Pneumatic Location Clamp

Model **SWT**

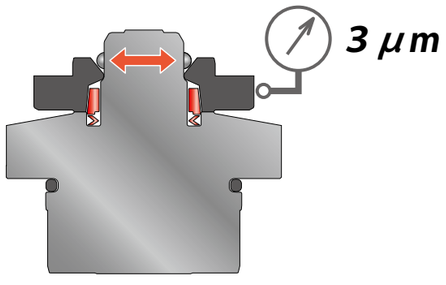
Locates and clamps simultaneously.

Locating Repeatability：3μm　All Stainless Steel

PAT.

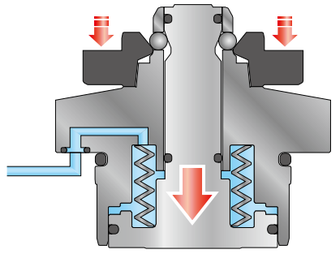
● Repetitive Locating with High Accuracy

Locating Repeatability： 3 μm
Used with a combination of the clamp and block.
Mount the block on the object for locating.



● Clamping Function

Clamping force is ranged from 0.7kN ～ 9.0kN.
Clamps with air pressure and spring for self locking.
Clamping force is selectable for your needs.

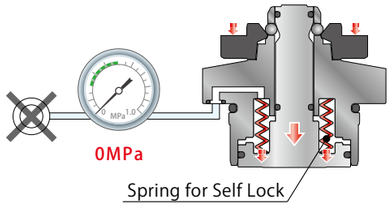


● Self Lock (Safety) Function （Holding Force at zero pneumatic pressure）

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

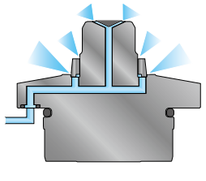
※ For locating more than the minimum operating air pressure is required.

Maintains clamped state.

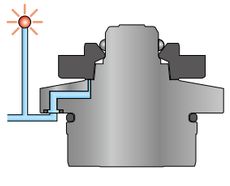


● Air Blow and Seat Check

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



Air Blow

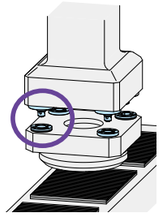


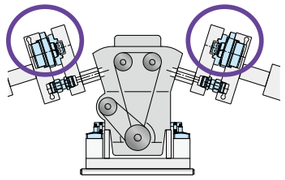
Seat Check

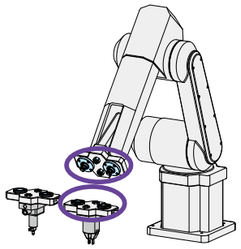
Advantages

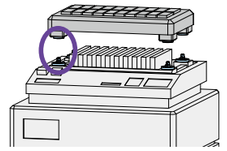
● Setup improvement enhances productivity.

Pneumatic locating clamp locates with high accuracy and clamps simultaneously. (Fixture alignment and inspection are eliminated.) Fixture change over is faster and easier, thus by eliminating alignment inspection for accuracy which is done in many different ways.


＜Production Line of LCD Panels＞

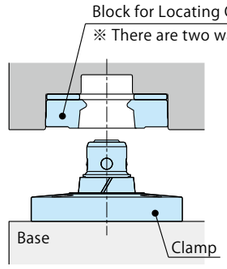

＜Engine Test Device＞


＜Robotic Tool Changers＞

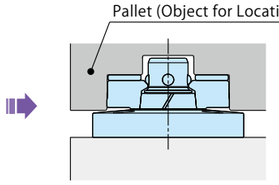

＜Semiconductor Inspection Device＞

Application Examples

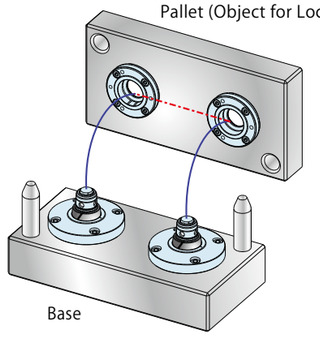
※ Refer to P.51 for detailed action description.

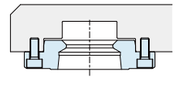
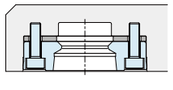


Released State



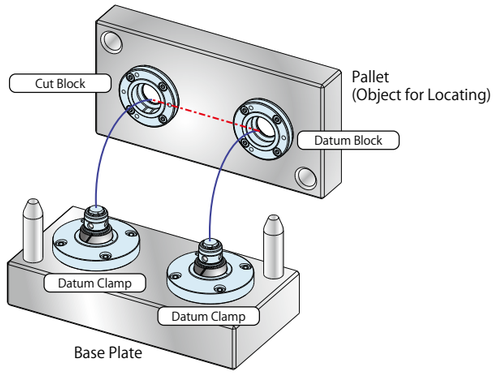
Locked State



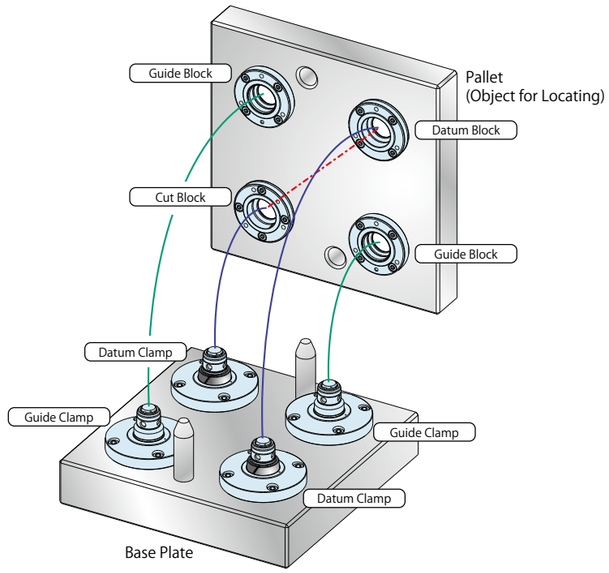
	 Model **SWT** → P.61	 Model **SWTJ** → P.65	 Model **SWTB** → P.63
Classification	**Double Action** Air Lock / Air Release	**Flange Shaped Block**	**Embedded Block**
Operating Pressure Range	0.35～1MPa	–	–
Features	・Clamping force varies according to air pressure. ・Self-Lock Function with Spring ・Material：Stainless	 ・Simple Mounting ・Material：Stainless	 ・Straight Mounting ・Material：Stainless
Accessories	–	–	Level Adjustment Collar (Only for SWTB) Material：Equal to S45C VZ-VSC → P.63

System References

Using Two Air Location Clamps



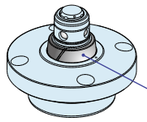
Using Four Air Location Clamps



Apparatus and Function

※ For the combination of clamps and blocks, please refer to the P.55.

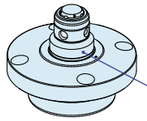
Datum Clamp



With Locating Function

Movable Taper Sleeve

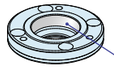
Guide Clamp



No Locating Function

Guide Part (Straight)

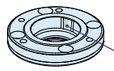
Datum Block



For Reference Plane Direction Locating

Taper Reference Surface (Whole Circumference)

Cut Block

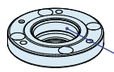


For One Direction Locating

Taper Reference Surface (a part)

※ In the case of installation, only cut block requires attention in phase. Please refer to the phase of SWT□-C (P.64/P.65) for detail.

