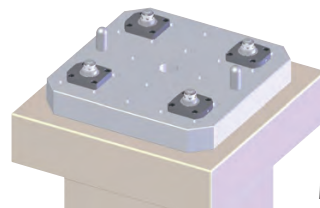
Vise Fixture



Chuck Fixture



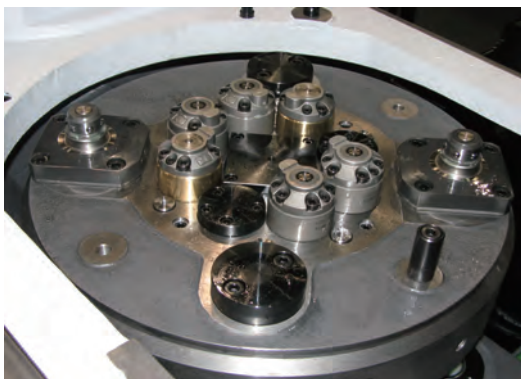
Base Plate



Machine Table

Shared

The pallet clamp is used at the machine table of the operating machine.



Preparation Side



Machine Side

- With non-leak auto-couplers there is no need for live hydraulic connection during machining.
- Using datum clamps in combination with non-leak auto couplers simplifies setup and reduces changeover time.

● Installation Sample on NC table

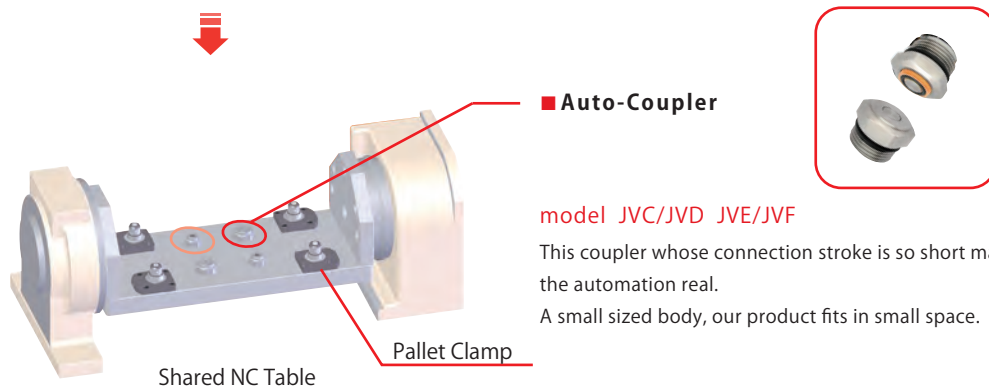
- With combination of NC table and pallet clamp, multiple fixtures and works become easily interchangeable.
- Hydraulic pressure, air pressure and coolant can be supplied to the fixture with the use of zero setting force type auto-couplers.



Hydraulic Clamp Fixture

Pneumatic Clamp Fixture

Air Chuck Fixture

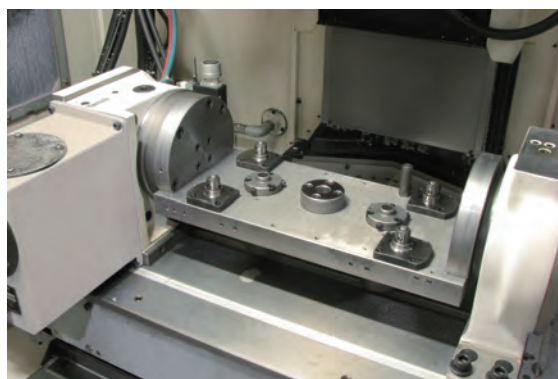


■ Auto-Coupler

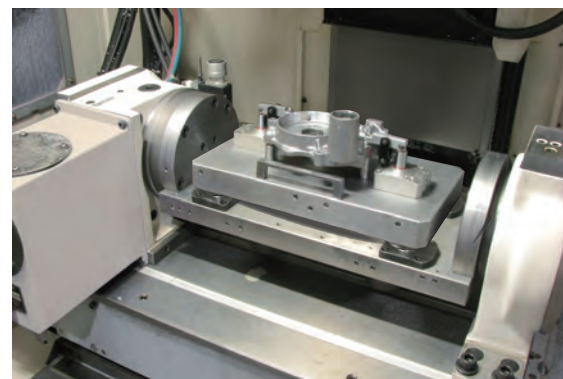
model JVC/JVD JVE/JVF

This coupler whose connection stroke is so short makes the automation real.

A small sized body, our product fits in small space.



Before Pallet Mounting



After Mounting Pneumatic Clamp

- The setup time during fixture changeover is greatly reduced.
- Thanks to high precision repetitive positioning (3 μm) of the pallet clamp, there is no need to check the fixture position precision within the machine.

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

Hole Clamp

- SFA
- SFC

Swing Clamp

- LHA
- LHC
- LHS
- LHW
- LT/LG
- TLA-2
- TLB-2
- TLA-1

Link Clamp

- LKA
- LKC
- LKW
- LM/LJ
- TMA-2
- TMA-1

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

- LL
- LLR
- LLU
- DP
- DR
- DS
- DT

Block Cylinder

- DBA
- DBC

Control Valve

- BZL
- BZT
- BZX/JZG

Pallet Clamp

- VS**
- VT**

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

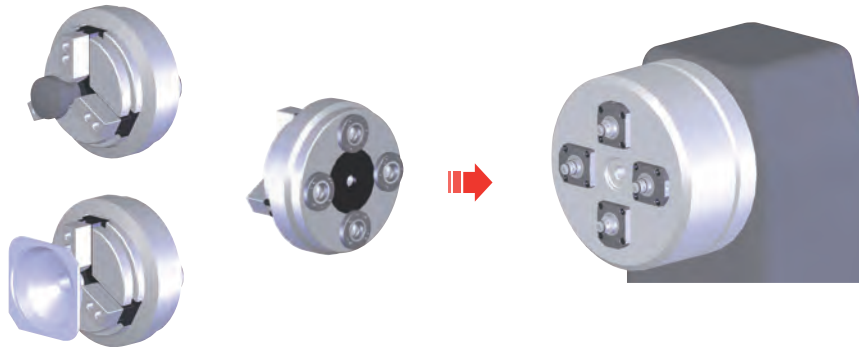
- FP
- FQ

Customized Spring Cylinder

- DWA/DWB

● Installation Sample to the Chuck used for Lathe

- With combination of the lathe unit and chuck, the workpiece setting time and chuck replacement time is substantially!



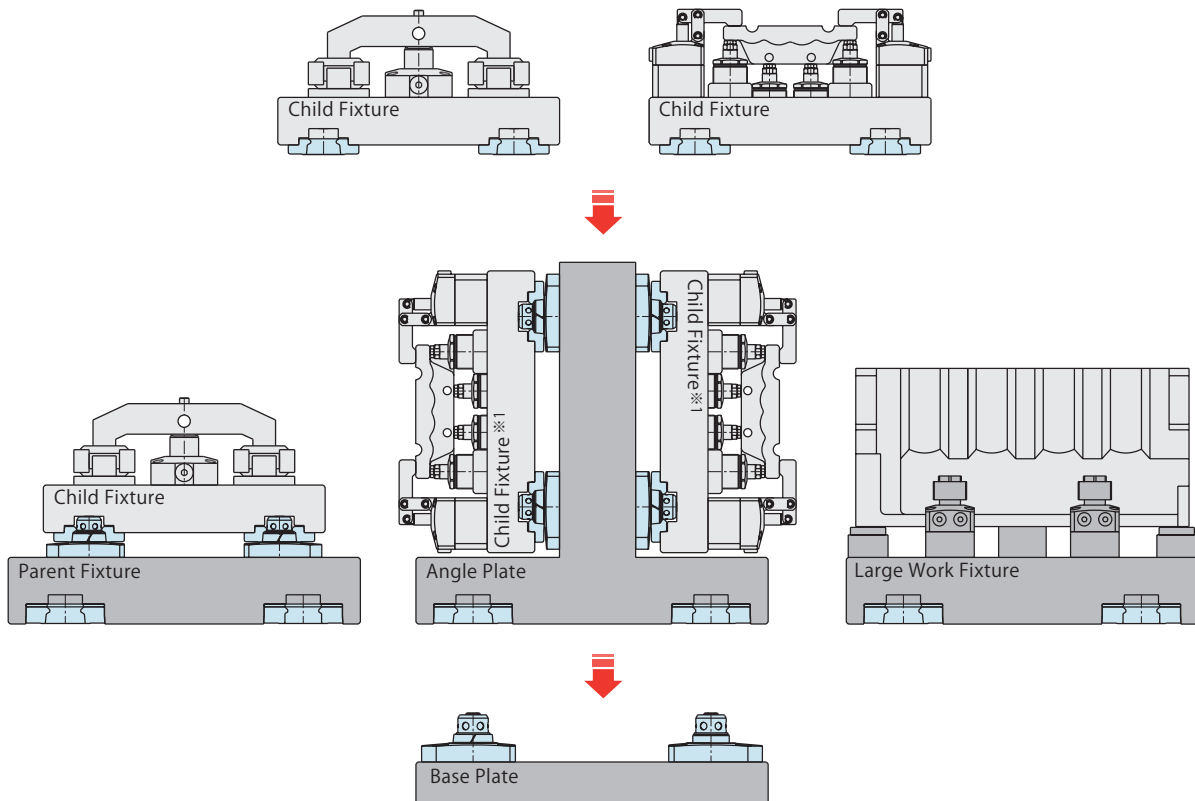
● General Application Sample of Fixture

Optimization with Parent and Child Fixture

- The fixtures used for small size / large size work are divided into child fixture / large work used fixture, so that:
 - The setup operation is simplified and productivity is enhanced.
 - The fixture preparation cost is reduced as only the child.

Fixture needs to be prepared

- As the parent fixture / angle plate / child fixture can share one base plate
 - The fixture preparation cost is reduced.
 - The fixture stocking space is reduced.



Notes

- ※1. In case the pallet (fixture) is in vertical position, the fixture may fall during releasing. It is recommended to set up the latching mechanism to prevent the fixture from falling.
- 1. Even for fixtures with different pallet size, VS/VT clamp and VSB/VSJ block can be combined for use. Installation samples when multiple pallet sizes are used.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA
DBC
Control Valve
BZL
BZT
BZX/JZG
Pallet Clamp
VS
VT
Expansion Locating Pin
VL
VM
VJ
VK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

● Please choose WVS or VS (VT) according to the application.

- The block (VSB/VSJ) attached to pallet side is used for both VS/VT clamp and WVS air pallet clamp.

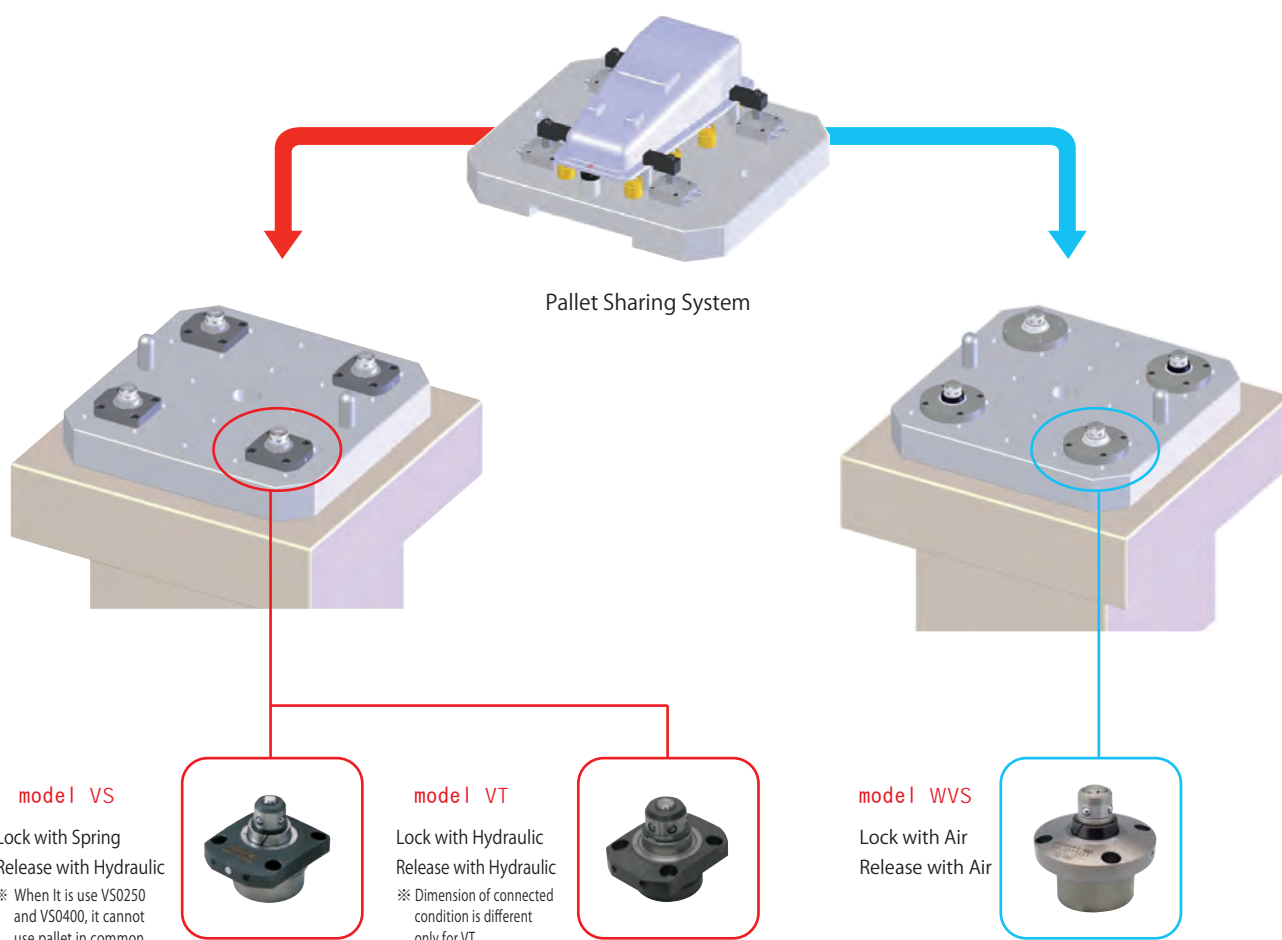
It is selectable from 3 type pallet clamp (VS / VT / WVS) according to application.

Hydraulic Systems

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

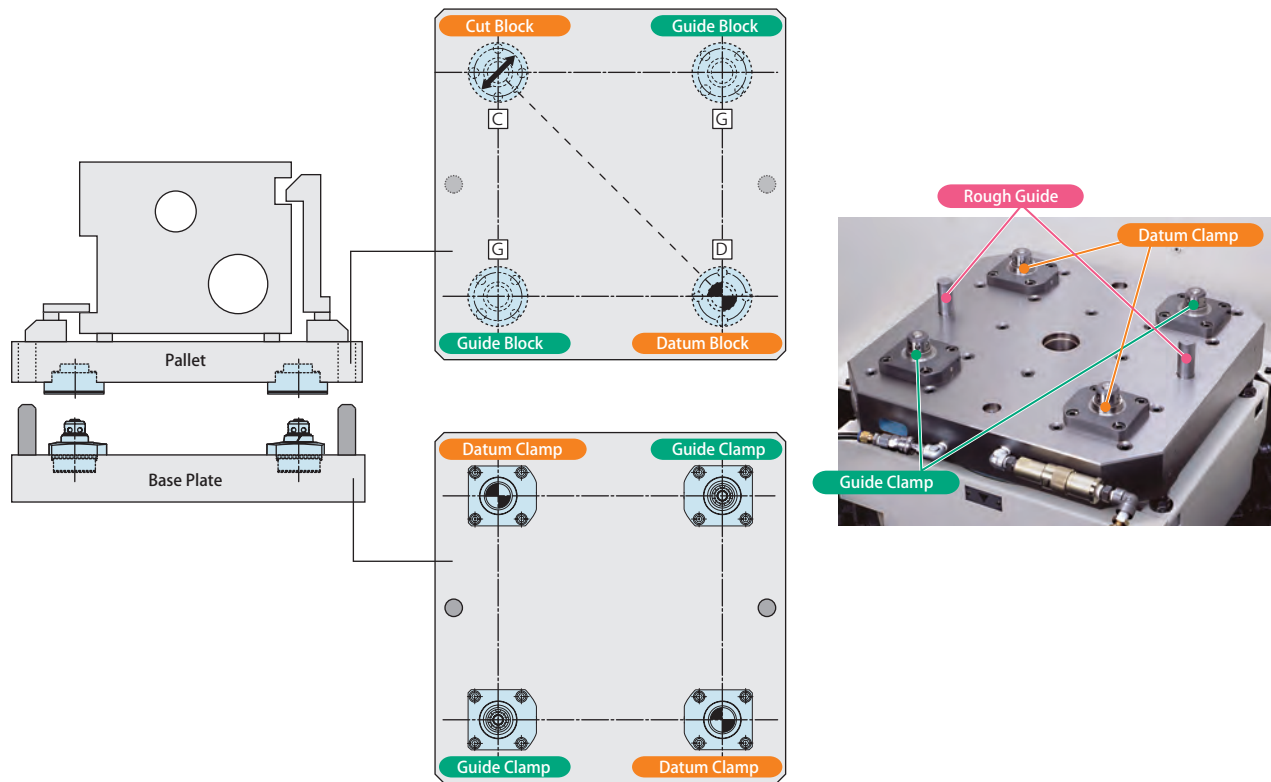
All Pneumatic Systems

- 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

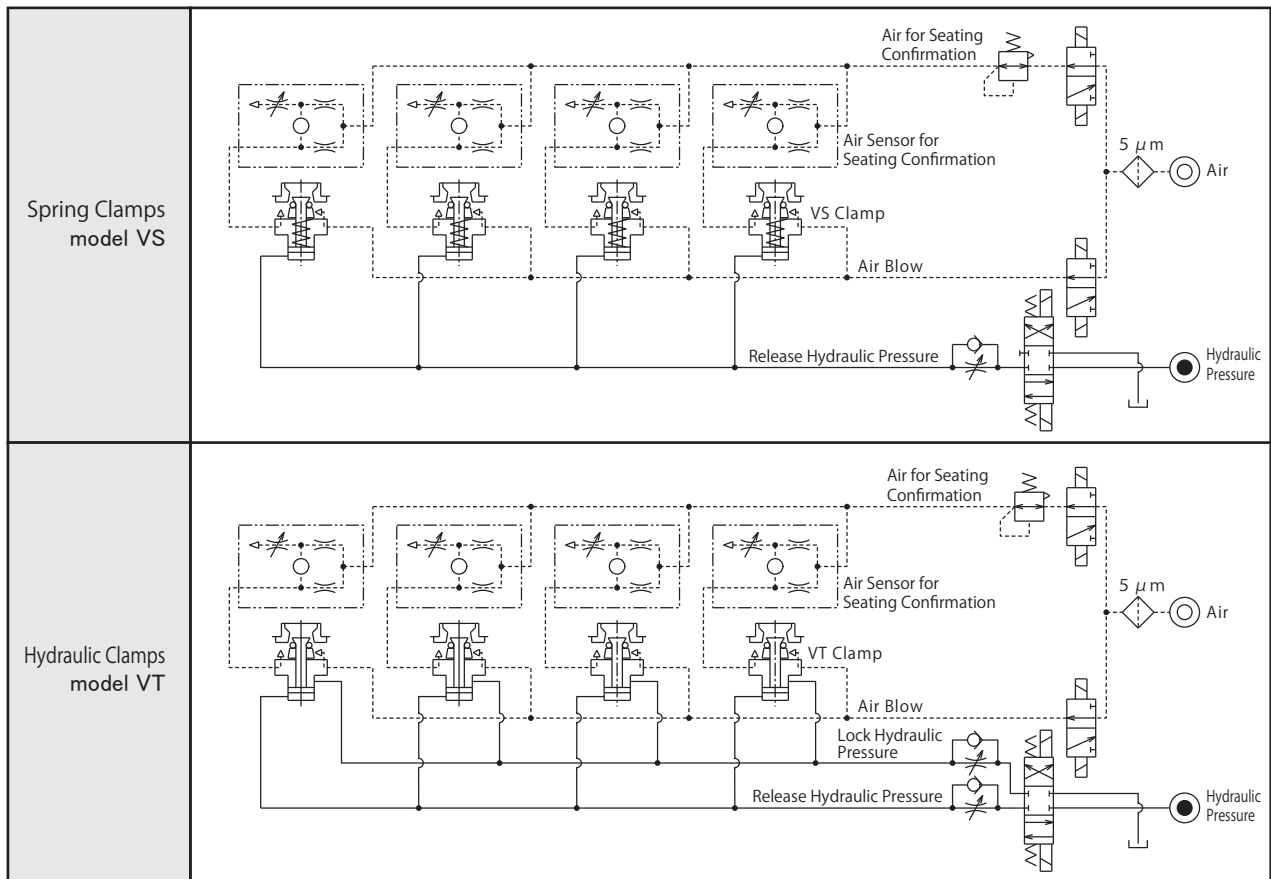


※ The detail form for combination is described at WVT(VS/VT)-VSB/VSJ block compatible table (P.155).

● Pallet Clamp System References



● Circuit Reference

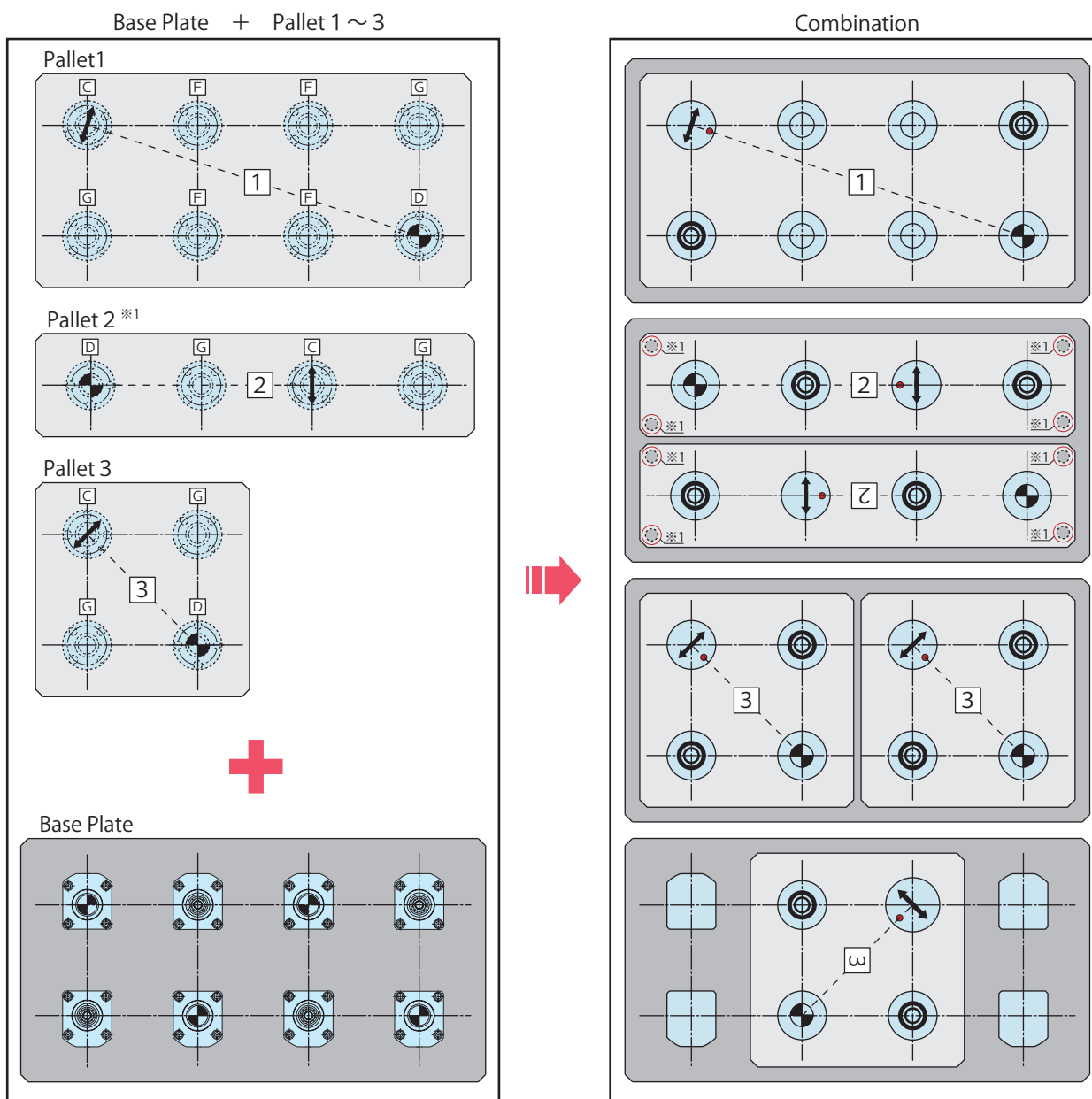


Notes

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.
2. It is recommended to use our non-leakage valve (model BK and BSP) in order to maintain long time release when the hydraulic supply is stopped.

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

Hole Clamp

- SFA
- SFC

Swing Clamp

- LHA
- LHC
- LHS
- LHW
- LT/LG
- TLA-2
- TLB-2
- TLA-1

Link Clamp

- LKA
- LKC
- LKW
- LM/LJ
- TMA-2
- TMA-1

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

- LL
- LLR
- LLU
- DP
- DR
- DS
- DT

Block Cylinder

- DBA
- DBC

Control Valve

- BZL
- BZT
- BZX/JZG

Pallet Clamp

- VS
- VT

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

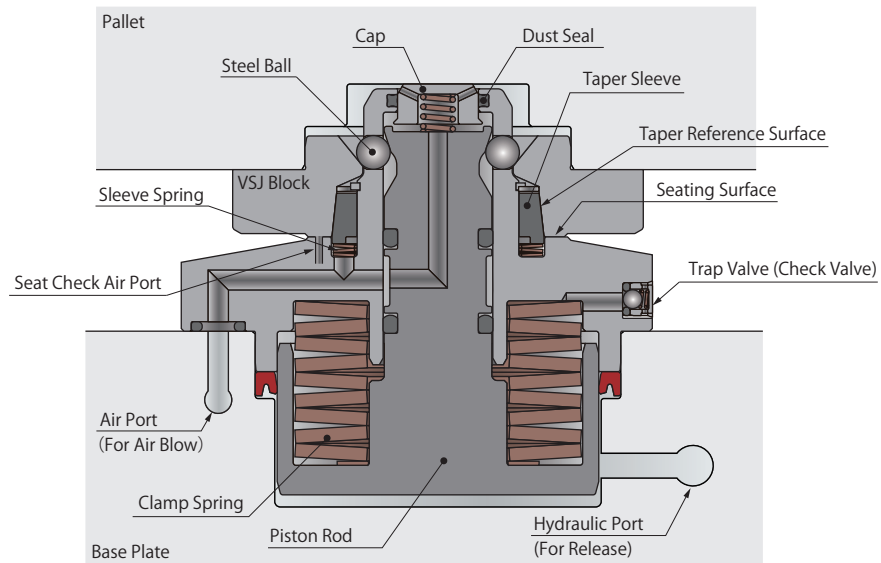
- FP
- FQ

Customized Spring Cylinder

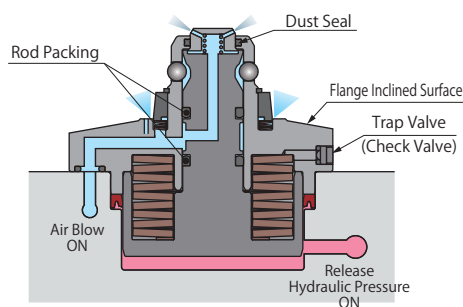
- DWA/DWB

Cross Section

※The graph shows the locking status of VS.



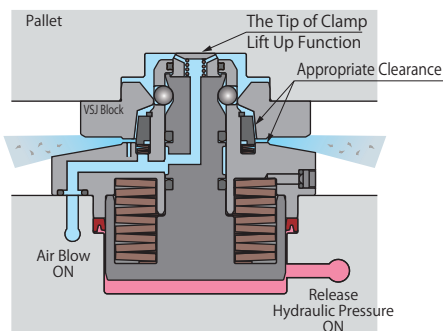
Action Description



Before Loading the Pallet

- Air blow prevents debris contamination.
- Dust seal prevents keep steel ball area clean.
- The flange top is designed as inclined surface so that cutting powder and cutting oil can flow easily.
- The clamp spring chamber is totally shut from the external atmosphere with the rod packing and trap valve to ensure the clean environment.
- The slitting part of taper sleeve (one place) is protected with lever plate to prevent invasion of cutting powder.

After Unloading the Pallet

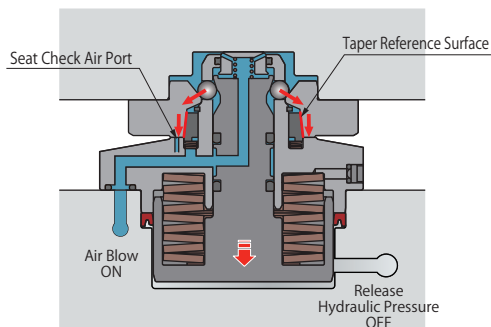


When Loading the Pallet

- 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 blow to remove contaminants. Thanks to the clearance, removing the cutting chips and coolant by air blow is effectively done. And when the pallet is loaded, that prevent it from getting damaged by hitting/scratching and keep high accuracy.
- When the pallet is transported out

When Unloading the Pallet

- The close contacting of taper seating surface is released with lift-up force.



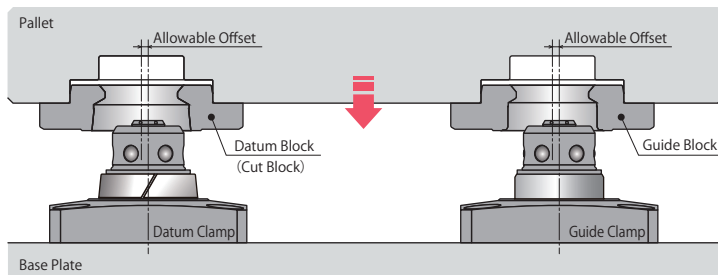
When clamped

- When hydraulic pressured is removed, the spring force lowers the piston rod and the steel balls engage the block bringing it to the seating surface.
- 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).

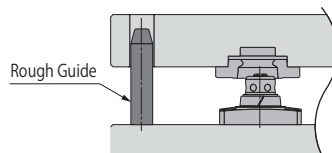
When clamped

● Action Description during Loading/Unloading

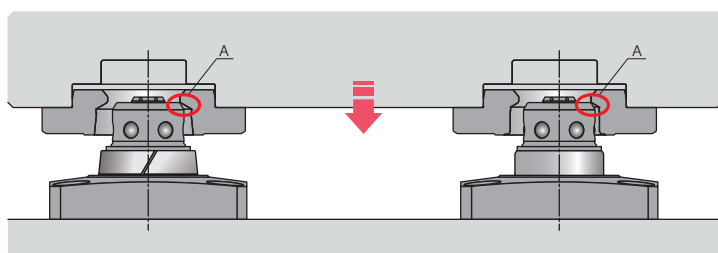
1. Hydraulic pressure releases the clamp. Position of pallet while loading must be kept within the allowable tolerance.
Air should be supplied while loading.



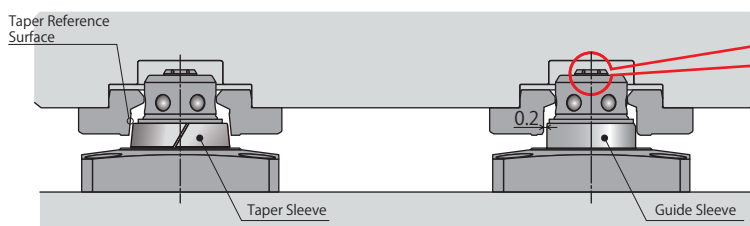
It is recommended to use rough guides to contain the pallet within the allowable eccentricity.



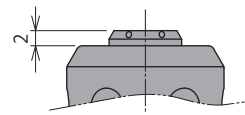
2. When the pallet is lowered, it should be positioned so the blocks contact the rod as shown at A.



3. As the pallet is further lowered, it is positioned within 0.2mm of the reference axis via the guide sleeve and guide block.
This provides clearance between datum clamp and taper surface.

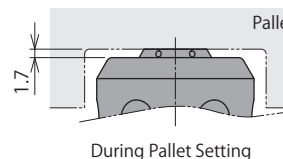
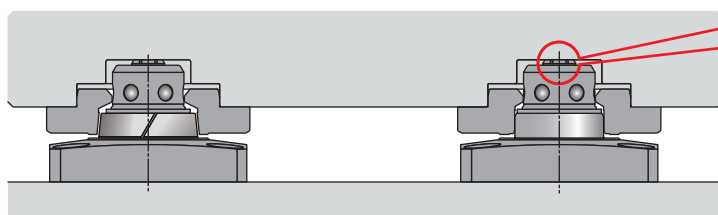


※ Details of Lifting Part

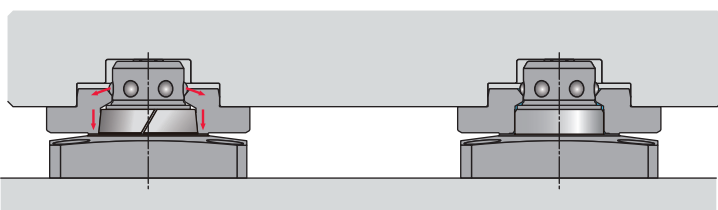


Released State (When hydraulic pressure is supply)

4. Loading is finished when pallet is resting on piston rod. At this time there is clearance for air blow 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 is removed by air blow.



5. When the release hydraulic pressure is OFF, the block is pressed on the seating surface with clamp spring.
When the block is pressed, the taper reference surface is contacted for positioning.



High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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LKW
LM/LJ
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Work Support

LD
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Air Sensing Lift Cylinder

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Block Cylinder

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Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

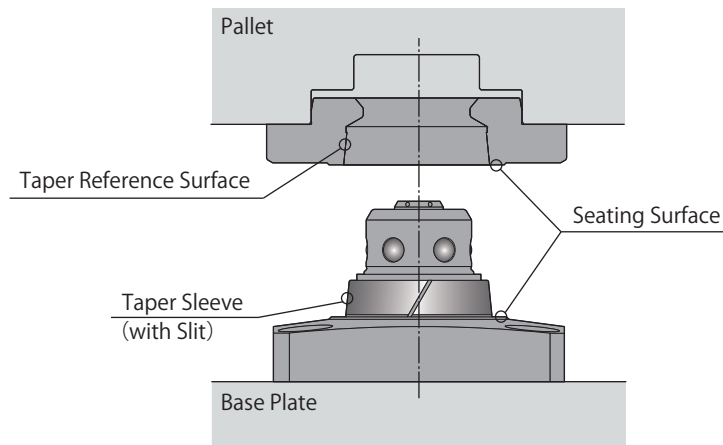
FP
FQ

Customized Spring Cylinder

DWA/DWB

● 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.

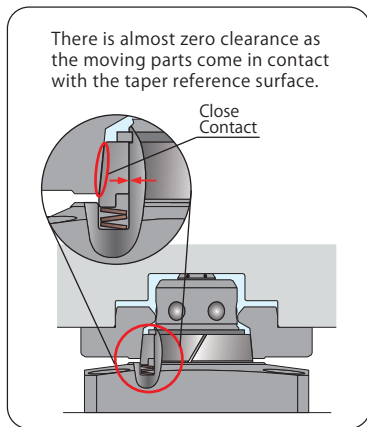
- ① Absorbs tolerance variations in each location clamp and block .
- ② Absorbs wear of locating part due to long time use.
- ③ Absorbs space variations of mounting holes.
- ④ Absorbs space variations due to temperature change.