Guide Block

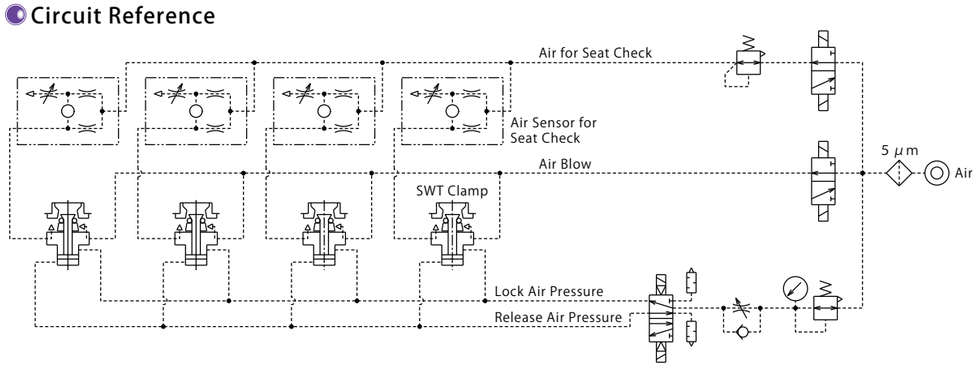


For Guide

Guide Part (Straight)

※ Free block does not have a guide function.

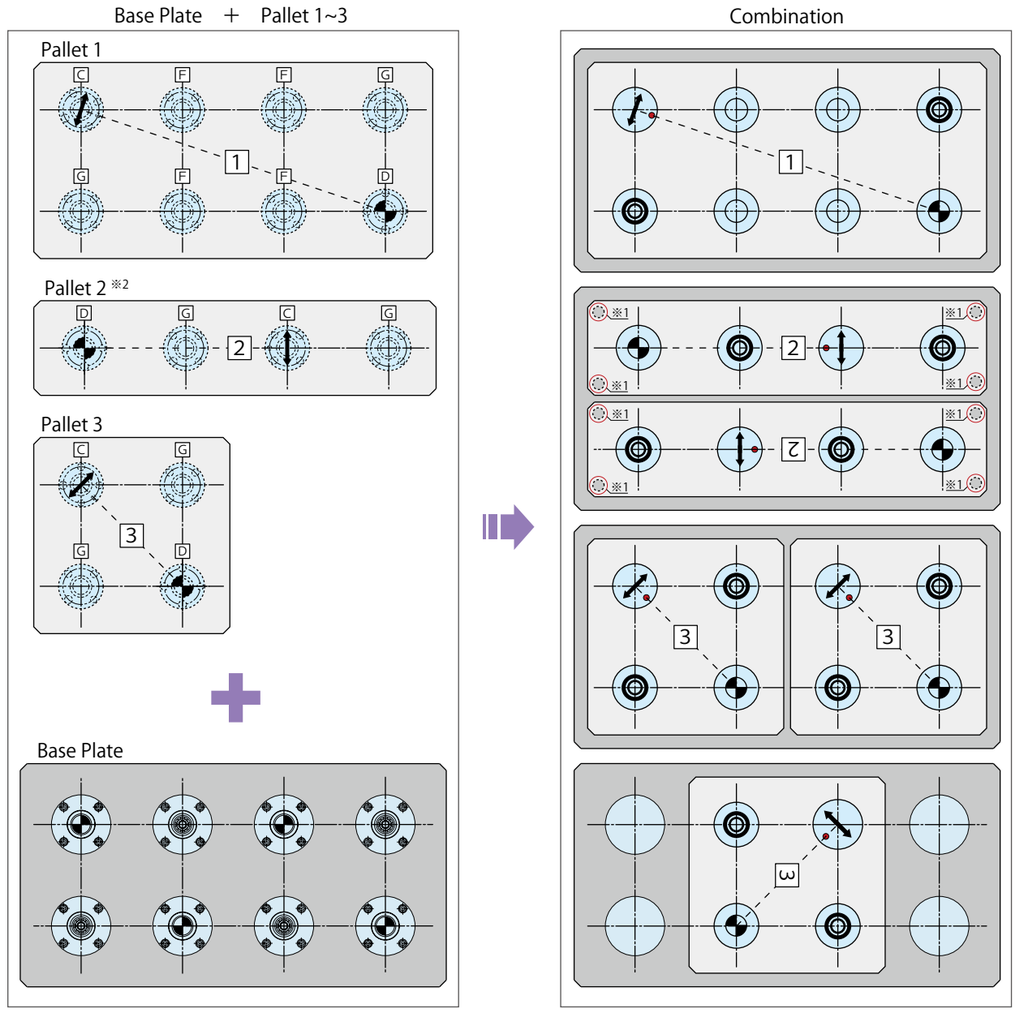
Circuit Reference



Note 1. It is recommended to use air blow line with at least φ6 in order to ensure effective air flow. Please supply clean filtered air.

Configuration Sample of Pallets with Different Sizes

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

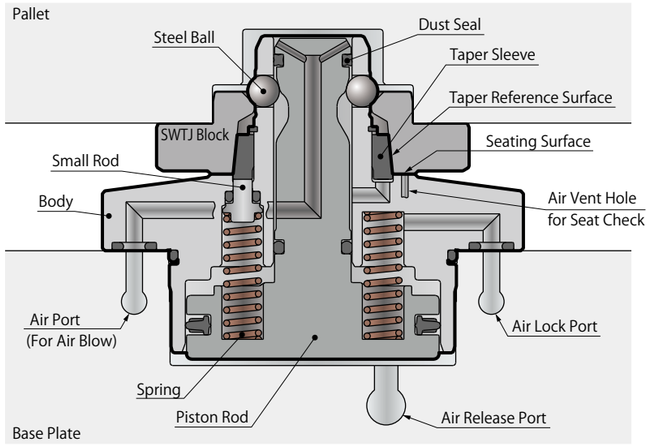
Clamp Installed on the Base Plate		Block Installed on the Pallet		Function when Combined
Datum Clamp	+	Datum Block	→	Clamping Function + Locating Function (Reference Point)
Datum Clamp	+	Cut Block ※2	→	Clamping Function + Locating Function (One Direction) ※2
Guide Clamp	+	Guide Block	→	Clamping Function + Guide Function
Datum Clamp or Guide Clamp	+	Free Block	→	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.)

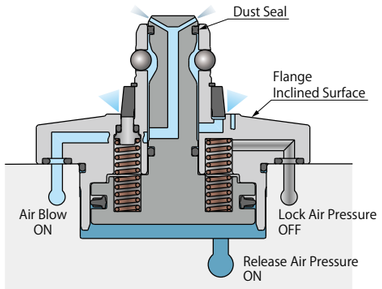
Cross Section



Material of the Product：SUS (Except for Packing, Shipping Ring, Level Adjustment Collar)

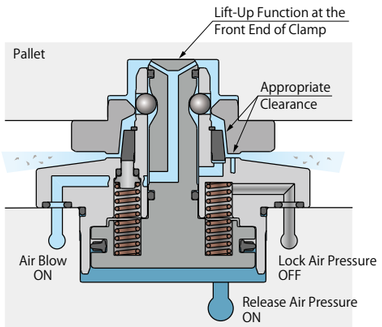
Action Description

Before Loading Pallet



- Air blow prevents debris contamination.
- Dust seal prevents foreign objects from entering and keeps steel ball area clean.
- The flange inclined surface allows foreign substances and fluid to flow easily.
- The slit of taper sleeve (one place) is protected with rubber plate to prevent invasion of cutting chips.