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

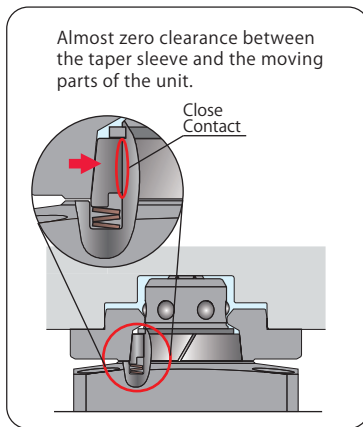
- High-Power Series
- Pneumatic Series
- Hydraulic Series**
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

- Hole Clamp
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 - SFC
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- Link Clamp
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- Control Valve
 - BZL
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- Pallet Clamp**
 - VS**
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- Expansion Locating Pin
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- Pull Stud Clamp
 - FP
 - FQ
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 - DWA/DWB

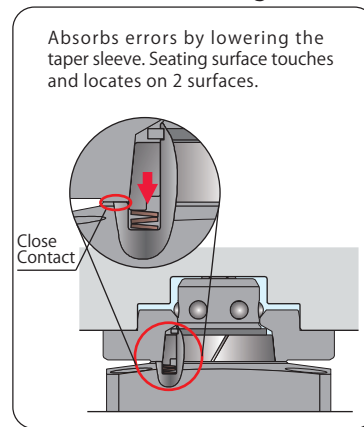
Starting of Action for Locating



XY Locating



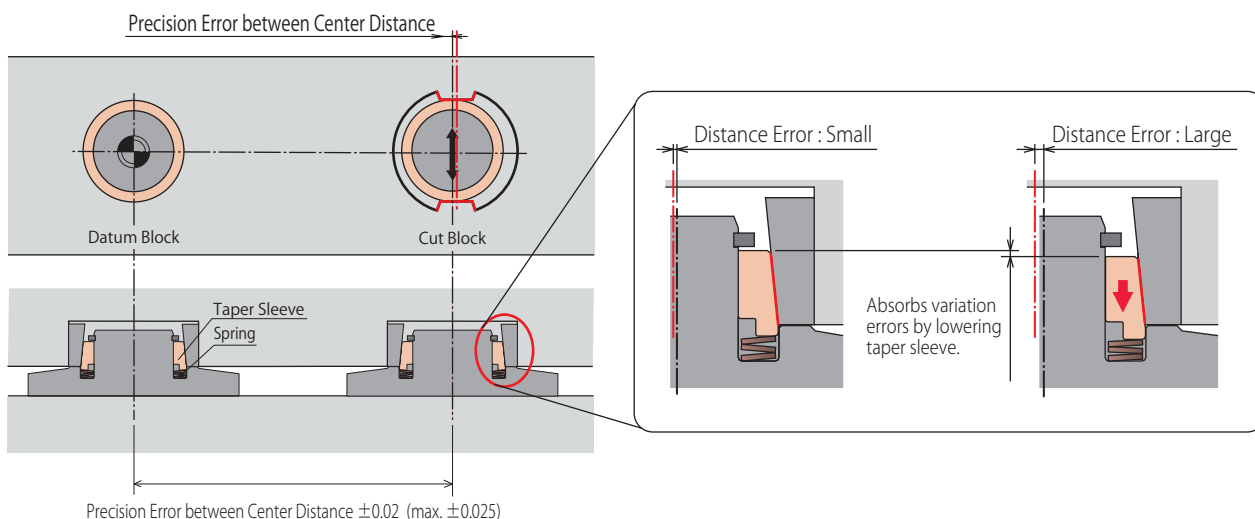
XYZ Locating



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

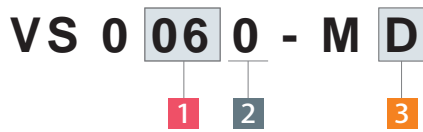
Absorbs distance variations minimizing the wear of locating parts and prevents deformation of clamp/block.

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



Model No. Indication (Clamp)

VS : Spring Clamps



1 Clamping Force

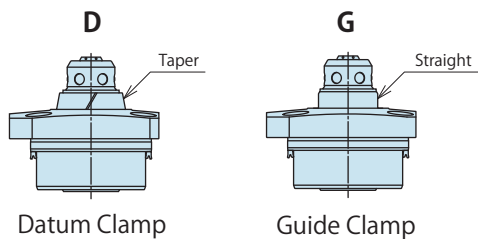
- 02 : Clamping Force 2.5kN
- 04 : Clamping Force 4.0kN
- 06 : Clamping Force 6.0kN
- 10 : Clamping Force 10.0kN
- 16 : Clamping Force 16.0kN
- 25 : Clamping Force 25.0kN
- 40 : Clamping Force 40.0kN

2 Design No.

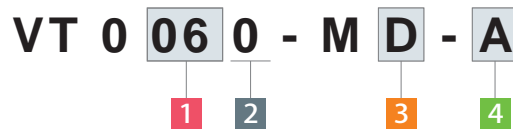
0 : Revision Number

3 Functions

- D : Datum Clamp (Especially Used for Locating)
- G : Guide Clamp (Especially Used for Guide)



VT : Hydraulic Clamps



1 Clamping Force

- 04 : Clamping Force (at 7MPa) 4.0kN
- 06 : Clamping Force (at 7MPa) 6.2kN
- 10 : Clamping Force (at 7MPa) 9.9kN
- 16 : Clamping Force (at 7MPa) 16.0kN

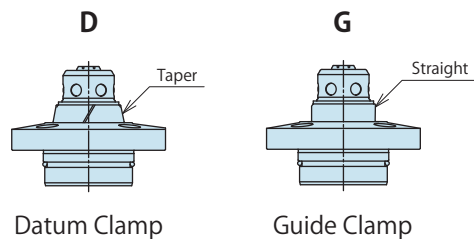
※ The specification in detail is described at clamping force/ lifting up force(oil pressure clamps model VT).

2 Design No.

0 : Revision Number

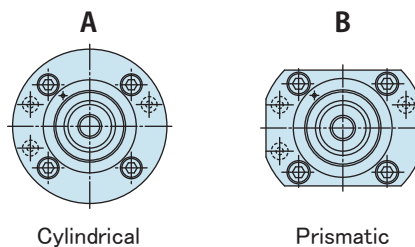
3 Functions

- D : Datum Clamp (Especially Used for Locating)
- G : Guide Clamp (Especially Used for Guide)



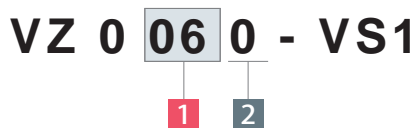
4 Flange Shape

- A : Cylindrical
- B : Prismatic



Model No. Indication (VS's Spacer for Level Adjustment)

※This product is only for VS clamps.



1 Accommodate VS Clamp Model

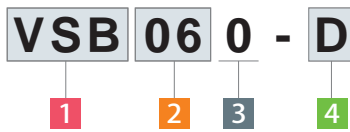
- 02 : VS0020
- 04 : VS0040
- 06 : VS0060
- 10 : VS0100
- 16 : VS0160
- 25 : VS0250
- 40 : VS0400

2 Design No.

0 : Revision Number

Model No. Indication (Block)

VSJ : Flange Shaped Block



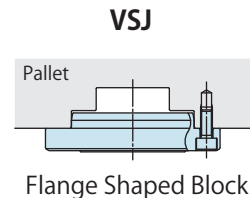
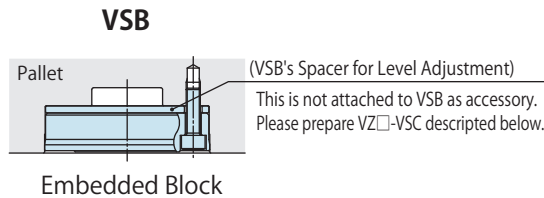
VSJ : Flange Shaped Block



1 Shape of Block

VSJ : Embedded Block

VSJ : Flange Shaped Block



2 Accommodate WVT/VS/VT Clamp Model

02 : VS0020 / VS0040 / VT0040 / WVS0040

06 : VS0060 / VT0060 / WVS0060

10 : VS0100 / VT0100 / WVS0100

16 : VS0160 / VT0160 / WVS0160

25 : VS0250

40 : VS0400

Note 1. WVS is the pallet clamps operated by air.

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)

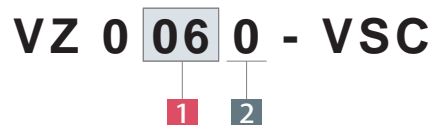
F : Free Block (Shared by Multiple Pallets with Different Sizes)

Combination of Clamp and Block

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

Model No. Indication (VSJ's Spacer for Level Adjustment)

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



1 Accommodate VSJ Block Model

02 : VSB020-□

06 : VSB060-□

10 : VSB100-□

16 : VSB160-□

25 : VSB250-□

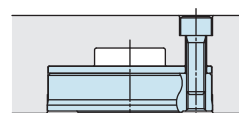
40 : VSB400-□

2 Design No.

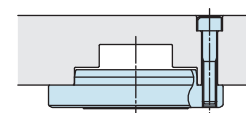
0 : Revision Number

Other Mounting Examples (Reference)

※Please contact us for mounting methods as shown in the graphs 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

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

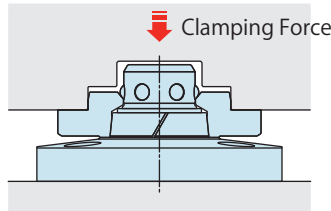
FP
FQ

Customized Spring Cylinder

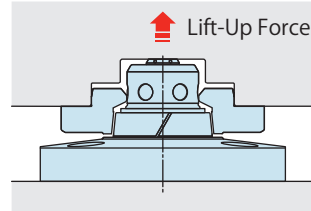
DWA/DWB

● Clamping Force / Lift-up Force (Spring Clamp Model VS)

Model No.		VS0020	VS0040	VS0060	VS0100	VS0160	VS0250	VS0400	
Clamping Force	kN	2.5	4.0	6.0	10.0	16.0	25.0	40.0	
Lift-Up Force	kN	At 7 MPa	4.0	4.4	5.0	9.1	13.3	20.0	33.5
		At 5 MPa	2.2	2.3	2.3	4.7	6.7	10.0	15.5
		At 3.5 MPa	0.9	0.7	0.4	1.3	1.8	0.5	2.0



Clamping force stable because VS clamps with spring.

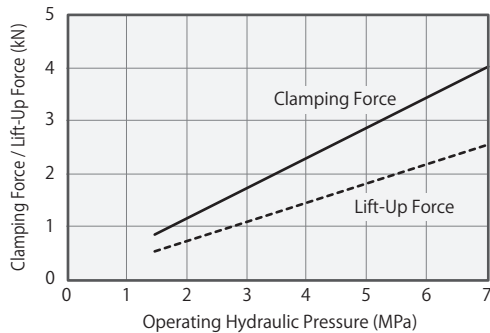


Lift up force varies according to the operating hydraulic pressure.

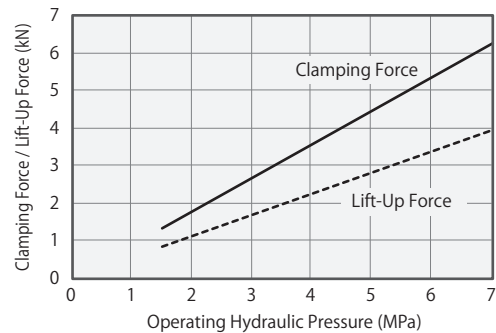
● Clamping Force / Lift-Up Force (Hydraulic Clamp Model VT)

Model No.		VT0040	VT0060	VT0100	VT0160	
Clamping Force	kN	At 7 MPa	4.0	6.2	9.9	16.0
		At 5 MPa	2.9	4.5	7.1	11.4
		At 3.5 MPa	1.7	2.7	4.3	6.8
Lift-Up Force	kN	At 7 MPa	2.5	4.0	6.5	10.2
		At 5 MPa	1.8	2.9	4.7	7.3
		At 3.5 MPa	1.1	1.7	2.8	4.4

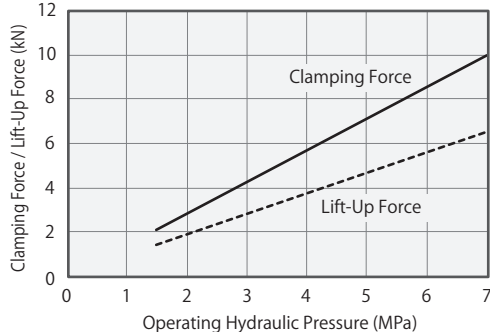
VT0040



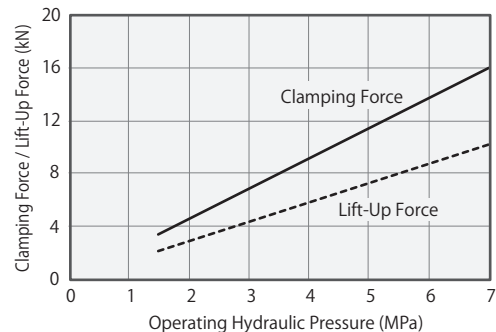
VT0060



VT0100

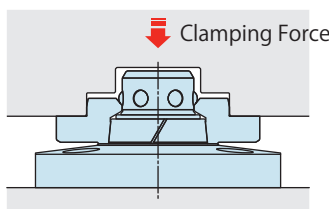


VT0160

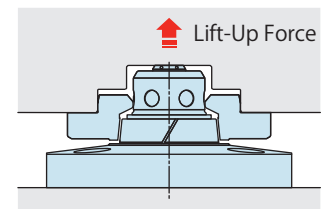


Notes

1. This graph shows one clamp.
2. This graph shows the relationship between the supply hydraulic pressure and the clamping force (solid line)/Lift force (dotted line).



Clamping force is depend on operating hydraulic pressure because VT is designed to be operated by hydraulic double action.

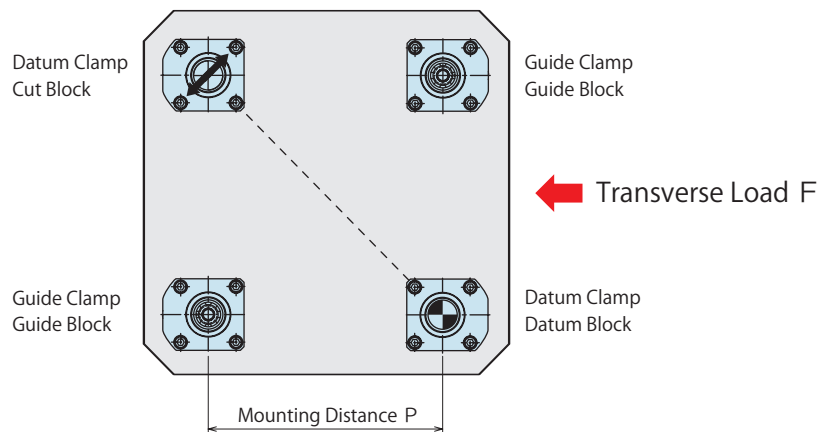


Lift up force varies according to the operating hydraulic pressure.

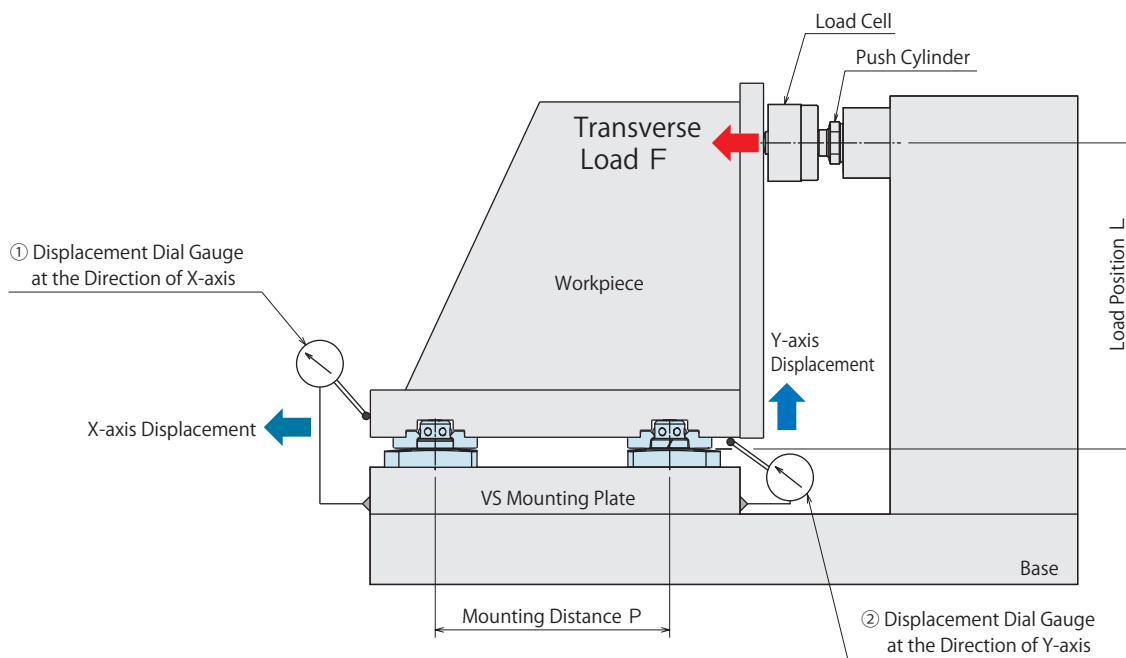
Displacement against Transverse Load

※The displacement is the predicted reference value on the basis of test data under the conditions shown below.

Clamp / Block Layout



Test Device



How to read the displacement
(Example) When using VS0020

Components

[Clamp]

- VS0020-MD×2 Units
- VS0020-MG×2 Units
- [Block]
- VSJ020-D×1 Unit
- VSJ020-C×1 Unit
- VSJ020-G×2 Units

Requirements

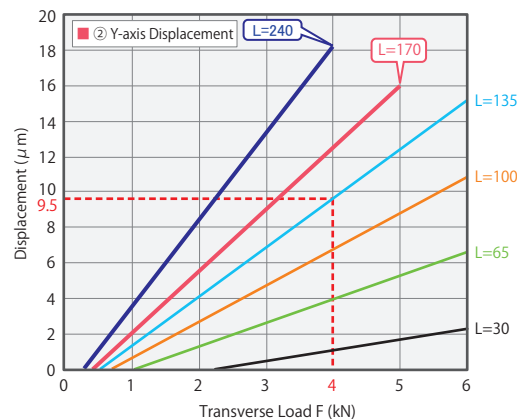
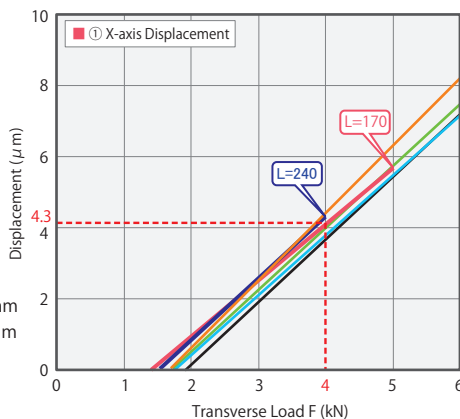
- Mounting Distance P=200mm
- Load Position L=135mm
- Transverse Load F=4kN

Displacement

- ① X-axis displacement is about 4.3 μm.
- ② Y-axis displacement is about 9.5 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

Hole Clamp
SFA
SFC

Swing Clamp
LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support
LD
LC
TNC
TC

Air Sensing Lift Cylinder
LLW

Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder
DBA
DBC

Control Valve
BZL
BZT
BZX/JZG

Pallet Clamp
VS
VT

Expansion Locating Pin
VL
VM
VJ
VK

Pull Stud Clamp
FP
FQ

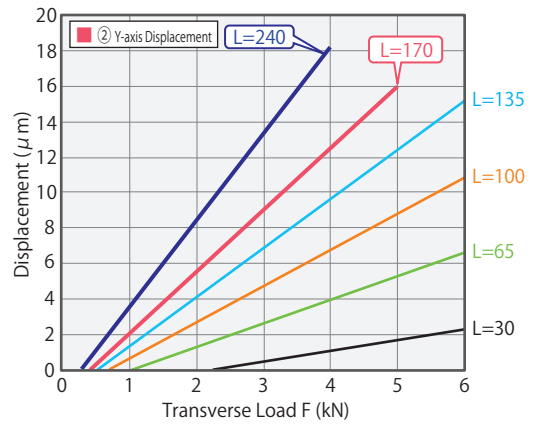
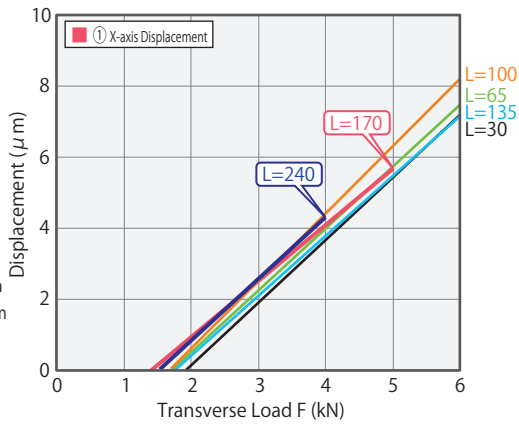
Customized Spring Cylinder
DWA/DWB

Displacement against Transverse Load

※ The displacement is the predicted reference value on the basis of test data under the conditions as shown on P.754 .

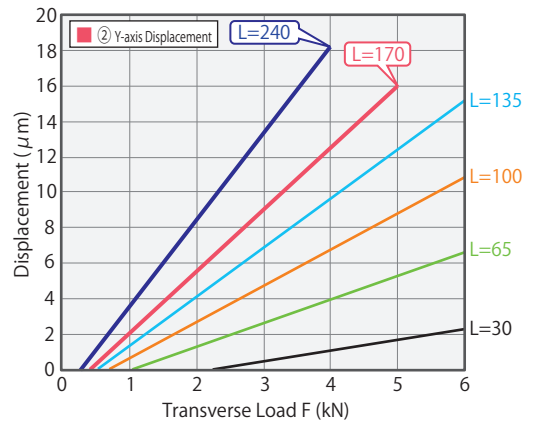
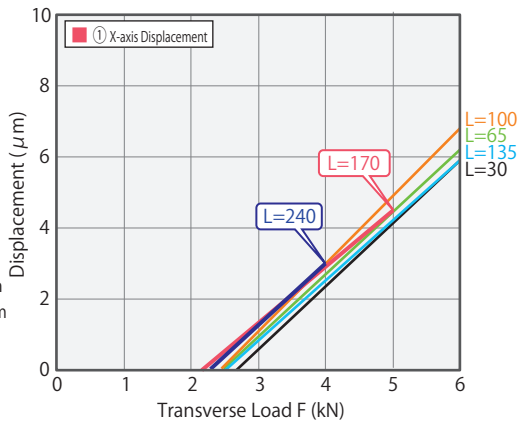
VS0020

- Components
 - [Clamp] VS0020-MD×2 Units
 - VS0020-MG×2 Units
 - [Block] VSJ020-D×1 Unit
 - VSJ020-C×1 Unit
 - VSJ020-G×2 Units
- Requirements
 - Mounting Distance P=200mm
 - Load Position L=30~240mm
- Clamping Force
 - Total 10kN (2.5kN×4)



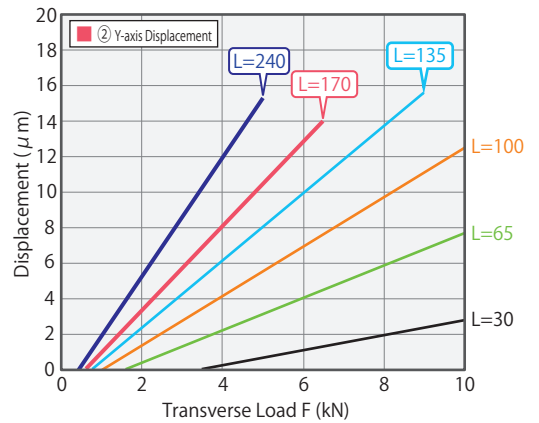
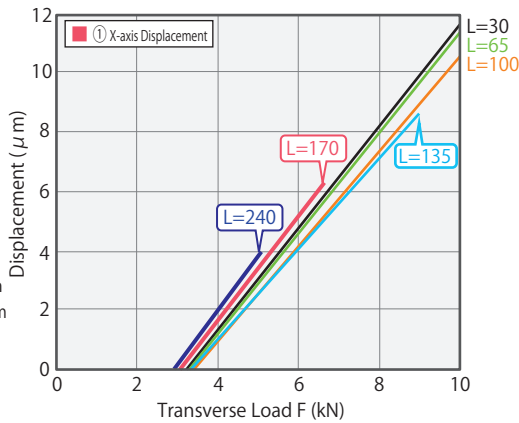
VS0040

- Components
 - [Clamp] VS0040-MD×2 Units
 - VS0040-MG×2 Units
 - [Block] VSJ020-D×1 Unit
 - VSJ020-C×1 Unit
 - VSJ020-G×2 Units
- Requirements
 - Mounting Distance P=200mm
 - Load Position L=30~240mm
- Clamping Force
 - Total 16kN (4kN×4)



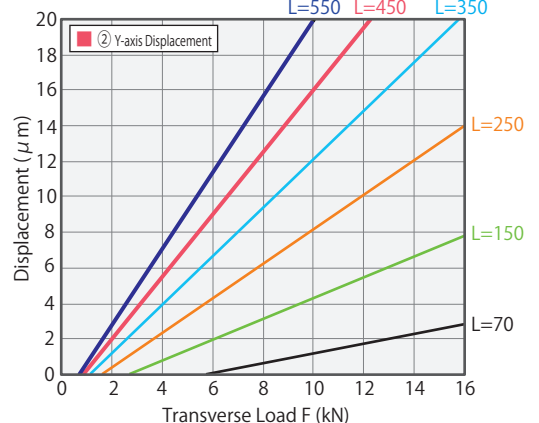
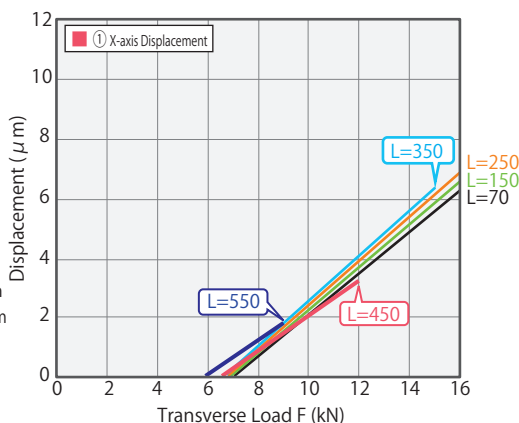
VS0060

- Components
 - [Clamp] VS0060-MD×2 Units
 - VS0060-MG×2 Units
 - [Block] VSJ060-D×1 Unit
 - VSJ060-C×1 Unit
 - VSJ060-G×2 Units
- Requirements
 - Mounting Distance P=200mm
 - Load Position L=30~240mm
- Clamping Force
 - Total 24kN (6kN×4)



VS0100

- Components
 - [Clamp] VS0100-MD×2 Units
 - VS0100-MG×2 Units
 - [Block] VSJ100-D×1 Unit
 - VSJ100-C×1 Unit
 - VSJ100-G×2 Units
- Requirements
 - Mounting Distance P=300mm
 - Load Position L=70~550mm
- Clamping Force
 - Total 40kN (10kN×4)



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

Hole Clamp
SFA
SFC

Swing Clamp
LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support
LD
LC
TNC
TC

Air Sensing Lift Cylinder
LLW

Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder
DBA
DBC

Control Valve
BZL
BZT
BZX/JZG

Pallet Clamp
VS
VT

Expansion Locating Pin
VL
VM
VJ
VK

Pull Stud Clamp
FP
FQ

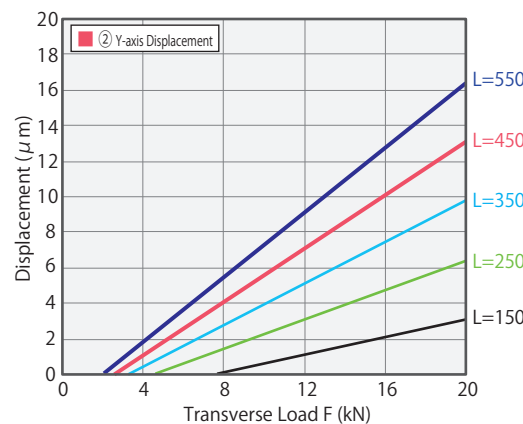
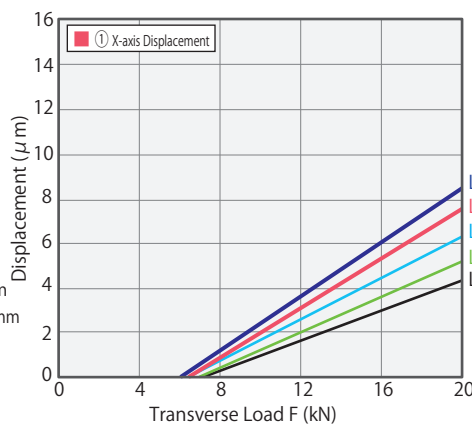
Customized Spring Cylinder
DWA/DWB

VS0160

- Components
 - [Clamp] VS0160-MD×2 Units VS0160-MG×2 Units
 - [Block] VSJ160-D×1 Unit VSJ160-C×1 Unit VSJ160-G×2 Units

- Requirements
 - Mounting Distance P=300mm
 - Load Position L=150~550mm

- Clamping Force
 - Total 64kN (16kN×4)

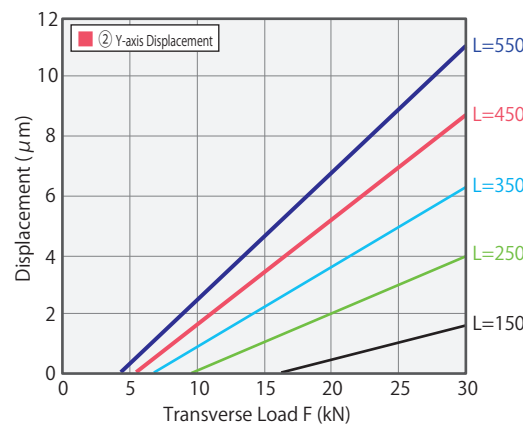
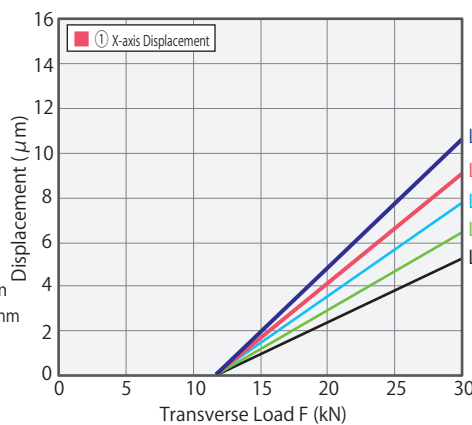


VS0250

- Components
 - [Clamp] VS0250-MD×2 Units VS0250-MG×2 Units
 - [Block] VSJ250-D×1 Unit VSJ250-C×1 Unit VSJ250-G×2 Units

- Requirements
 - Mounting Distance P=375mm
 - Load Position L=150~550mm

- Clamping Force
 - Total 100kN (25kN×4)

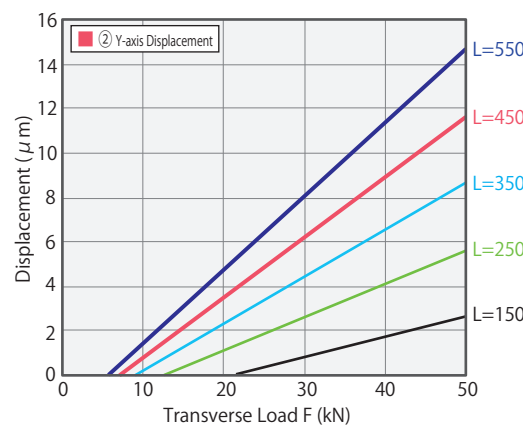
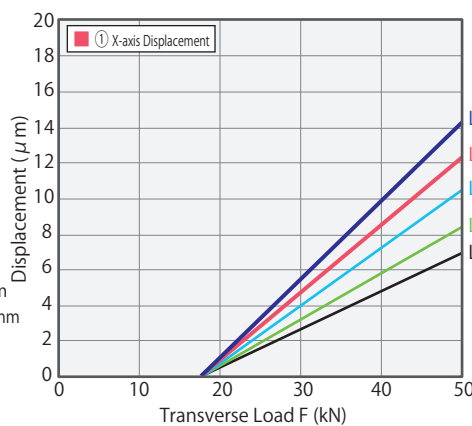


VS0400

- Components
 - [Clamp] VS0400-MD×2 Units VS0400-MG×2 Units
 - [Block] VSJ400-D×1 Unit VSJ400-C×1 Unit VSJ400-G×2 Units

- Requirements
 - Mounting Distance P=375mm
 - Load Position L=150~550mm

- Clamping Force
 - Total 160kN (40kN×4)

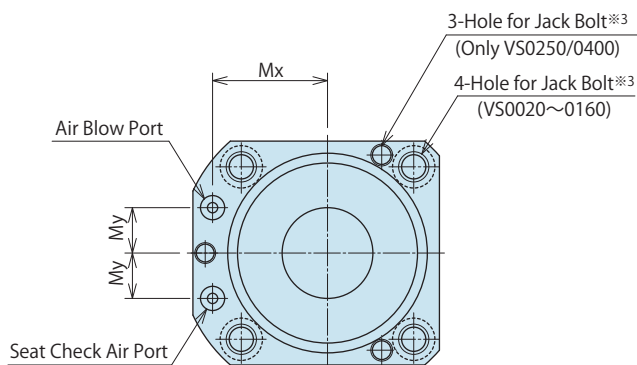
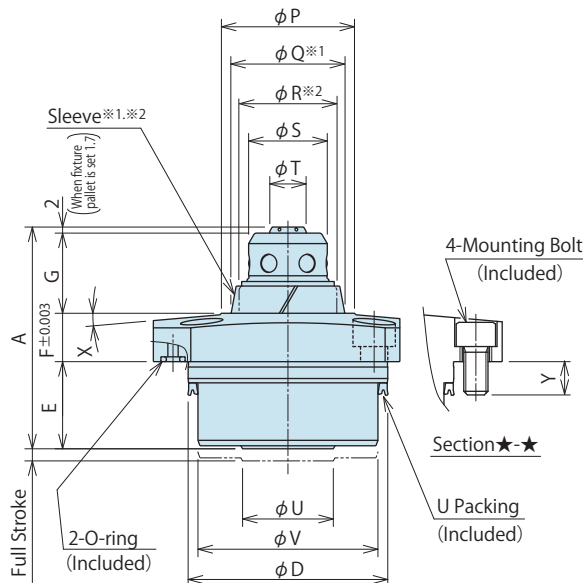
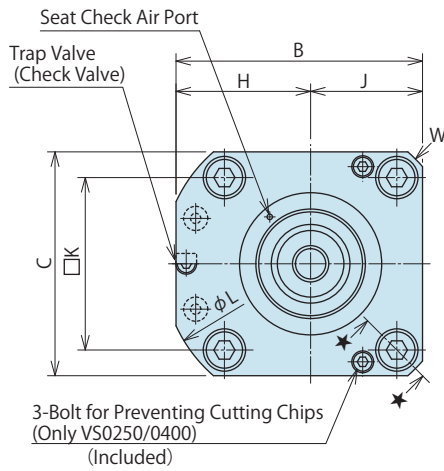


Note

1. The displacement may vary as per the fixture condition. The displayed values are just for reference based on the test data.