When Loading Pallet

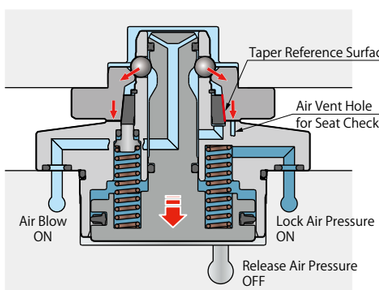


When loading the pallet,
- The pallet is set on the raised piston rod cap.

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 blow.

When unloading the pallet,
- The close contacting of taper seating surface is released with lift-up force.

When Clamping



- When release air pressure is OFF and lock air pressure is ON, the air pressure and 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 accuracy via the taper sleeve as it contacts the taper surface of the block.
- The seating surface includes an air vent for seat check (via air catch sensor).

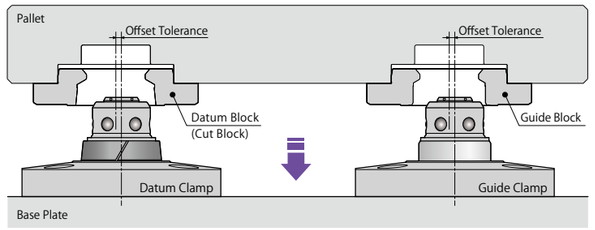
After Loading Pallet

When Unloading Pallet

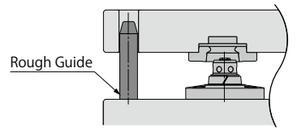
When Clamping

Action Description during Loading/Unloading

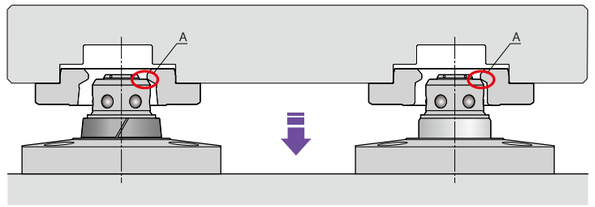
1. Air pressure releases the clamp. Position of pallet while loading must be kept within the offset tolerance.



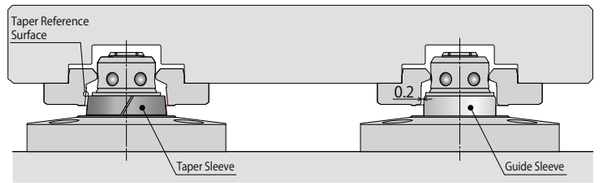
It is recommended to use rough guides to contain the pallet within the offset tolerance.



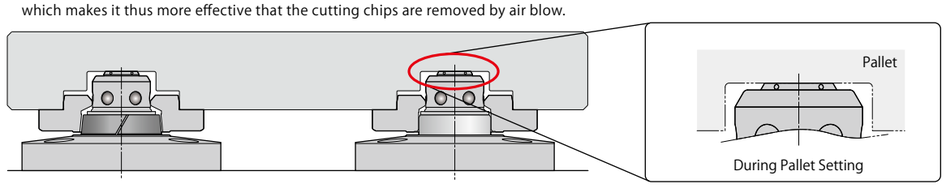
2. When the pallet is lowered, it should be positioned so the blocks contact the rod as shown on A.



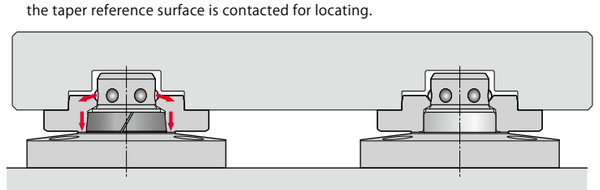
3. As the pallet is further lowered, it is positioned within 0.2mm of the reference axis via the guide sleeve and guide block. (Guide Function) Clearance between the datum clamp and taper reference surface created by guide function prevents interference.



4. Loading is finished when pallet is resting on piston rod. 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 blow.

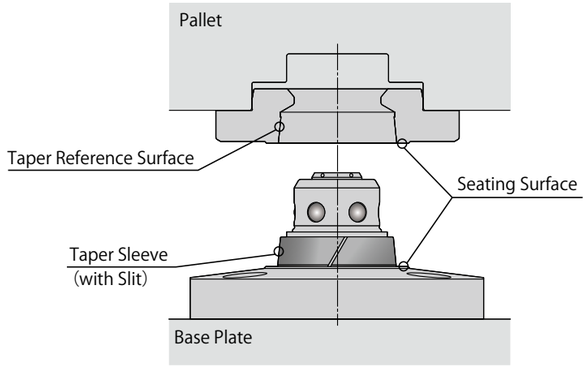


5. When release air pressure is OFF and lock air pressure is ON, the block is pressed on the seating surface with air pressure and spring force. When the block is pressed, the taper reference surface is contacted for locating.



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 movable taper sleeve, the clearance between the clamp, taper sleeve and block is eliminated enabling the repetitive location accuracy and stabilized clamping force.

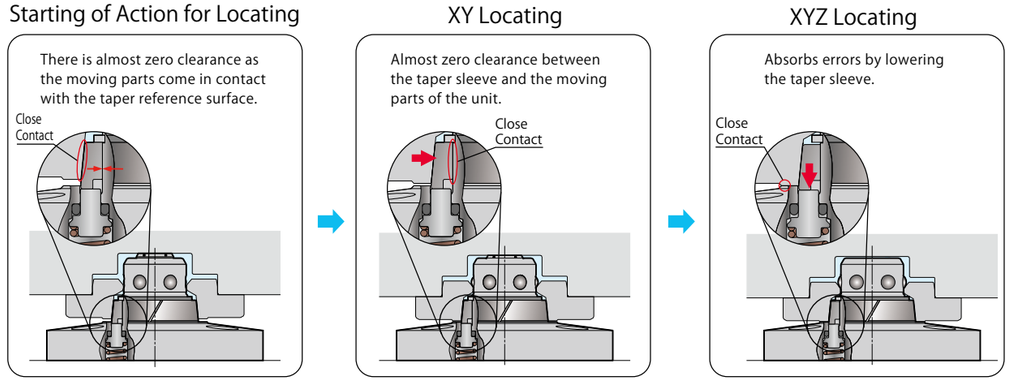
① Absorbs tolerance variations in each location clamp and block.

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.