External Dimensions

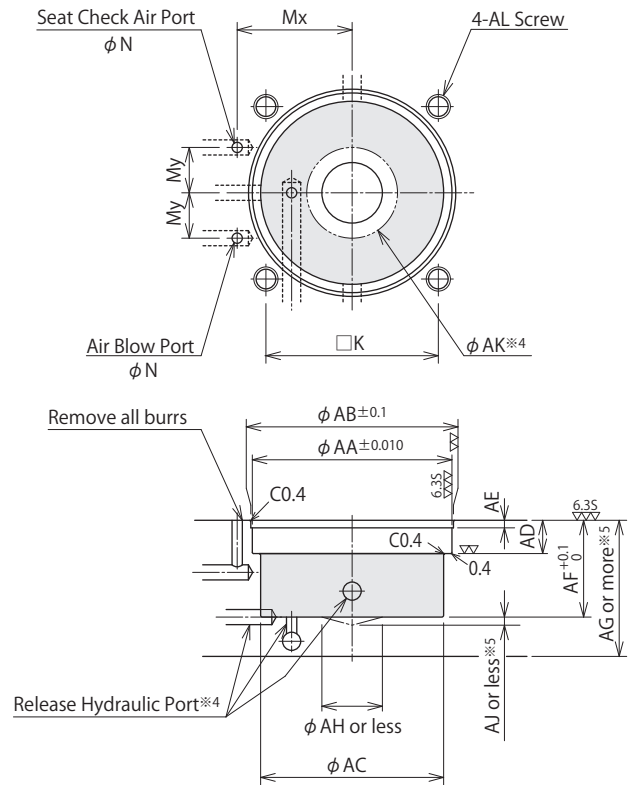
※This drawing shows the released state of VS.
(When supplying release hydraulic pressure)



Notes

- ※1. ϕQ shows the dimensions of sleeve (taper) of datum clamp (VS-MD).
- ※2. ϕR shows the dimensions of sleeve (straight) of guide clamp (VS-MG).
- ※3. The screw for jack is used when the clamp is removed.
(See P.772 for operation method)

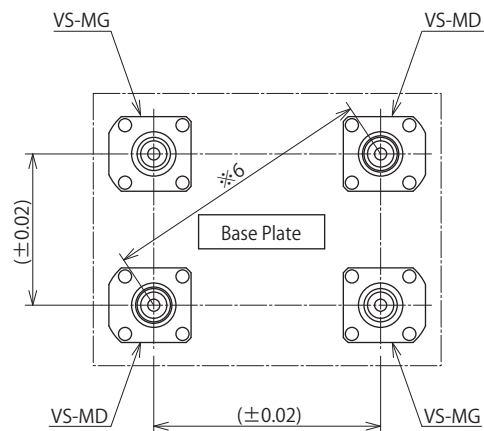
Machining Dimensions of Mounting Area



Notes

- 1. There should be no burrs at the intersection of processed hole.
- ※4. The release hydraulic port is within $\square K$ range.
- ※5. The base thickness (AG) and remaining depth after boring (AI) are reference values when the base material is S50C.

Distance Accuracy of Each Clamp



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 No.	VS0020-M□	VS0040-M□	VS0060-M□	VS0100-M□	VS0160-M□	VS0250-M□	VS0400-M□		
Clamping Force ^{※7}	kN	2.5	4.0	6.0	10.0	16.0	25.0	40.0	
Locating Repeatability	mm	0.003							
Full Stroke	mm	3.4	3.4	3.4	4.0	4.5	5.8	6.5	
Lift Up Stroke	mm	1.0							
Offset Tolerance when fixture pallet is set	mm	1.5	1.5	1.5	2.0	2.0	2.5	2.5	
Lift Up Force ^{※7}	kN	at 7.0MPa	4.0	4.4	5.0	9.1	13.3	20.0	33.5
		at 5.0MPa	2.2	2.3	2.3	4.7	6.7	10.0	15.5
		at 3.5MPa	0.9	0.7	0.4	1.3	1.8	0.5	2.0
Max. Loading Weight ^{※8}	kg	500	500	800	1200	1600	2500	4000	
Releasing Cylinder Capacity ^{※7}	cm ³	3.7	4.6	5.5	11.1	18.5	37.7	66.9	
Releasing Hydraulic Pressure	MPa	7.0							
	MPa	3.5							
	MPa	10.5							
Operating Air Pressure (For Air Blow)	MPa	0.4 ~ 0.5							
Operating Temperature	°C	0 ~ 70							
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32							
Mass ^{※7}	kg	0.4	0.5	0.7	1.3	2.2	4.8	9.7	

Notes ^{※7}. The specifications show one unit.

^{※8}. The maximum load weight indicates the case where four clamps are used and the pallet is in horizontal position (leveled).
The release hydraulic 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).
When the pallet is in vertical position, please refer to P.771.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	VS0020-M□	VS0040-M□	VS0060-M□	VS0100-M□	VS0160-M□	VS0250-M□	VS0400-M□
A	51.8	56.6	59.7	72.5	85.1	109.2	134.5
B	57	60.5	67	81.5	98.5	118	152
C	48	51	59	74	89	108	140
D	42 ^{+0.027 -0.011}	46 ^{+0.027 -0.011}	52m6 ^{+0.030 -0.011}	66m6 ^{+0.030 -0.011}	79m6 ^{+0.030 -0.011}	98m6 ^{+0.035 -0.013}	124 ^{+0.035 -0.013}
E	15.8	20.6	22.2	28	33.6	45.2	56
F	12	12	13.5	16	20	26	32
G	22	22	22	26.5	29.5	36	44.5
H	33	35	37.5	44.5	54	64	82
J	24	25.5	29.5	37	44.5	54	70
K	37	40	46	57	68.5	85	109
L	69	74	79	98	118	143	185
Mx	27.5	29.5	32	38	46.5	56	72
My	9	11	11	15	15	18.5	20
N	3	3	3	3.3	5	5	6
P	32	32	35.5	44	51	68	84
Q ^{※1}	25	25	28.5	36	42	55.5	67.5
R ^{※2}	22.5	22.5	26	32.3	38.3	48	60
S	18	18	20	26	32	40	50
T	8	8	10	12	15	20	24
U	20	20	24	30	40	50	55
V	37.3	41.3	45.5	59.5	72.5	91	114.5
W	C2	C2	φ79	φ98	φ118	φ143	φ185
X	7.5°	7.5°	7.5°	5°	5°	5°	5°
Y	8	8	9.5	11	13.5	20	24.2
AA	42	46	52	66	79	98	124
AB	42.2	46.2	52.2	66.2	79.2	98.2	124.2
AC	38	42	46.2	60.5	73.5	92	116
AD	8.5	8.5	10	11	11	12.5	16
AE	2	2	2	2.5	2.5	3	3
AF	19.2	24	25.6	32	38.1	51	62.5
AG ^{※5}	25	30	30	40	45	60	75
AH	15	15	20	25	35	45	50
AJ ^{※5}	2.5	2.5	1	2.5	1	1.5	2
AK	20	20	24	30	40	50	55
AL(Nominal×Pitch×Depth)	M5×0.8×9	M5×0.8×9	M6×1×11	M8×1.25×12	M10×1.5×5	M12×1.75×22	M16×2×25
Mounting Bolt	M5×0.8×12	M5×0.8×12	M6×1×14	M8×1.25×16	M10×1.5×20	M12×1.75×30	M16×2×35
Bolt for Preventing Cutting Chips	-	-	-	-	-	M6×1×10	M8×1.25×12
3-Hole for Jack Bolt	-	-	-	-	-	M6×1	M8×1.25
4-Hole for Jack Bolt	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75	-	-
O-ring	1AP5	1AP5	1AP5	1AP5	1AP7	1AP7	1AP8
Full Stroke	3.4	3.4	3.4	4.0	4.5	5.8	6.5

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

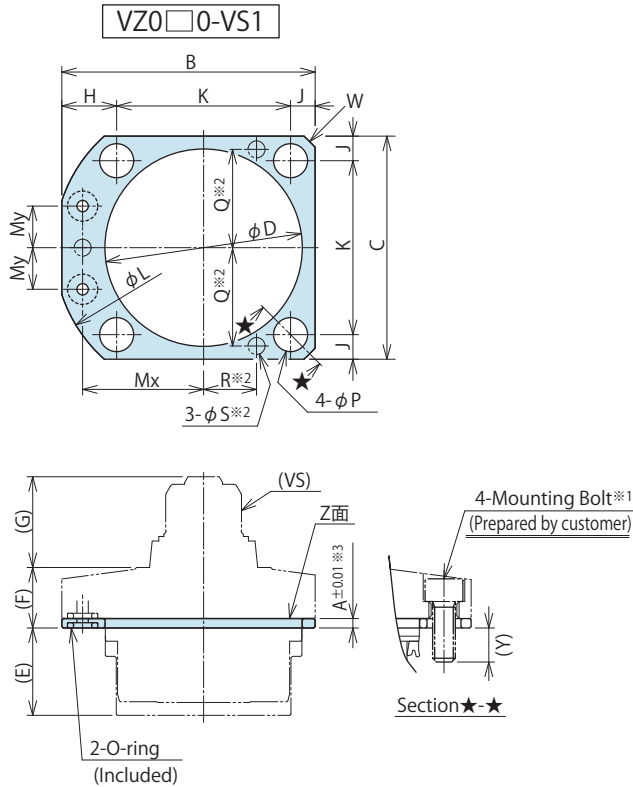
Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

External Dimensions

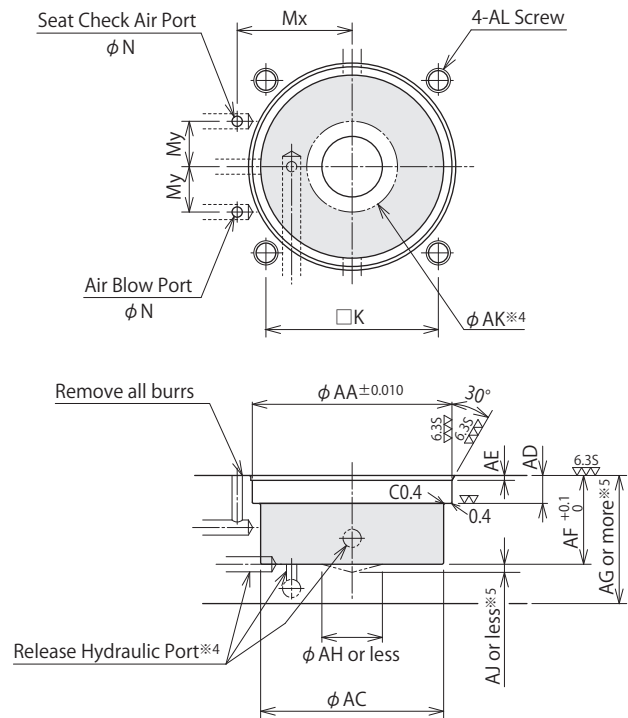


Notes

- ※1. When VZ-VS1 is used, the mounting bolts for VS clamp should not be used because of insufficient length. The client needs to provide the mounting bolts for VZ-VS1.
- ※2. These are only the dimensions for VZ0250-VS1 and VZ0400-VS1.
- ※3. Please grind Z surface when adjusting the thickness.

Machining Dimensions of Mounting Area

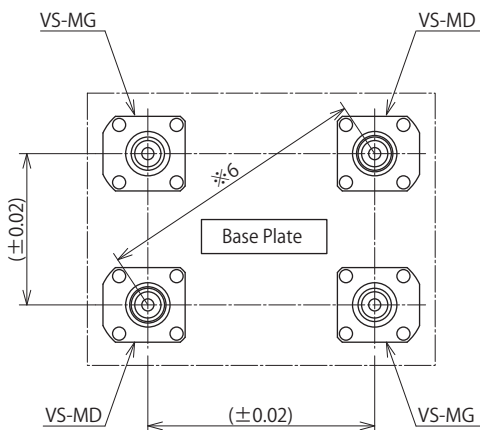
(VZ-VS1 when using spacer for leveling adjustment)



Notes

- 1. When VZ-VS1 is used, please drill the mounting hole as shown in the graph above.
- 2. There should be no burrs at the intersection of processed hole.
- ※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.

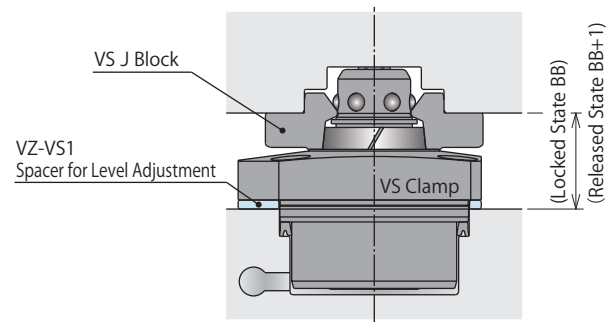
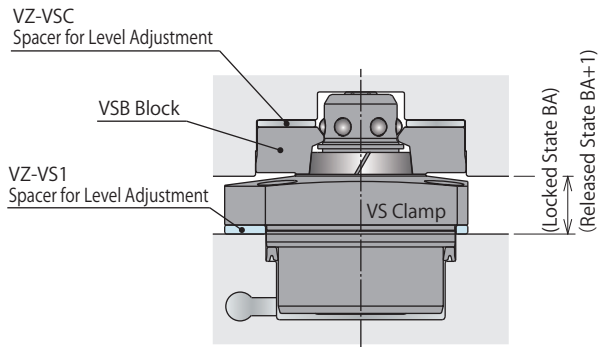
Distance Accuracy of Each Clamp



Note

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

Connection Dimensions



External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	VZ0020-VS1	VZ0040-VS1	VZ0060-VS1	VZ0100-VS1	VZ0160-VS1	VZ0250-VS1	VZ0400-VS1
Accommodate Clamp Model	VS0020-MD VS0020-MG	VS0040-MD VS0040-MG	VS0060-MD VS0060-MG	VS0100-MD VS0100-MG	VS0160-MD VS0160-MG	VS0250-MD VS0250-MG	VS0400-MD VS0400-MG
A	2	2	2.5	3	3	3.5	4
B	57	60.5	67	81.5	98.4	118	152
C	48	51	59	74	88.9	108	140
D	42.2	46.2	52.2	66.2	79.2	98.2	124.2
E	17.2	22	23.1	29	35.1	47.2	58.5
F	14	14	16	19	23	29.5	36
G	24	24	24	28.5	31.5	38	46.5
H	14.5	15	14.5	16	19.7	21.5	27.5
J	5.5	5.5	6.5	8.5	10.2	11.5	15.5
K	37	40	46	57	68.5	85	109
L	69	74	79	98	118	143	185
Mx	27.5	29.5	32	38	46.5	56	72
My	9	11	11	15	15	18.5	20
N	3	3	3	3.3	5	5	6
P	6.8	6.8	9	11	13	16	18
Q ^{*2}	-	-	-	-	-	47.5	61.5
R ^{*2}	-	-	-	-	-	26.5	34
S ^{*2}	-	-	-	-	-	8	10
W	C2	C2	φ79	φ98	φ118	φ143	φ185
Y	8	8	9	12	15.5	21.5	25.2
AA	42	46	52	66	79	98	124
AC	38	42	46.2	60.5	73.5	92	116
AD	6.5	6.5	7.5	8	8	9	12
AE	0.6	0.6	0.6	0.6	0.6	0.6	0.8
AF	17.2	22	23.1	29	35.1	47.5	58.5
AG ^{*4}	23	28	28	37	42	57	71
AH	15	15	20	25	35	45	50
AJ ^{*4}	2.5	2.5	1	2.5	1	1.5	2
AK	20	20	24	30	40	50	55
AL(Nominal×Pitch×Depth)	M5×0.8×9	M5×0.8×9	M6×1×10	M8×1.25×13	M10×1.5×17	M12×1.75×24	M16×2×26
Mounting Bolt ^{*1}	M5×0.8×14	M5×0.8×14	M6×1×16	M8×1.25×20	M10×1.5×25	M12×1.75×35	M16×2×40
O-ring	1AP5	1AP5	1AP5	1AP5	1AP7	1AP7	1AP8
When using VSB, BA	13.5	13.5	15.5	18.5	22.5	29	35.5
When using VSJ, BB	22	22	26	29	35	44.5	54

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support

LD
LC
TNC
TCAir Sensing
Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VTExpansion
Locating PinVL
VM
VJ
VK

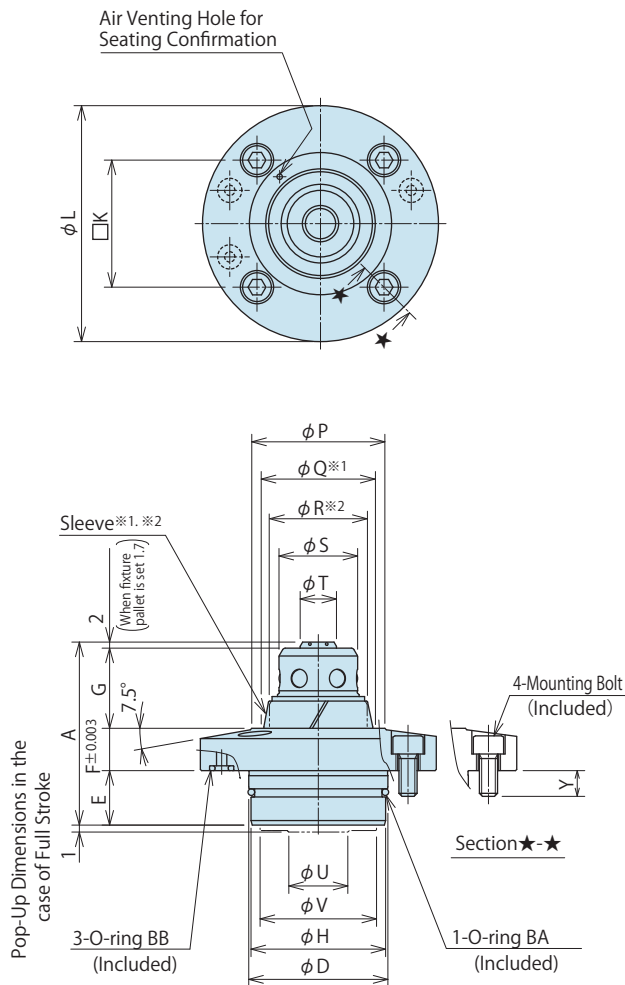
Pull Stud Clamp

FP
FQCustomized
Spring Cylinder

DWA/DWB

External Dimensions

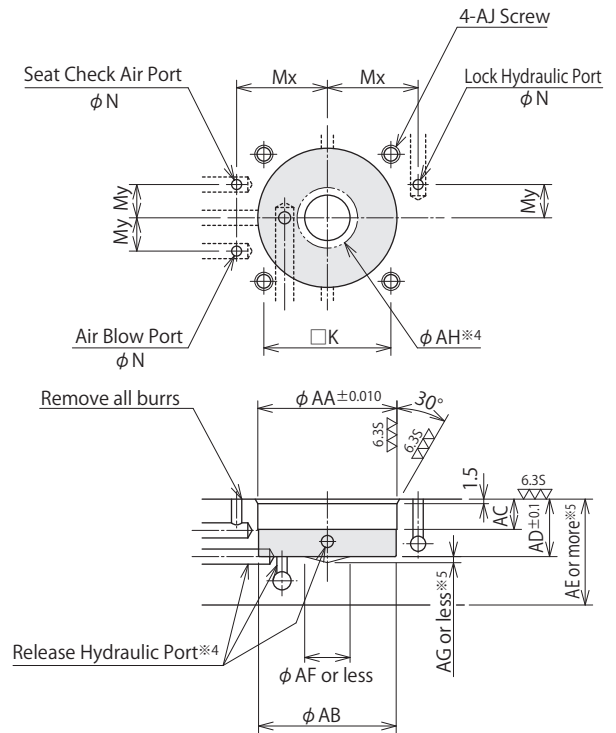
※This drawing shows the released state of VT-A.
(When supplying release hydraulic pressure)



Notes

- ※1. φ Q shows the dimensions of sleeve (taper) of datum clamp (VS-MD).
- ※2. φ R shows the dimensions of sleeve (straight) of guide clamp (VS-MG).
- ※3. The screw for jack is used when the clamp is removed.
(See P.772 for operation method)

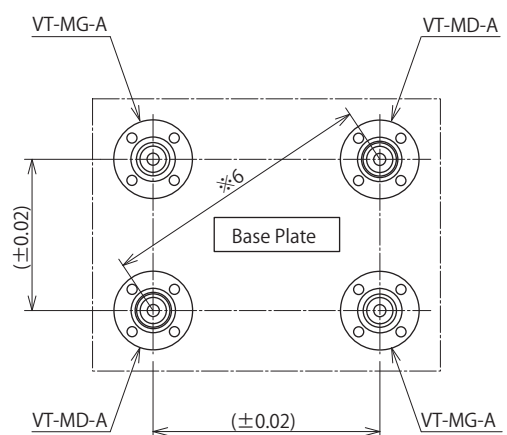
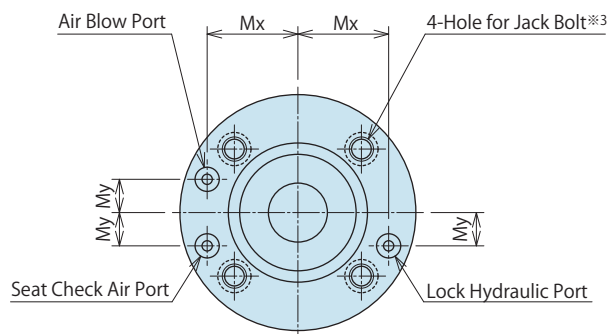
Machining Dimensions of Mounting Area



Notes

- 1. There should be no burrs at the intersection of processed hole.
- ※4. The release hydraulic port is within □ range.
- ※5. The base thickness (AG) and remaining depth after boring (AE) are reference values when the base material is S50C.

Distance Accuracy of Each Clamp



Note

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

Specifications

Model No.	VT0040-M□-A	VT0060-M□-A	VT0100-M□-A	VT0160-M□-A
Locating Repeatability	mm 0.003			
Clamping Force (Calculation Formula) ^{※7} ※8kN	0.57×P	0.89×P	1.42×P	2.28×P
Lift Up Force (Calculation Formula) ^{※7} ※8 kN	0.36×P	0.57×P	0.93×P	1.45×P
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 1.5 1.5 2.0 2.0			
Max. Loading Weight ^{※9}	kg 500 800 1200 1600			
Cylinder Capacity ^{※8} cm ³	Lock	1.1	1.9	3.5
	Release	1.5	2.4	4.7
Max. Operating Pressure	MPa 7.0			
Min. Operating Pressure	MPa 1.5			
Withstanding Pressure	MPa 10.5			
Operating Air Pressure (For Air Blow)	MPa 0.4 ~ 0.5			
Operating Temperature	°C 0 ~ 70			
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32			
Mass ^{※8}	kg 0.3 0.4 0.8 1.3			

Notes ※7. P indicates the hydraulic pressure (MPa).

※8. The specifications show one unit.

※9. The maximum load weight indicates the case where four clamps are used and the pallet is in horizontal position (leveled).

The release hydraulic 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).)

In case the pallet is in vertical position (hanging on the wall), refer to P.771.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	VT0040-M□-A	VT0060-M□-A	VT0100-M□-A	VT0160-M□-A
A	49	53.5	60.5	68.5
D	30 ^{+0.027} _{+0.011}	36 ^{+0.027} _{+0.011}	46 ^{+0.027} _{+0.011}	56m6 ^{+0.030} _{+0.011}
E	13	17	18	19
F	12	12.5	14	18
G	22	22	26.5	29.5
H	29	35	45	55
K	29	33	42	50
L	56.5	66	78	88
Mx	21.5	25.5	30	34.5
My	8	9	11	12
N	2.6	3	3 ~ 3.3	3 ~ 3.3
P	32	35.5	44	51
Q ^{※1}	25	28.5	36	42
R ^{※2}	22.5	26	32.3	38.3
S	18	20	26	32
T	8	10	12	15
U	10	15	20	25
V	24	30	38.5	48
Y	9	9	8.5	13.5
AA	30	36	46	56
AB	29.5	35.5	45.5	55.5
AC	8	8	10	10
AD	14	18	19	20
AE ^{※5}	20	25	25	30
AF	6	10	15	20
AG ^{※5}	3.5	3.5	2	5
AH	10	15	20	25
AJ (Nominal×Pitch×Depth)	M5×0.8×10	M5×0.8×10	M6×1×10	M8×1.25×15
O-ring BA	AS568-023 (90°)	AS568-027 (90°)	AS568-030 (90°)	AS568-033 (90°)
O-ring BB	AS568-007 (90°)	1BP5	1BP5	1BP5
Mounting Bolt	M5×0.8×14	M5×0.8×14	M6×1×14	M8×1.25×20
Hole for Jack Bolt	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

Hole Clamp

SFA

SFC

Swing Clamp

LHA

LHC

LHS

LHW

LT/LG

TLA-2

TLB-2

TLA-1

Link Clamp

LKA

LKC

LKW

LM/LJ

TMA-2

TMA-1

Work Support

LD

LC

TNC

TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL

LLR

LLU

DP

DR

DS

DT

Block Cylinder

DBA

DBC

Control Valve

BZL

BZT

BZX/JZG

Pallet Clamp

VS

VT

Expansion Locating Pin

VL

VM

VJ

VK

Pull Stud Clamp

FP

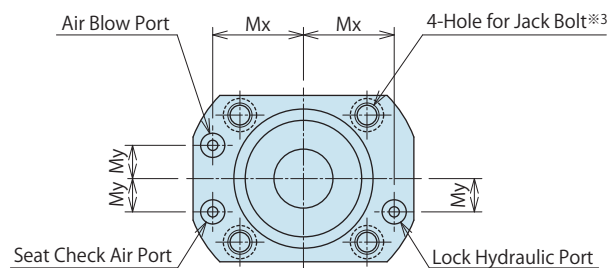
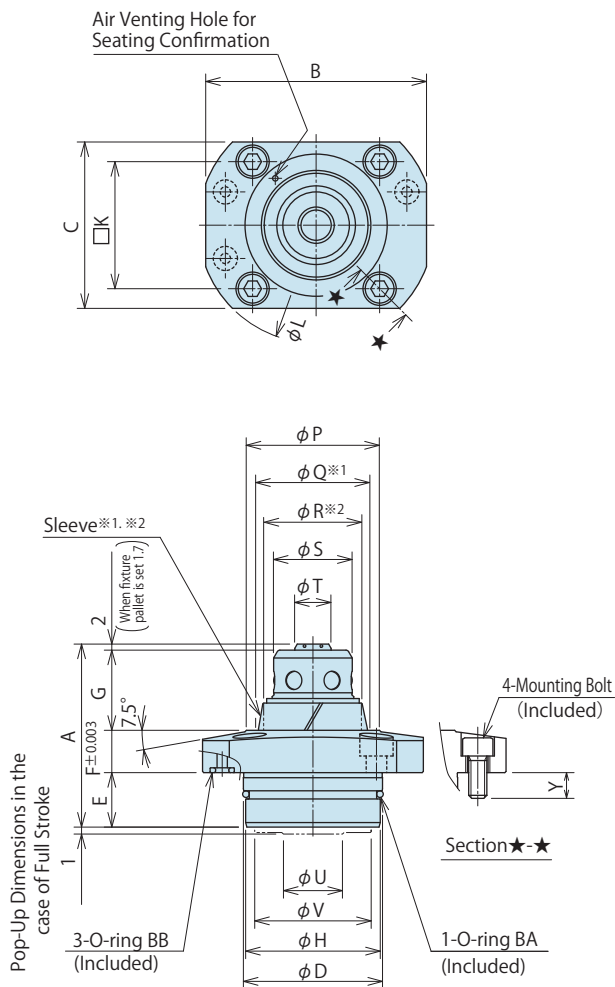
FQ

Customized Spring Cylinder

DWA/DWB

External Dimensions

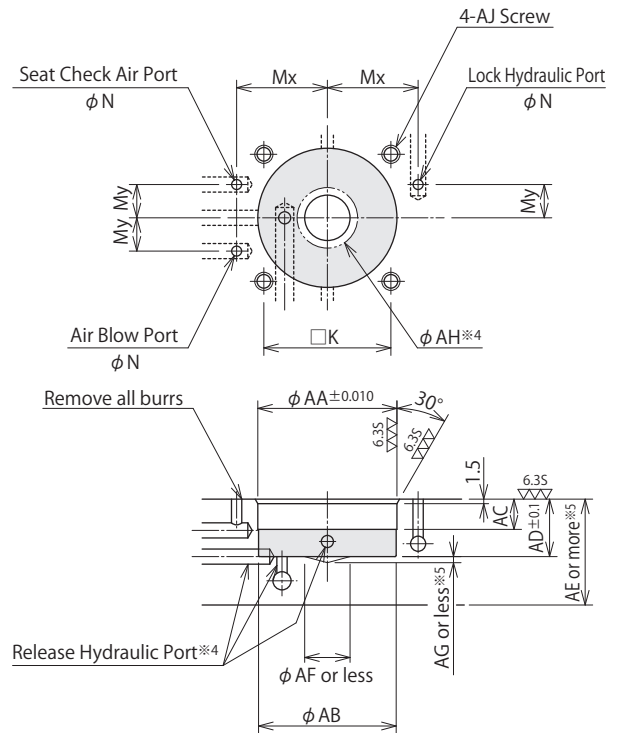
※This drawing shows the released state of VT-B.
(When supplying release hydraulic pressure)



Notes

- ※1. ϕQ shows the dimensions of sleeve (taper) of datum clamp (VS-MD).
- ※2. ϕR shows the dimensions of sleeve (straight) of guide clamp (VS-MG).
- ※3. The screw for jack is used when the clamp is removed.
(See P.772 for operation method)

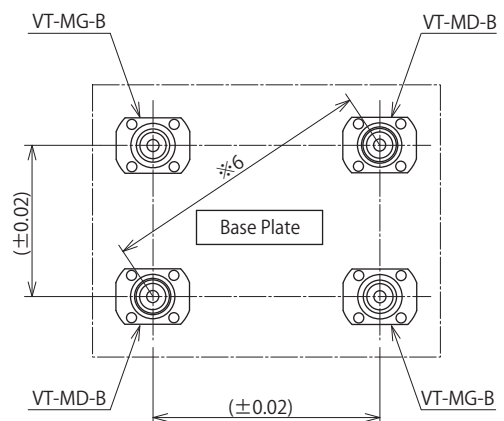
Machining Dimensions of Mounting Area



Notes

- 1. There should be no burrs at the intersection of processed hole.
- ※4. The release hydraulic port is within $\square K$ range.
- ※5. The base thickness (AG) and remaining depth after boring (AE) are reference values when the base material is S50C.

Distance Accuracy of Each Clamp



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 No.	VT0040-M□-B	VT0060-M□-B	VT0100-M□-B	VT0160-M□-B
Locating Repeatability	mm 0.003			
Clamping Force (Calculation Formula) ※7 ※8 kN	0.57×P	0.89×P	1.42×P	2.28×P
Lift Up Force (Calculation Formula) ※7 ※8 kN	0.36×P	0.57×P	0.93×P	1.45×P
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 1.5 1.5 2.0 2.0			
Max. Loading Weight ※9	kg 500 800 1200 1600			
Cylinder Capacity ※8 cm ³	Lock	1.1	1.9	3.5
	Release	1.5	2.4	4.7
Max. Operating Pressure	MPa 7.0			
Min. Operating Pressure	MPa 1.5			
Withstanding Pressure	MPa 10.5			
Operating Air Pressure (For Air Blow)	MPa 0.4 ~ 0.5			
Operating Temperature	°C 0 ~ 70			
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32			
Mass ※8	kg 0.3 0.4 0.8 1.3			

Notes ※7. P indicates the hydraulic pressure (MPa).

※8. The specifications show one unit.

※9. The maximum load weight indicates the case where four clamps are used and the pallet is in horizontal position (leveled).

The release hydraulic 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).)

When the pallet is in vertical position, please refer to P.771.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	VT0040-M□-B	VT0060-M□-B	VT0100-M□-B	VT0160-M□-B
A	49	53.5	60.5	68.5
B	53	62	73	82
C	40	44	55	67
D	30 ^{+0.027} / _{+0.011}	36 ^{+0.027} / _{+0.011}	46 ^{+0.027} / _{+0.011}	56m6 ^{+0.030} / _{+0.011}
E	13	17	18	19
F	12	12.5	14	18
G	22	22	26.5	29.5
H	29	35	45	55
K	29	33	42	50
L	56.5	66	78	88
Mx	21.5	25.5	30	34.5
My	8	9	11	12
N	2.6	3	3 ~ 3.3	3 ~ 3.3
P	32	35.5	44	51
Q ※1	25	28.5	36	42
R ※2	22.5	26	32.3	38.3
S	18	20	26	32
T	8	10	12	15
U	10	15	20	25
V	24	30	38.5	48
Y	9	9	8.5	13.5
AA	30	36	46	56
AB	29.5	35.5	45.5	55.5
AC	8	8	10	10
AD	14	18	19	20
AE ※5	20	25	25	30
AF	6	10	15	20
AG ※5	3.5	3.5	2	5
AH	10	15	20	25
AJ (Nominal×Pitch×Depth)	M5×0.8×10	M5×0.8×10	M6×1×10	M8×1.25×15
O-ring BA	AS568-023 (90°)	AS568-027 (90°)	AS568-030 (90°)	AS568-033 (90°)
O-ring BB	AS568-007 (90°)	1BP5	1BP5	1BP5
Mounting Bolt	M5×0.8×14	M5×0.8×14	M6×1×14	M8×1.25×20
Hole for Jack Bolt	M6×1	M6×1	M8×1.25	M10×1.5