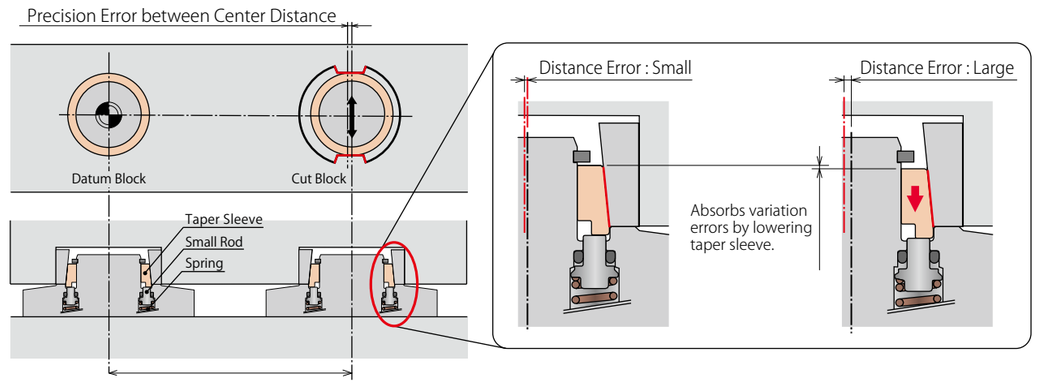
Movement and Error Absorbed by the Movable Taper Sleeve (①/②)



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.



Precision Error between Center Distance ±0.02 (max. ±0.025)

Model No. Indication (Clamp)

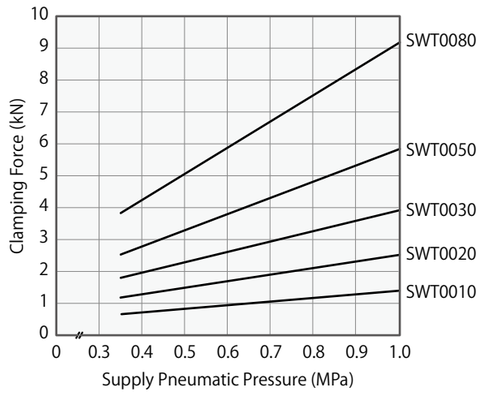
SWT 0 03 0 - M D

1 2 3

1 Clamping Force

01 : Clamping Force 0.8kN (Pneumatic Pressure 0.5MPa)
02 : Clamping Force 1.5kN (Pneumatic Pressure 0.5MPa)
03 : Clamping Force 2.3kN (Pneumatic Pressure 0.5MPa)
05 : Clamping Force 3.3kN (Pneumatic Pressure 0.5MPa)
08 : Clamping Force 5.1kN (Pneumatic Pressure 0.5MPa)

※ Refer to clamping force.
Refer to Performance Curve and Specification for detail.

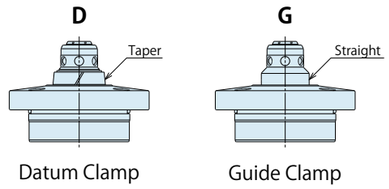


2 Design No.

0 : Revision Number

3 Functions

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



Datum Clamp　　Guide Clamp

Combination of Clamp and Block

Clamp Model No.	Block Model No.	Function
SWT-MD (Datum Clamp)	SWTB□-D / SWTJ□-D (Datum Block)	Clamping + Locating at a Reference Point
SWT-MD (Datum Clamp)	SWTB□-C / SWTJ□-C (Cut Block)	Clamping + One Direction Locating
SWT-MG (Guide Clamp)	SWTB□-G / SWTJ□-G (Guide Block)	Clamping + Guide
SWT-M□ (Datum / Guide Clamp)	SWTB□-F / SWTJ□-F (Free Block)	Clamping

Note
1. Please refer to the following "SWT-SWTB/SWTJ Block Compatible Lists" for the detailed form of the combination.

SWT－SWTB/SWTJ Block Compatible Lists

Clamp Model No.	SWT0010	SWT0020	SWT0030	SWT0050	SWT0080
SWT Block Model No. (Material：SUS)	SWTB010 SWTJ010	SWTB020 SWTJ020	SWTB030 SWTJ030	SWTB050 SWTJ050	SWTB080 SWTJ080
WVS Block Model No. (Material：SCM)	-	VSB020 VSJ020	VSB060 VSJ060	VSB100 VSJ100	VSB160 VSJ160

Note
1. Please refer to the above "Combination of Clamp and Block" for functions.

Model No. Indication (Block)

SWTB：Embedded Block

SWTB 03 0 - D

1 2 3 4

SWTJ：Flange Shaped Block

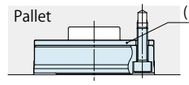
SWTJ 03 0 - D

1 2 3 4

1 Shape of Block

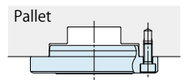
SWTB : Embedded Block
SWTJ : Flange Shaped Block

SWTB



Embedded Block

SWTJ



Flange Shaped Block

2 Accommodate SWT Clamp Model

01: SWT0010
02: SWT0020
03: SWT0030
05: SWT0050
08: SWT0080

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 (Level Adjustment Spacer)

※ This product is only for the embedded block of SWTB.
※ Material : Equal to S45C

VZ 0 06 0 - VSC

1 2

1 Accommodate SWTB Block Model No.

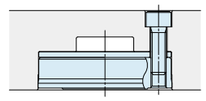
01: SWTB010-□
02: SWTB020-□
06: SWTB030-□
10: SWTB050-□
16: SWTB080-□

2 Design No.

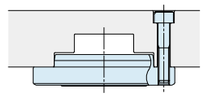
0 : Revision Number

Other Mounting Examples (Reference)

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

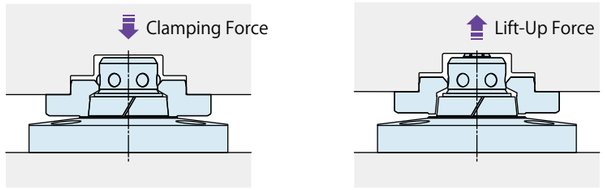


SWTB Block: Bolt Mounting from the Upper Side



SWTJ Block: Bolt Mounting from the Upper Side

Clamping Force / Lift-Up Force

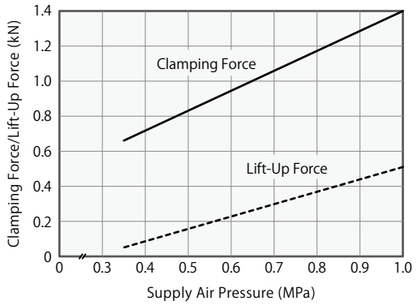


Notes
1. This graph shows the value for single clamp.
2. This graph shows the relationship between Supply Air Pressure and Clamping Force (solid line) / Lift-Up Force (dotted line).