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support

LD
LC
TNC
TCAir Sensing
Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

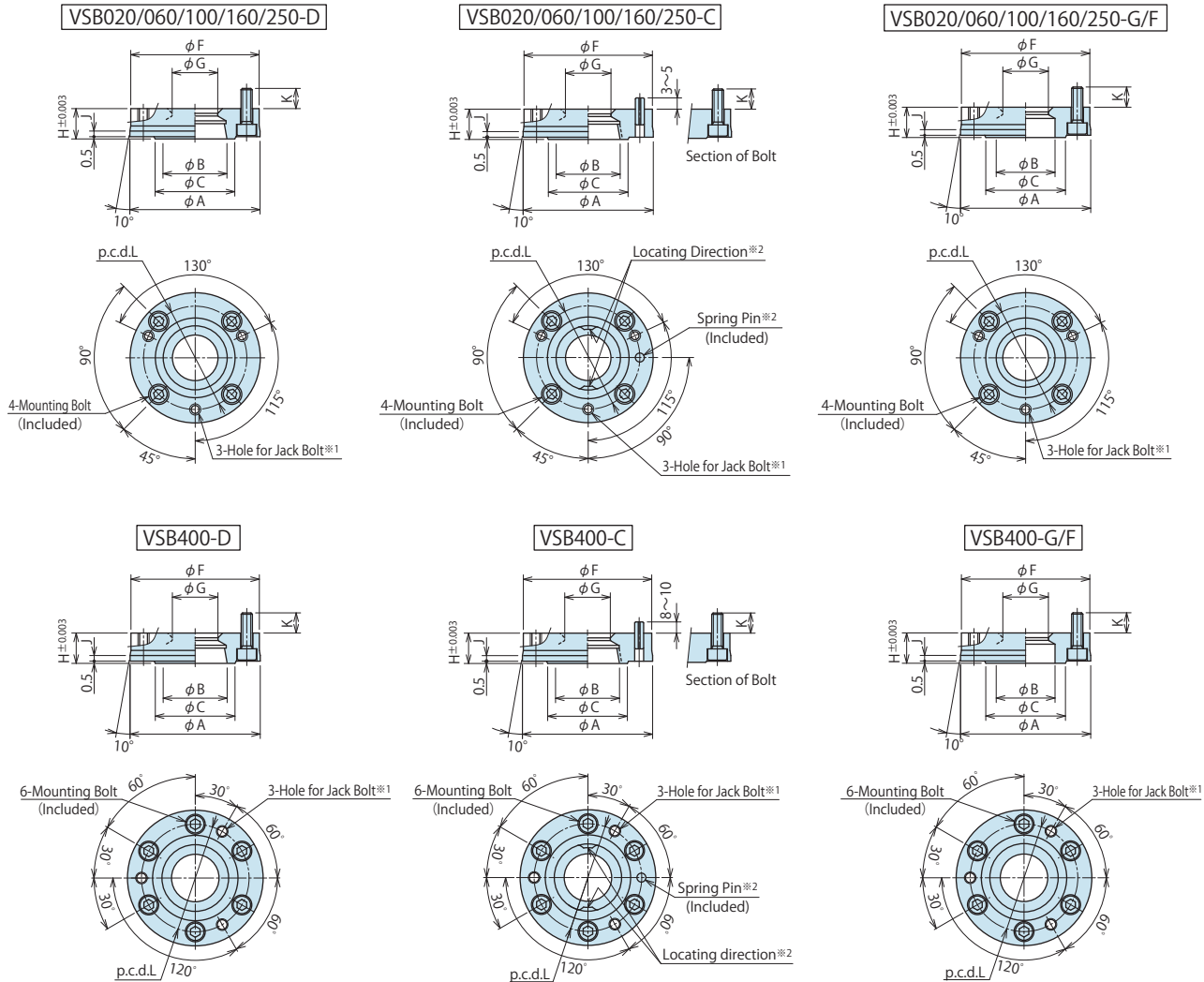
VS
VTExpansion
Locating PinVL
VM
VJ
VK

Pull Stud Clamp

FP
FQCustomized
Spring Cylinder

DWA/DWB

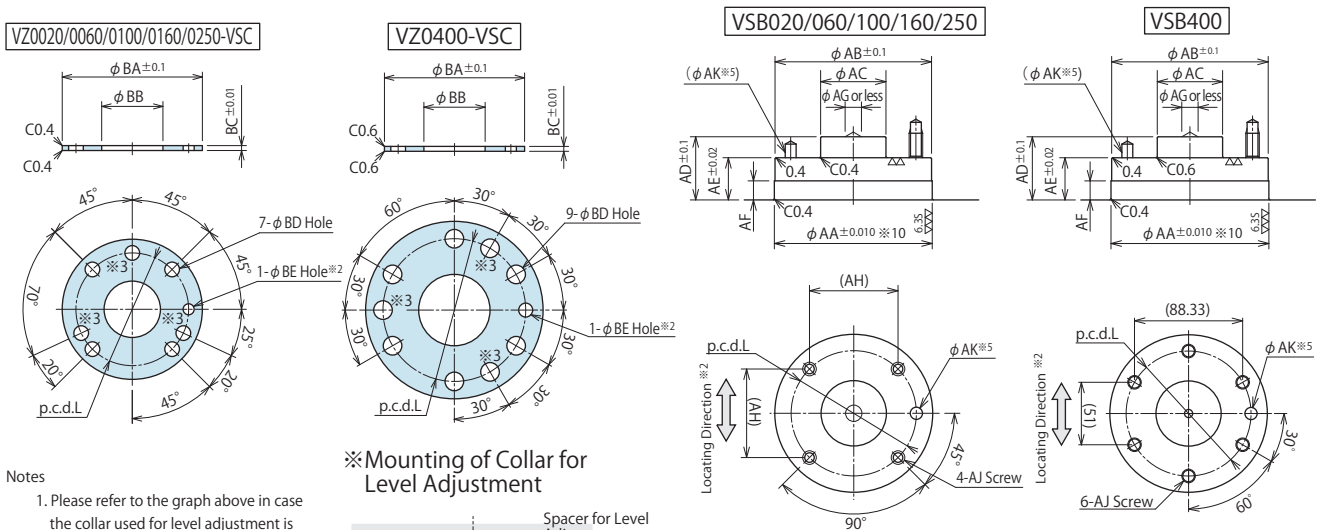
External Dimensions



- Notes
- ※1. The screw for jack is used when the clamp is removed.
 - ※2. The spring pin is used for phasing of VSB-C positioning direction.

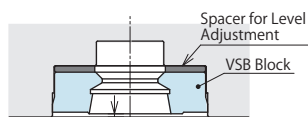
Dimensions of Collar for Level Adjustment

Machining Dimensions of Mounting Area



- Notes
- 1. Please refer to the graph above in case the collar used for level adjustment is prepared by company.
 - ※3. (Three positions) are used for jack screws. Match the phase of screw used for jack of VSB block.

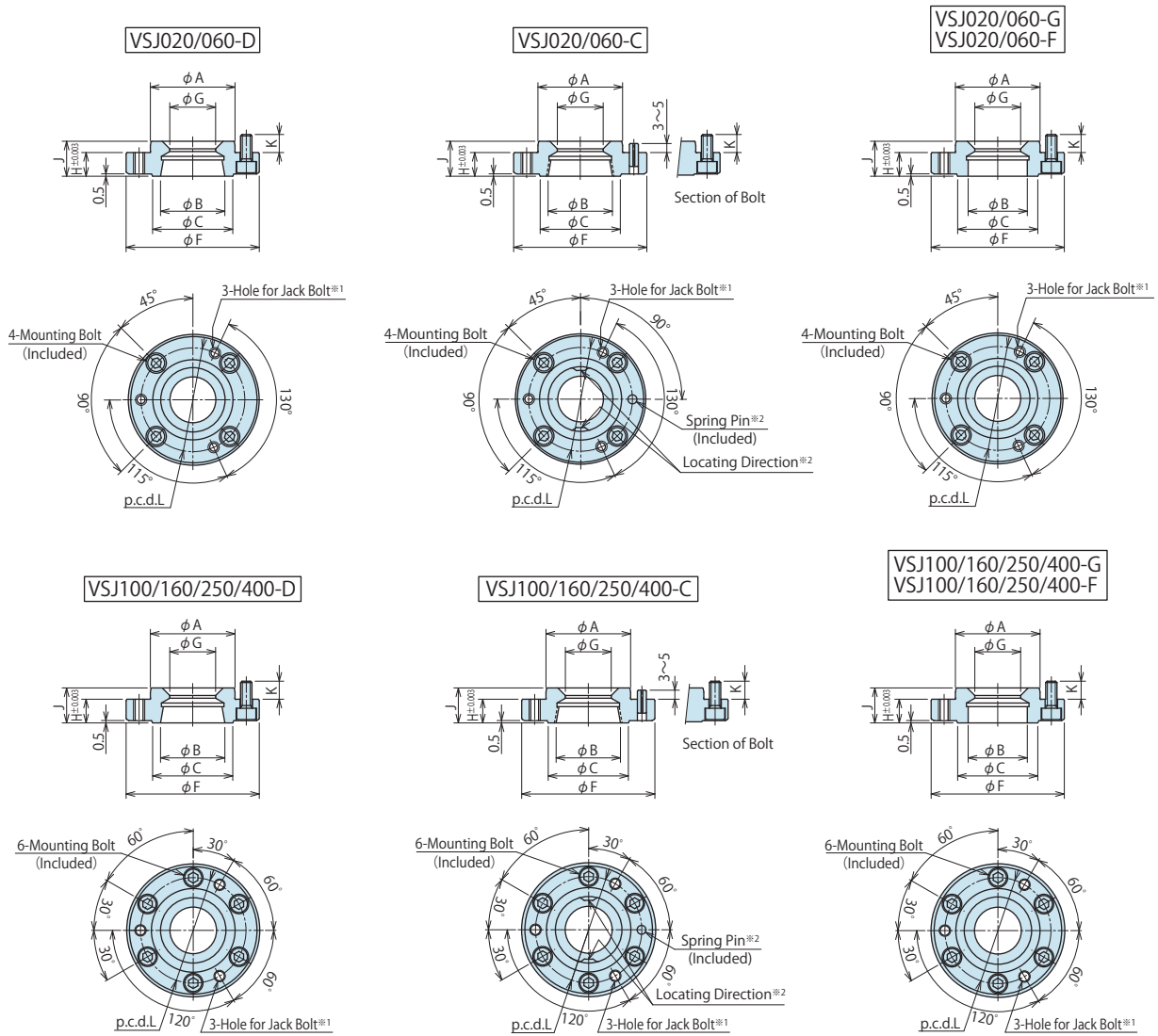
Mounting of Collar for Level Adjustment



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

- Notes
- 1. This graph shows a 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. ϕAK hole is used for phasing of VSB-C positioning direction. Please make sure ϕAK hole is at the line connecting the centers of VSB-D and VSB-C. This processing is only necessary for VSB-C.

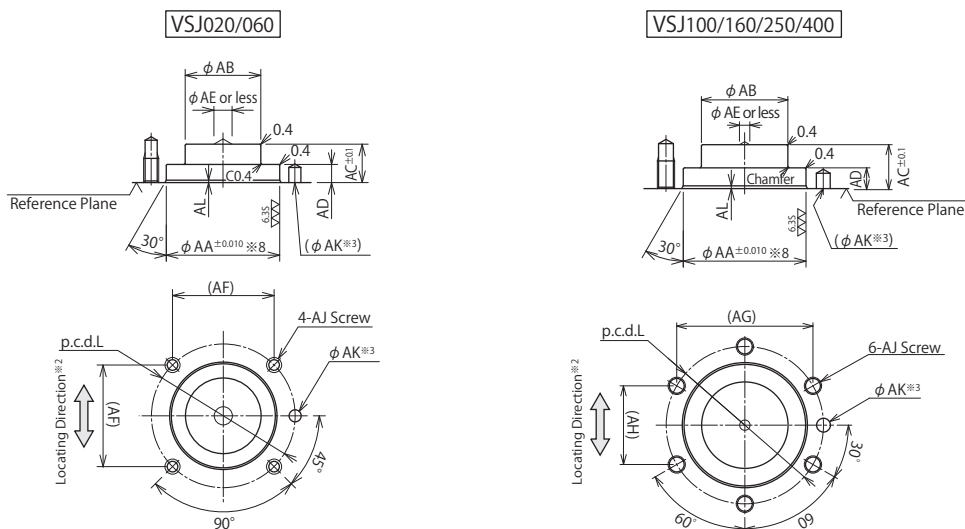
External Dimensions



Notes

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

Machining Dimensions of Mounting Area



Notes

- ※3. φ AK hole is used for phasing of VSJ-C positioning direction.
Please make sure is φ AK hole is at the line connecting the centers of VSJ-D and VSJ-C.
This process is only required for the VSJ-C.

Introduction of Related Products

Pump Unit

model CV

→ P.983



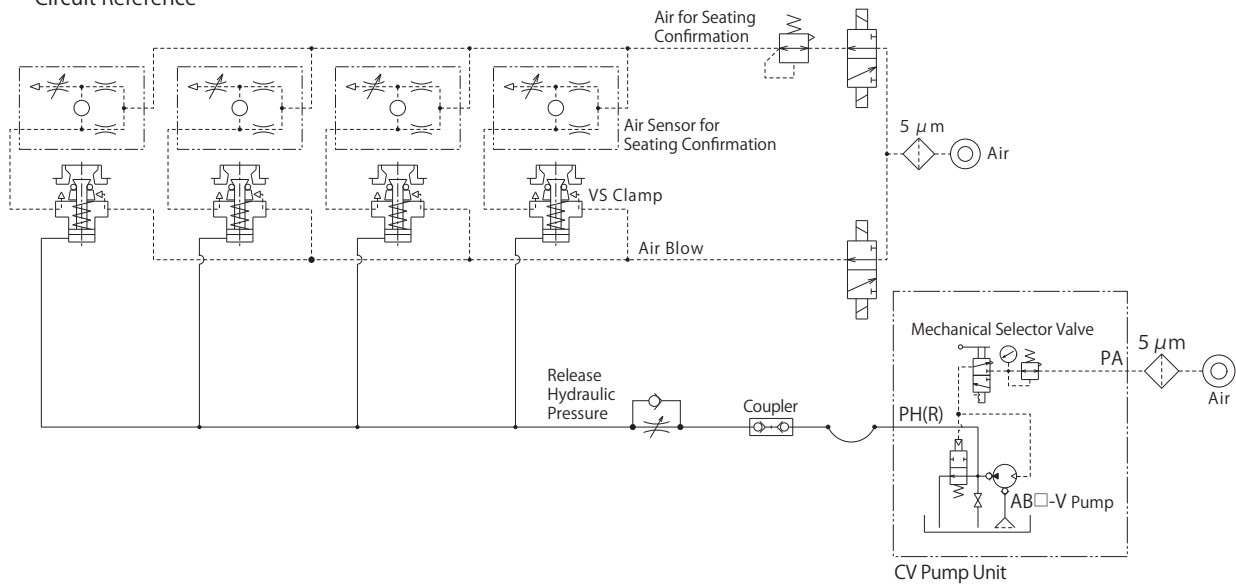
A compact shop air-driven hydraulic pump.
 The circuit is controlled with air ON/OFF (hydraulic pressure ON/OFF).
 Easy to set up with compact size.

Please take a look at P.983 for Specification details.

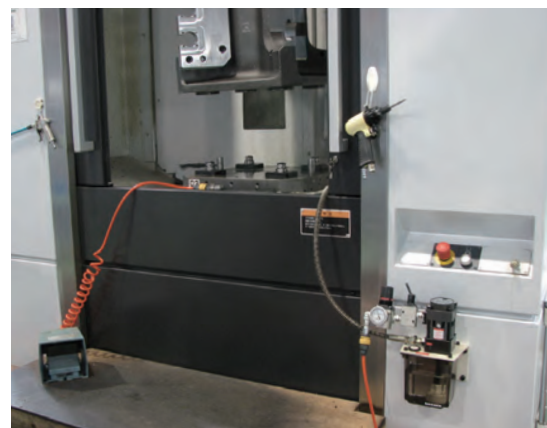
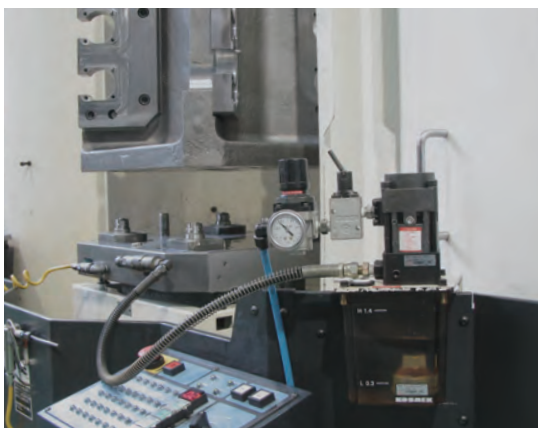
Model	CV2B30-0-□□	CV2B40-0-□□	CV2B50-0-□□
Pump Model No.	AB3000-V□	AB4000-V□	AB5000-V□
Discharge Hydraulic Pressure ※1 MPa	2.4~4.3	3.9~7.0	6.0~11.0
Air Consumption Nm ³ /min	0.4		
Tank Capacity ℓ	2 ℓ (Actual Amount for Use 1.1 ℓ)		
Operating Temperature °C	0 ~ 70		
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32		

Notes ※1. Discharge pressure is set when air pressure range is between 0.3~0.5MPa.
 1. Please see AB/AC pump performance curve for discharged oil volume(P.1003).

Circuit Reference



Reference Images for Use



High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

SFA

SFC

Swing Clamp

LHA

LHC

LHS

LHW

LT/LG

TLA-2

TLB-2

TLA-1

Link Clamp

LKA

LKC

LKW

LM/LJ

TMA-2

TMA-1

Work Support

LD

LC

TNC

TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL

LLR

LLU

DP

DR

DS

DT

Block Cylinder

DBA

DBC

Control Valve

BZL

BZT

BZX/JZG

Pallet Clamp

VS

VT

Expansion Locating Pin

VL

VM

VJ

VK

Pull Stud Clamp

FP

FQ

Customized Spring Cylinder

DWA/DWB

Non-Leak Coupler (Hydraulic Pressure)

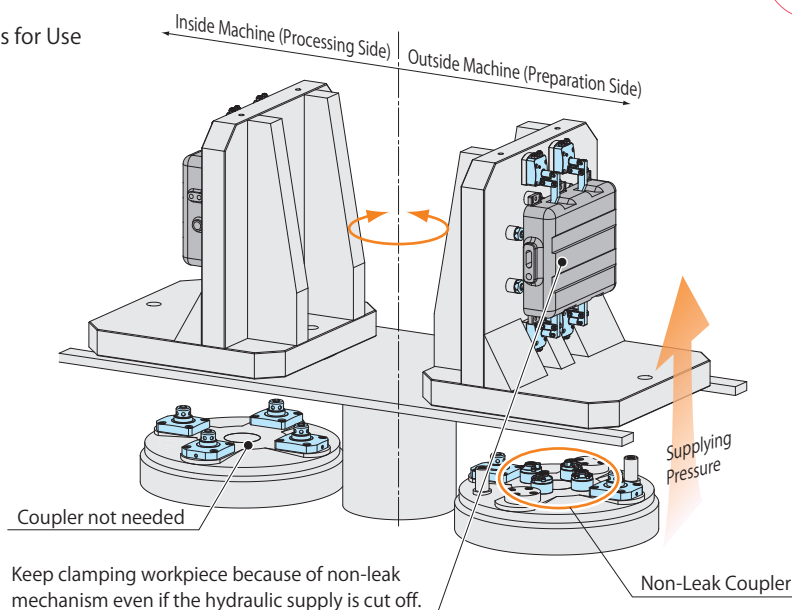
model **BGC/BGD**

→ P.837

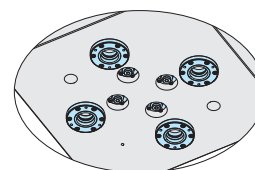
Even if the coupler is separated after adding pressure and supplying fluid, it can hold the pressure of the coupler at the side that receive fluid supply from the other.
You can cut off unwanted circuit facilities and hydraulic pressure is allowed to be off even when the coupler is separated.