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

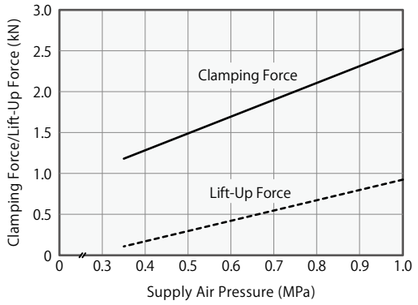
SWT0010-M□

Supply Air Pressure (MPa)	Clamping Force (kN)	Lift-Up Force (kN)
1.0	1.40	0.51
0.9	1.29	0.44
0.8	1.17	0.37
0.7	1.06	0.30
0.6	0.94	0.23
0.5	0.83	0.16
0.4	0.72	0.08
Holding Force at 0 MPa ※1	0.4	–
Operating Pressure Range (MPa)	0.35 ～ 1.0	



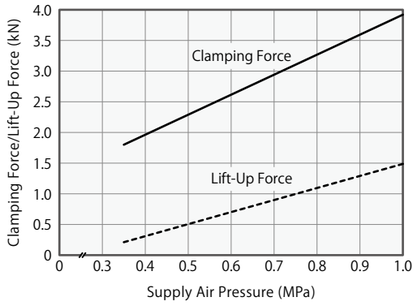
SWT0020-M□

Supply Air Pressure (MPa)	Clamping Force (kN)	Lift-Up Force (kN)
1.0	2.52	0.92
0.9	2.31	0.80
0.8	2.11	0.67
0.7	1.90	0.55
0.6	1.70	0.42
0.5	1.49	0.30
0.4	1.28	0.17
Holding Force at 0 MPa ※1	0.7	–
Operating Pressure Range (MPa)	0.35 ～ 1.0	



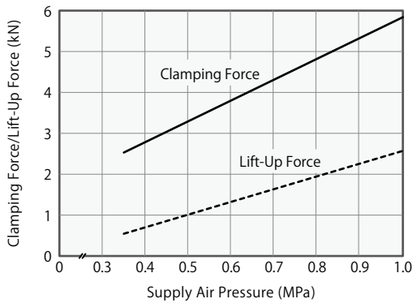
SWT0030-M□

Supply Air Pressure (MPa)	Clamping Force (kN)	Lift-Up Force (kN)
1.0	3.92	1.49
0.9	3.59	1.29
0.8	3.27	1.09
0.7	2.94	0.90
0.6	2.62	0.70
0.5	2.29	0.51
0.4	1.96	0.31
Holding Force at 0 MPa ※1	1.0	–
Operating Pressure Range (MPa)	0.35 ～ 1.0	



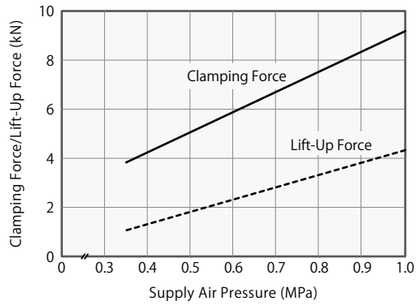
SWT0050-M□

Supply Air Pressure (MPa)	Clamping Force (kN)	Lift-Up Force (kN)
1.0	5.84	2.57
0.9	5.33	2.26
0.8	4.82	1.95
0.7	4.31	1.64
0.6	3.80	1.32
0.5	3.29	1.01
0.4	2.78	0.70
Holding Force at 0 MPa ※1	1.4	–
Operating Pressure Range (MPa)	0.35 ～ 1.0	

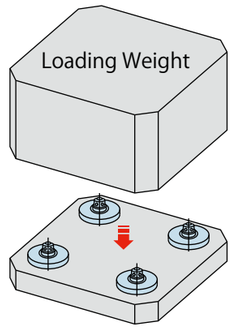


SWT0080-M□

Supply Air Pressure (MPa)	Clamping Force (kN)	Lift-Up Force (kN)
1.0	9.18	4.33
0.9	8.36	3.83
0.8	7.53	3.33
0.7	6.71	2.82
0.6	5.89	2.32
0.5	5.06	1.82
0.4	4.24	1.31
Holding Force at 0 MPa ※1	1.5	–
Operating Pressure Range (MPa)	0.35 ～ 1.0	



Loading Weight



Standard loading weight is Lift-Up Force×Number of Clamps×0.8 and it should be less than the maximum loading weight.

Model No.	SWT0010-M□	SWT0020-M□	SWT0030-M□	SWT0050-M□	SWT0080-M□
Maximum Loading Weight ※2 kg	200	400	600	800	1200

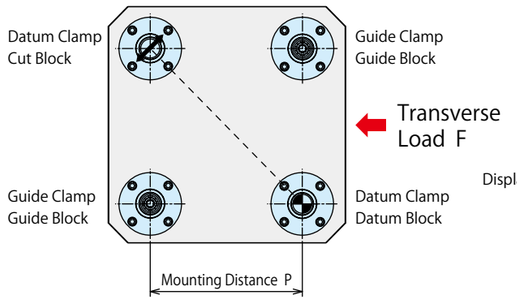
Note

※2. It indicates the weight of pallet in horizontal position (placed flat) that SWT can locate regardless of number of clamps. Release air pressure is determined with the loading weight (fixture). (Loading weight should be less than 80% of the lift-up force (Number of Clamps×Lift-Up Force)). When using pallet in vertical direction, please refer to P.69.

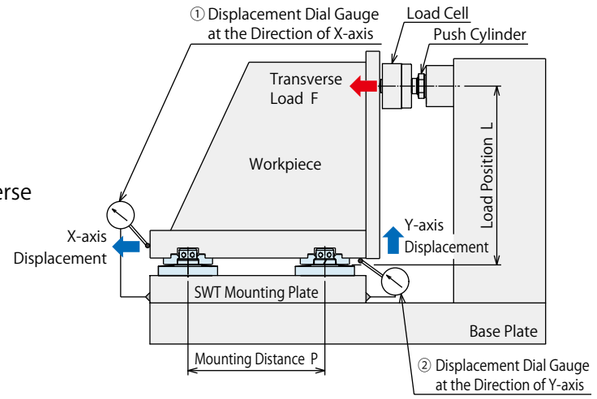
Displacement against Transverse Load

※ 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

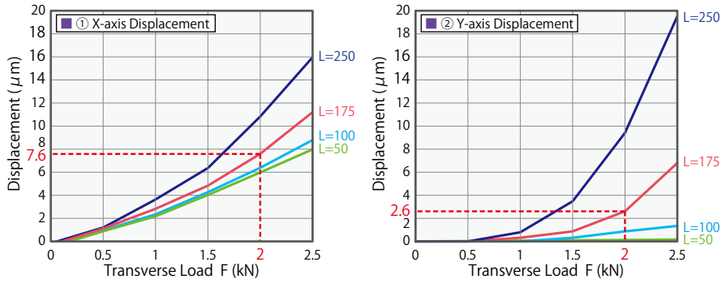
(Ex.) When using SWT0010

■ Components
【Clamp】
SWT0010-MD×2 Units
SWT0010-MG×2 Units
【Block】
SWTJ010-D×1 Unit
SWTJ010-C×1 Unit
SWTJ010-G×2 Units

■ Conditions

Mounting Distance	P=120mm
Load Position	L=175mm
Supply Air Pressure	0.5MPa
Transverse Load	F=2kN

■ Displacement
① X-axis displacement is about 7.6 μm.
② Y-axis displacement is about 2.6 μm.



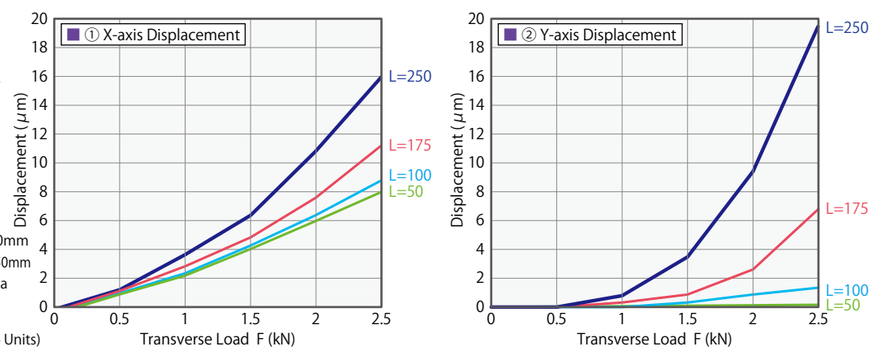
Note
1. Please contact us in case the conditions are different.

SWT0010

■ Components
【Clamp】
SWT0010-MD×2 Units
SWT0010-MG×2 Units
【Block】
SWTJ010-D×1 Unit
SWTJ010-C×1 Unit
SWTJ010-G×2 Units

■ Conditions
Mounting Distance P=120mm
Load Position L=50～250mm
Supply Air Pressure 0.5MPa

■ Clamping Force
Total 3.3kN (0.83kN×4 Units)

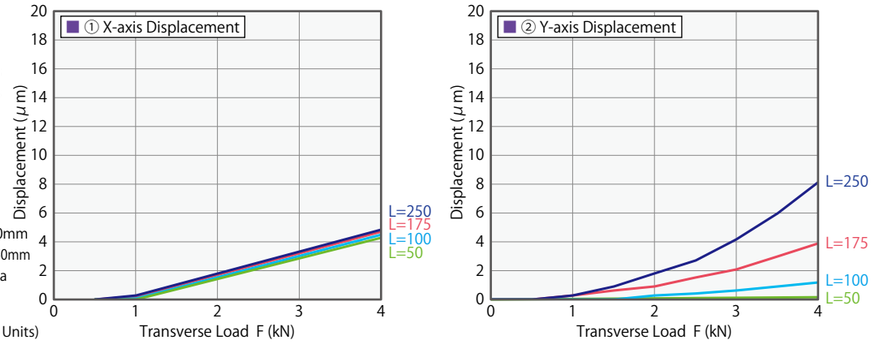


SWT0020

■ Components
【Clamp】
SWT0020-MD×2 Units
SWT0020-MG×2 Units
【Block】
SWTJ020-D×1 Unit
SWTJ020-C×1 Unit
SWTJ020-G×2 Units

■ Conditions
Mounting Distance P=200mm
Load Position L=50～250mm
Supply Air Pressure 0.5MPa

■ Clamping Force
Total 6.0kN (1.49kN×4 Units)

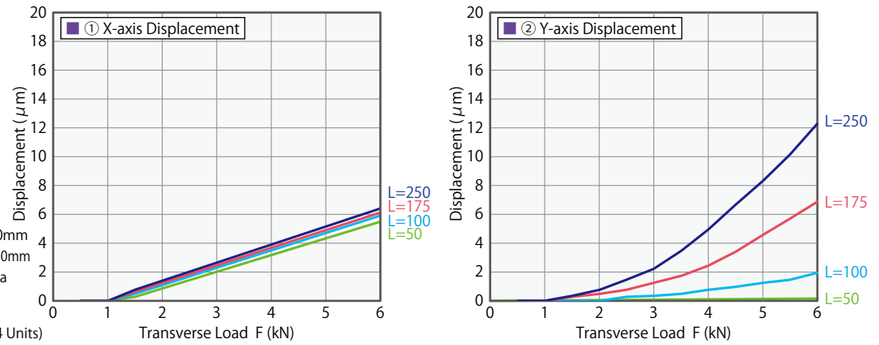


SWT0030

■ Components
【Clamp】
SWT0030-MD×2 Units
SWT0030-MG×2 Units
【Block】
SWTJ030-D×1 Unit
SWTJ030-C×1 Unit
SWTJ030-G×2 Units

■ Conditions
Mounting Distance P=200mm
Load Position L=50～250mm
Supply Air Pressure 0.5MPa

■ Clamping Force
Total 9.2 kN (2.29kN×4 Units)

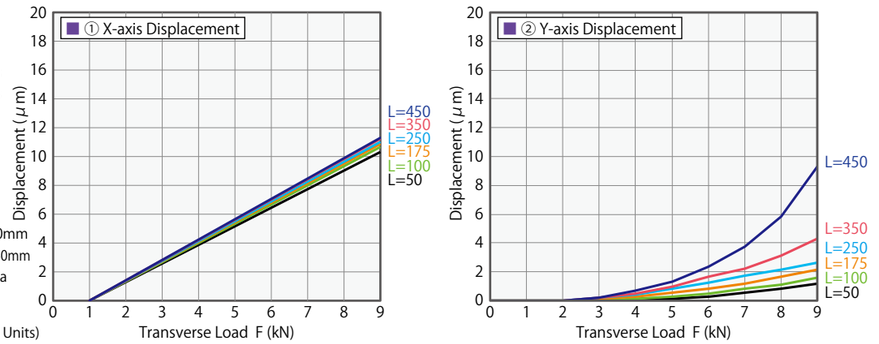


SWT0050

■ Components
【Clamp】
SWT0050-MD×2 Units
SWT0050-MG×2 Units
【Block】
SWTJ050-D×1 Unit
SWTJ050-C×1 Unit
SWTJ050-G×2 Units

■ Conditions
Mounting Distance P=300mm
Load Position L=50～450mm
Supply Air Pressure 0.5MPa

■ Clamping Force
Total 13.2kN (3.29kN× Units)

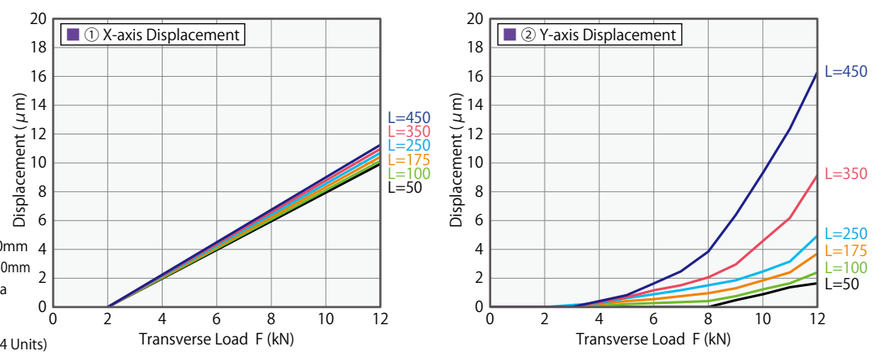


SWT0080

■ Components
【Clamp】
SWT0080-MD×2 Units
SWT0080-MG×2 Units
【Block】
SWTJ080-D×1 Unit
SWTJ080-C×1 Unit
SWTJ080-G×2 Units

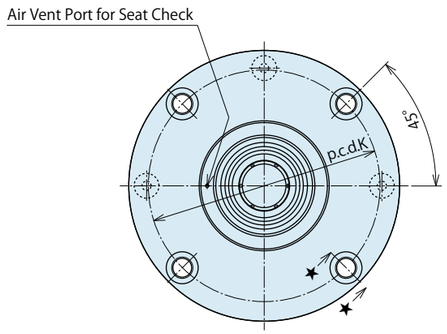
■ Conditions
Mounting Distance P=300mm
Load Position L=50～450mm
Supply Air Pressure 0.5MPa