Images for Use



The Bottom Surface of Pallet



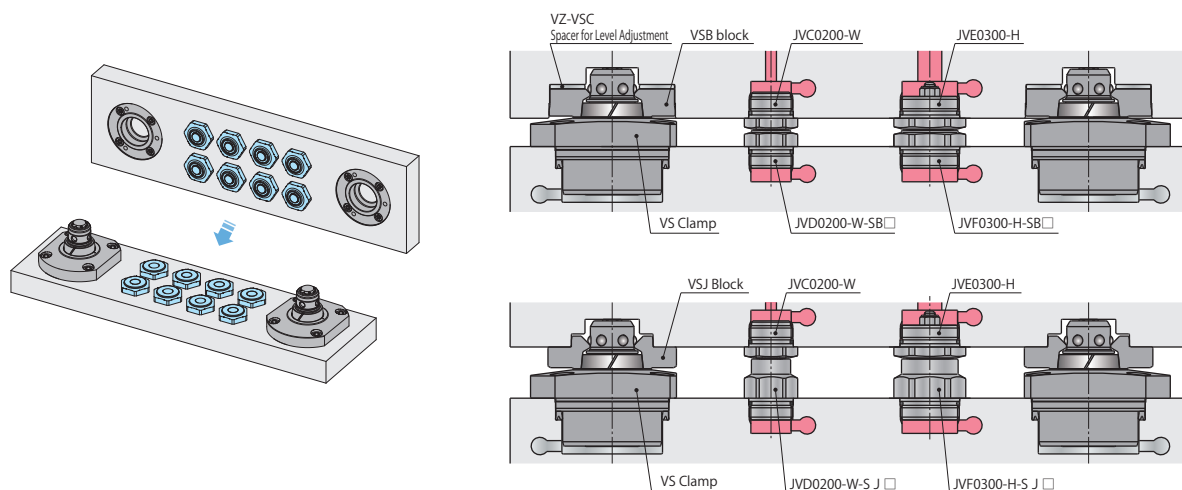
Auto Coupler (Hydraulic Pressure / Air / Coolant) model **JVC/JVD、JVE/JVF**

→ P.867~P.874

This coupler whose connection stroke is so short makes the automation real.
This coupler that is designed in a small size is able to be set up in a small spaces.



Images for Use



Cautions

Notes for Design

1) Check Specifications

- Please use each product according to the specifications.

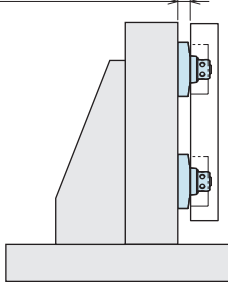
2) Notes for Circuit Design

- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P. 1044 to assist with proper hydraulic circuit designing. Improper circuit design will lead to applications malfunction and damages.
- It is recommended to use the air flow path over $\phi 6$ mm.

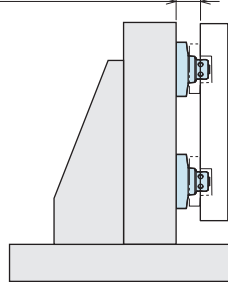
3) When the pallet is in vertical position.

- 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.

When VSB block is used
Allowed Dimension P



When VSJ block is used
Allowed Dimension P



Allowed Dimension P (VS Spring Clamp) (mm)

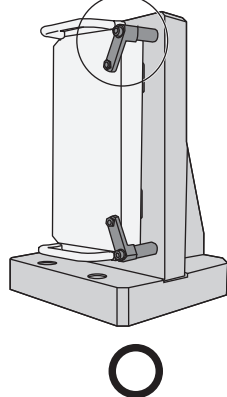
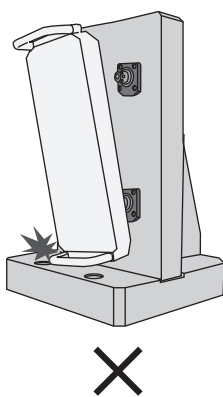
Model No.	VS0020	VS0040	VS0060	VS0100	VS0160	VS0250	VS0400
VSB block	13	13	14.5	17	21	27	33
VSJ block	21.5	21.5	25	27.5	33.5	42.5	51.5

Allowed Dimension P (VT Hydraulic Clamp) (mm)

Model No.	VT0040	VT0060	VT0100	VT0160
VSB Block	13	13.5	15	19
VSJ Block	21.5	24	25.5	31.5

- 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.

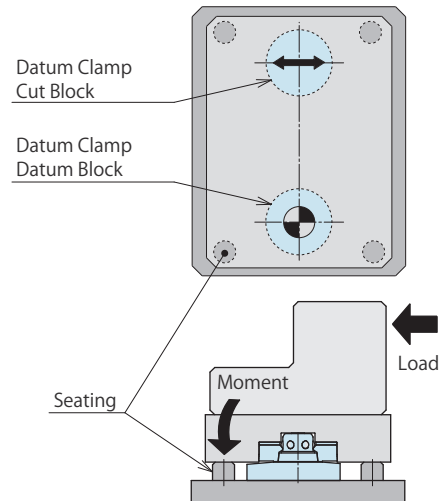
Example of Latching Mechanism



- 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.

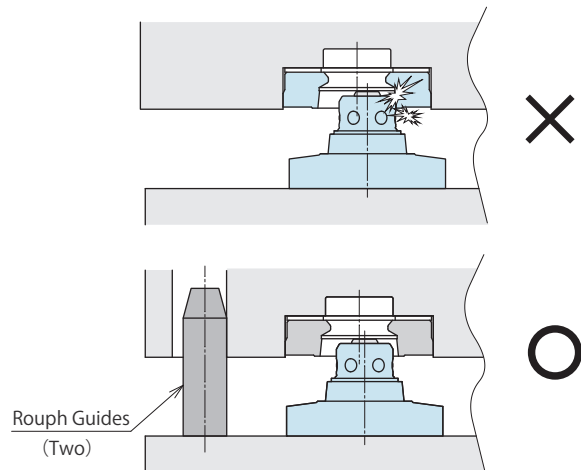
4) Seat Setting

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

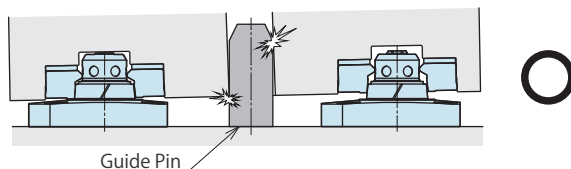
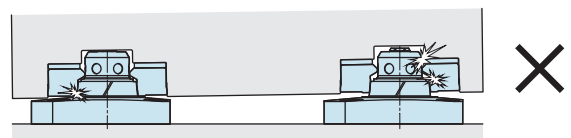


5) Setting of Rough Guide

- 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.



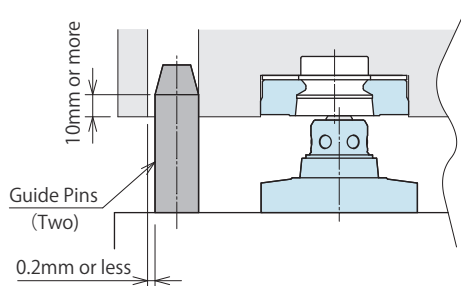
- The pallet must be level when lowering or lifting from the pallet clamps. If necessary, provide guide pins to keep the pallet level during loading and unloading.



- 6) It is necessary to have a guide in case the guide block (VSB/VSJ-G) is not used.
- The combination of guide clamp (WVT-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.



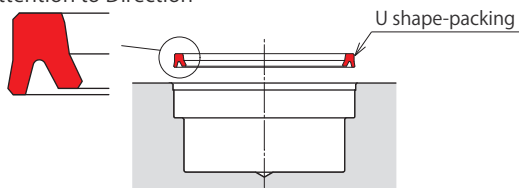
● Installation Notes

- 1) Check the Usable Fluid
 - Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1043).
- 2) Mounting the body
 - Use four bolts with hex. hole (grade 12.9) and tighten the body with torque as shown in the table below.
 - Tighten them evenly to prevent twisting or jamming.

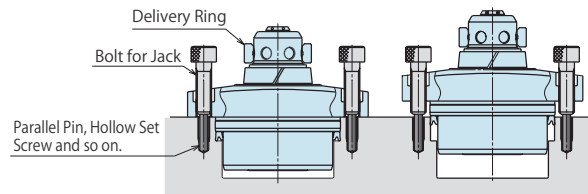
Clamp Model		Block Model		Thread size	Tightening Torque (N·m)
VS	VT	VSB	VSJ		
-	-	VSB020	VSJ020	M4×0.7	3.2
VS0020	VT0040	VSB060	VSJ060	M5×0.8	6.3
VS0040	VT0060	VSB100	VSJ100		
VS0060	VT0100	VSB160	VSJ160	M6×1	10
VS0100	VT0160	VSB250	VSJ250	M8×1.25	25
VS0160	-	VSB400	VSJ400	M10×1.5	50
VS0250	-	-	-	M12×1.75	80
VS0400	-	-	-	M16×2	200

- Please set up the U shape-packing to the mounting hole as it is like the picture below.

Attention to Direction

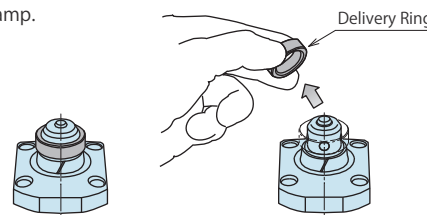


- 3) Removal (Only VS Clamp)
 - Mount the delivery ring.
 - Remove mounting bolts. Insert jack bolts and tighten evenly to lift clamp.
 - Protect the screw parts with parallel pins as shown in the graph below in order for the bolts used for jack not to damage the surface of mounting screws.

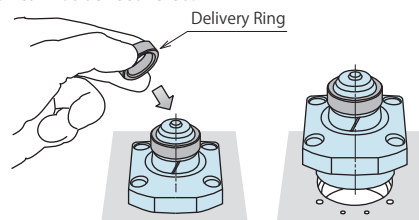


4) Delivery Ring [Important] (Only VS clamp)

- 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 hydraulic pressure.)
- Please take good care of the delivery ring as it is necessary to remove the clamp.

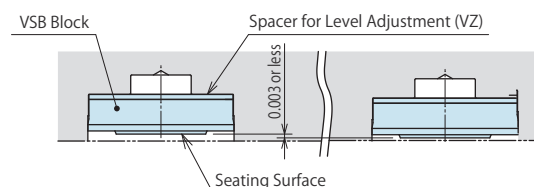


- When the pallet clamp is removed from the fixture, mount the delivery ring in advance. In case it is removed without using of the delivery ring, the internal parts may be separated from the spring, which cannot be recovered.



5) Level adjustment of VSB 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.1043 for common cautions.

• Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
• Notes on Handling • Maintenance/Inspection • Warranty

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

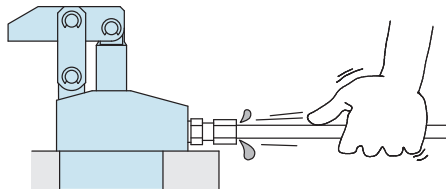
Customized Spring Cylinder

DWA/DWB

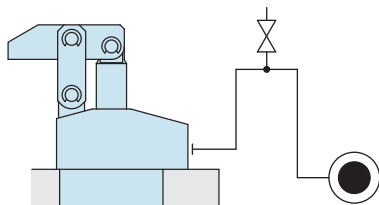
● Cautions

● Installation Notes (For Hydraulic Series)

- 1) Check the Usable Fluid
 - Please use the appropriate fluid by referring to the Hydraulic Fluid List.
- 2) Procedure before Piping
 - The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
 - The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
 - There is no filter provided with Kosmek' s product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.
- 3) Applying Sealing Tape
 - Wrap with tape 1 to 2 times following the screw direction.
 - Pieces of the sealing tape can lead to oil leakage and malfunction.
 - In order to prevent a foreign substance from going into the product during the piping work, it should be carefully cleaned before working.
- 4) Air Bleeding of the Hydraulic Circuit
 - If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.
 - ① Reduce hydraulic pressure to less than 2MPa.
 - ② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
 - ③ Wiggle the pipeline to loosen the outlet of pipe fitting.
Hydraulic fluid mixed with air comes out.



- ④ Tighten the cap nut after bleeding.
- ⑤ It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit.
(Set an air bleeding valve at the highest point inside the circuit.)



5) Checking Looseness and Retightening

- At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

● Hydraulic Fluid List

Maker	ISO Viscosity Grade ISO-VG-32	
	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New Mighty Super 32
ExxonMobil	Mobil DTE 24	Mobil DTE 24 Light
Matsumura Oil	Hydol AW-32	
Castrol	Hyspin AWS 32	

Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

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

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

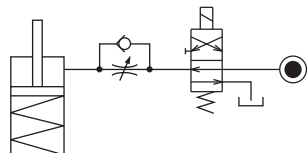
● Notes on Hydraulic Cylinder Speed Control Unit



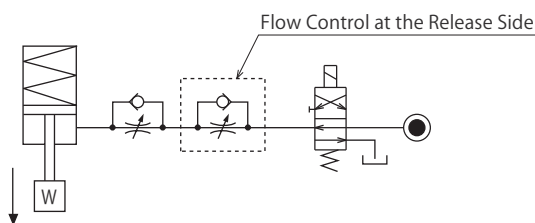
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

● Flow Control Circuit for Single Acting Cylinder

For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.



Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



● Flow Control Circuit for Double Acting Cylinder

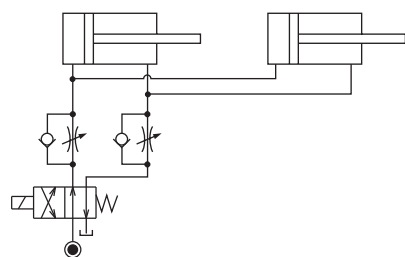
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.

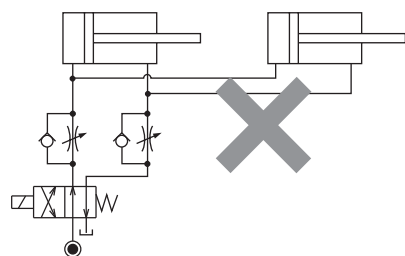
Refer to P.47 for speed adjustment of LKE.

For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

【Meter-out Circuit】 (Except LKE/TMA/TLA)

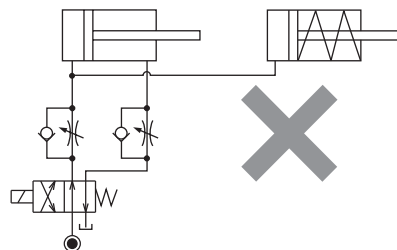


【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



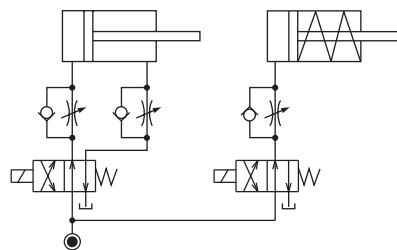
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- ① Single acting components should not be used in the same flow control circuit as the double acting components. The release action of the single acting cylinders may become erratic or very slow.

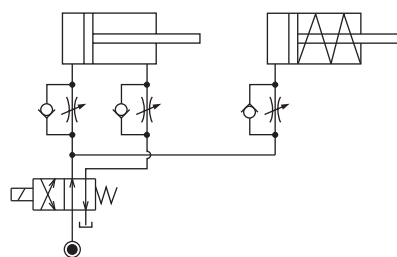


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

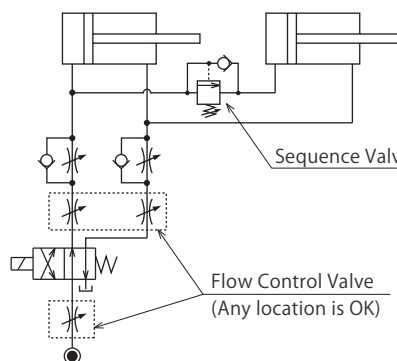
- Separate the control circuit.



- Reduce the influence of double acting cylinder control unit. However, due to the back pressure in tank line, single action cylinder is activated after double action cylinder works.



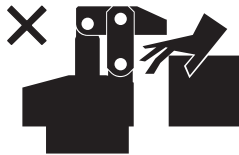
- ② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection. If the back pressure is more than the set pressure then the system will not work as it is designed to.



● Cautions

● Notes on Handling

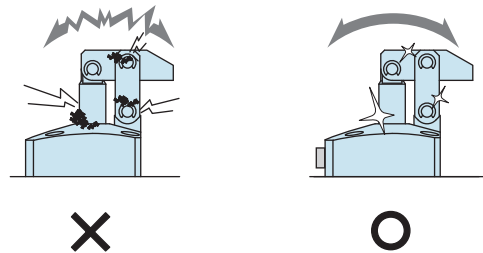
- 1) It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when 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.



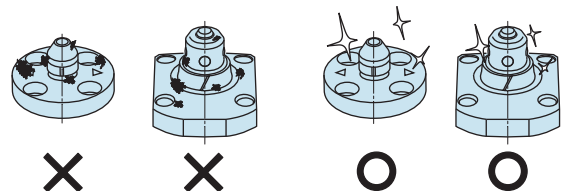
- 4) Do not disassemble or modify.
 - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● 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.

● 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

Sales Offices across the World

Japan	TEL. +81-78-991-5162	FAX. +81-78-991-8787
Overseas Sales	KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241 〒651-2241 兵庫県神戸市西区室谷2丁目1番5号	
USA	TEL. +1-630-241-3465	FAX. +1-630-241-3834
KOSMEK (USA) LTD.	1441 Branding Avenue, Suite 110, Downers Grove, IL 60515 USA	
China	TEL.+86-21-54253000	FAX.+86-21-54253709
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