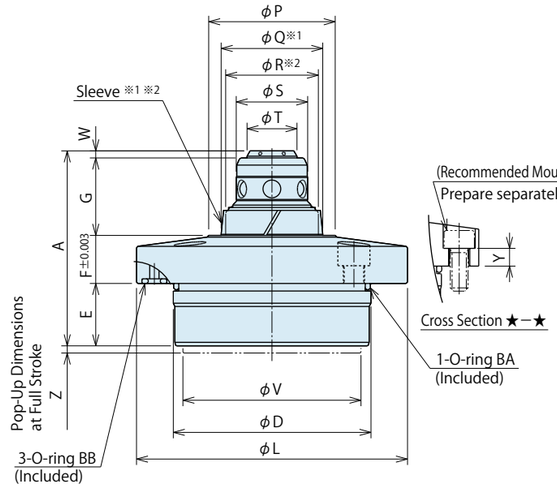
■ Clamping Force
Total 20.2kN (5.06kN×4 Units)



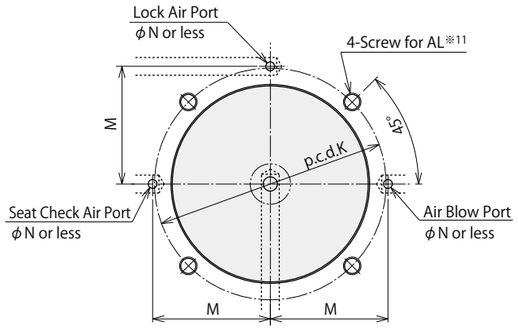
External Dimensions

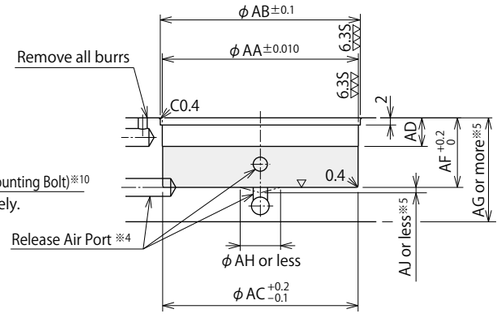
※This drawing shows the released state of SWT.



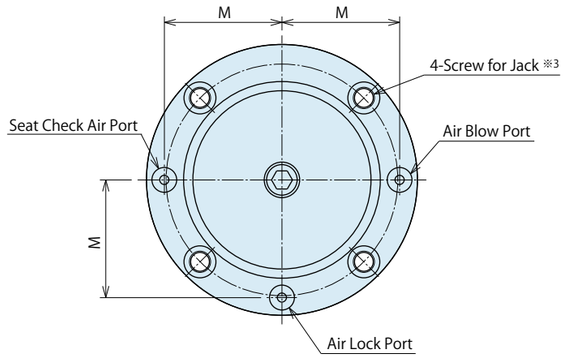


Machining Dimensions of Mounting Area



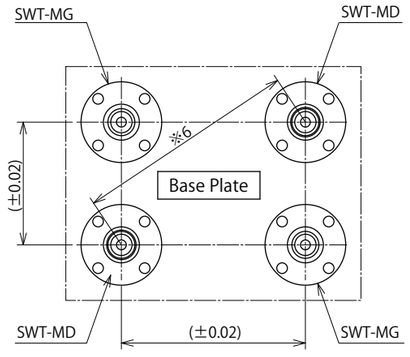


Notes
1. Remove all burrs around the hole intersection.
※4. The release air port is within ▭ range.
※5. The base thickness (AG) and remaining depth after boring (AJ) are reference values when the base material is S50C.



Notes
※1. ϕQ shows the dimensions of sleeve (taper) of datum clamp (SWT-MD).
※2. ϕR shows the dimensions of sleeve (straight) of guide clamp (SWT-MG).
※3. The screw for jack is used when removing the clamp. (See P.70 for usage.)

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.			SWT0010-M□	SWT0020-M□	SWT0030-M□	SWT0050-M□	SWT0080-M□
Locating Repeatability		mm	0.003				
Full Stroke		mm	2.8	3.4	3.4	4.0	4.5
Lift Up Stroke		mm	1.0				
Offset Tolerance when fixture pallet is set		mm	1.0	1.0	1.5	1.5	1.5
Max. Loading Weight ※8		kg	200	400	600	800	1200
Cylinder Capacity ※7	Lock	cm³	1.79	3.88	6.14	11.33	20.58
	Release		1.98	4.27	6.68	12.47	22.62
Holding Force at 0 MPa ※7 ※9		kN	0.4	0.7	1.0	1.2	1.5
Max. Operating Pressure		MPa	1.0				
Min. Operating Pressure		MPa	0.35				
Withstanding Pressure		MPa	1.5				
Air Blow Pressure		MPa	0.4～0.5				
Operating Temperature		℃	0～70				
Usable Fluid			Dry Air				
Mass※7		kg	0.25	0.5	0.8	1.3	2.5

Notes
※7. The specifications per one unit.
※8. It indicates the weight of pallet in horizontal position (placed flat) that SWT can locate regardless of number of clamps.
Release air pressure is determined with the loading weight (fixture).
(Loading weight should be less than 80% of the lift-up force (Number of Clamps×Lift-Up Force)).
When using pallet in vertical direction, please refer to P.69.
※9. It shows holding force at 0MPa air pressure and does not satisfy specifications.

External Dimensions and Machining Dimensions for Mounting

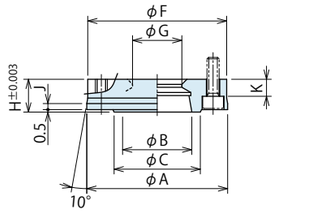
(mm)

Model No.		SWT0010-M□	SWT0020-M□	SWT0030-M□	SWT0050-M□	SWT0080-M□
A		42.3	51.7	54.7	62.2	71.2
D	SWT-MD	34.5 +0.030 +0.011	45 +0.030 +0.011	55 +0.030 +0.011	69 +0.030 +0.011	87.5 +0.030 +0.011
	SWT-MG	34.5 0 −0.020	45 0 −0.020	55 0 −0.020	69 0 −0.020	87.5 0 −0.020
E		13.1	16	17.5	18	20
F		10	12	13.5	16	20
G		17.8	21.7	21.7	26.5	29.5
K		44	55	65	81	102.5
L		53	66	76	94	118.5
M		22	28	33	41	51.5
N		2	2.5	2.5	3	5
P		26	32	35.5	44	51
Q		20	25	28.5	36	42
R		17.8	22.5	26	32.3	38.3
S		14	18	20	26	32
T		9	12	14	18.8	22.4
V		30	40	50	63	80
W		1.4	2	2	1.7	1.7
Y ※11		4.3	4	5	6	8.2
Z		1.4	2	2	2	3
AA		34.5	45	55	69	87.5
AB		34.7	45.2	55.2	69.2	87.7
AC		34.3	44.8	54.8	68.8	87.3
AD		8	8	8	9	10
AF		14.5	18	19.5	20	23
AG		18	22	24	25	28
AH		7	9	11	14	17
AJ		2.5	2.5	2.5	2.5	2.5
AL (Nominal×Pitch×Depth) ※11		M4×0.7×8 or more	M5×0.8×10 or more	M5×0.8×10 or more	M6×1×10 or more	M8×1.25×14 or more
1-O-ring BA		AS568-026(70°)	AS568-030(70°)	AS568-033(70°)	AS568-037(70°)	AS568-042(70°)
3-O-ring BB		AS568-005(70°)	AS568-007(70°)	AS568-007(70°)	1AP5	1AP7
(Recommended Mounting Bolt)※10		M4×0.7×10 or more	M5×0.8×12 or more	M5×0.8×12 or more	M6×1×14 or more	M8×1.25×20 or more
Screw for Jack		M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5

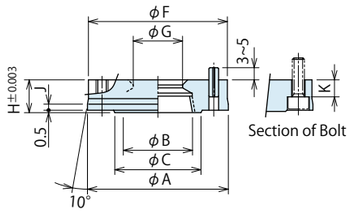
Notes
※10. Mounting bolt is not included. Please prepare it separately. (Refer to P.67 for further information.)
※11. Determine AL thread depth for mounting bolt according to 'Y' dimension.

External Dimensions

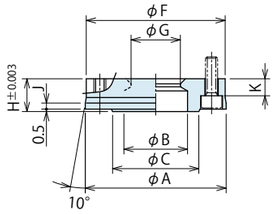
SWTB□0-D

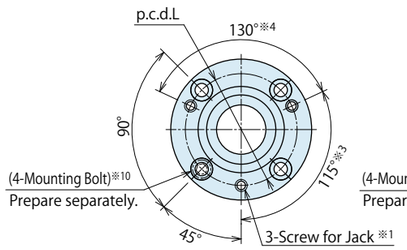


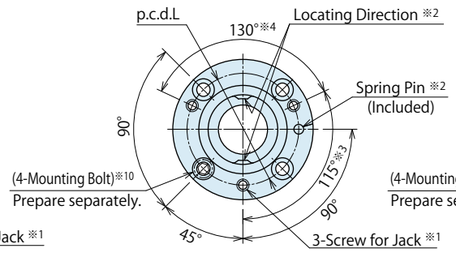
SWTB□0-C

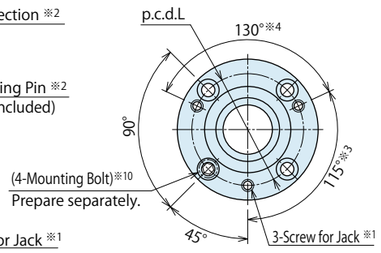


SWTB□0-G/F





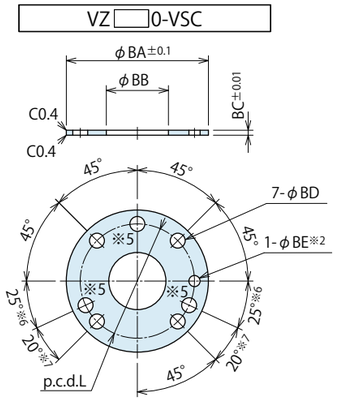




Notes
※1. The screw for jack is used when removing SWTB block.
※2. The spring pin is used for phasing of SWTB-C locating direction.
※3. 114° for SWTB010-□
※4. 132° for SWTB010-□

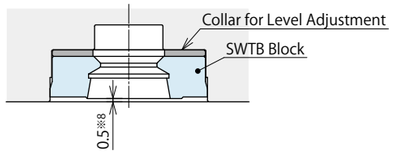
Dimensions of Collar for Level Adjustment

VZ□0-VSC



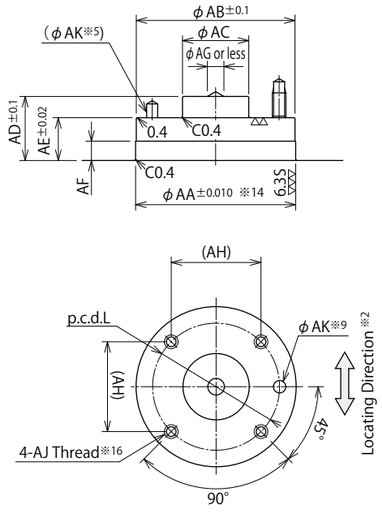
Notes
1. Please refer to the drawing above in case the collar for level adjustment is prepared by yourself.
※5. (3 parts) are for jack screw. Align them with the phase of jack screw of SWTB block.
※6. 24° for VZ0010-VSC
※7. 21° for VZ0010-VSC

※Mounting of Collar for Level Adjustment.



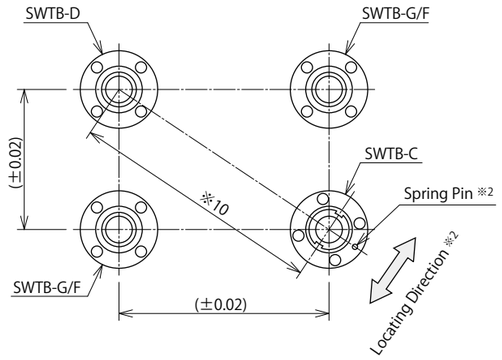
※8. Clearance between the seating area of SWTB block and block bottom.

Machining Dimensions of Mounting Area

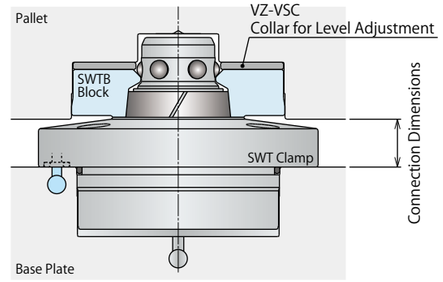


Notes
1. This drawing shows the case where the clearance between the seating area of SWTB block and pallet bottom is 0.5mm when the collar for level adjustment is used.
※9. ϕAK hole is used for phasing of SWTB-C positioning direction. Please make sure ϕAK hole is at the line connecting the centers of SWTB-D and SWTB-C. This machining is only necessary for SWTB-C.

Mounting Distance Accuracy and SWTB-C Phase



Connection Dimensions



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

External Dimensions and Machining Dimensions for Mounting

(mm)

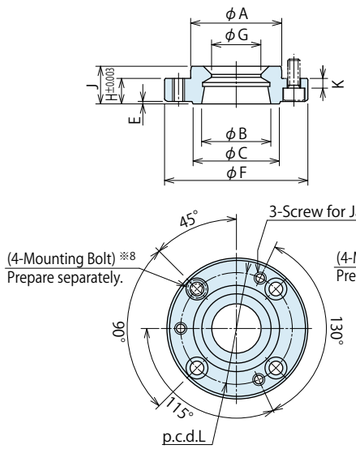
Model No.	SWTB010-D SWTB010-C	SWTB010-G SWTB010-F	SWTB020-D SWTB020-C	SWTB020-G SWTB020-F	SWTB030-D SWTB030-C	SWTB030-G SWTB030-F	SWTB050-D SWTB050-C	SWTB050-G SWTB050-F	SWTB080-D SWTB080-C	SWTB080-G SWTB080-F
A	43 +0.027 +0.011	43g7 -0.009 -0.034	50 +0.027 +0.011	50g7 -0.009 -0.034	58m6 +0.030 +0.011	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	20	18 (20.5)※11	25	22.7 (25.5)※11	28.5	26.2 (29)※11	36	32.5(36.5)※11	42	38.5(42.5)※11
C	26		32		35.5		44		51	
F	42.5		49.2		57.2		69.2		82.2	
G	14.25		18.3		20.3		26.3		32.3	
H	10		13		13		16.5		17.5	
J	2.5		2.5		2.5		2.5		3	
K	5		8		7		9.5		8.5	
L	34		40		46		56		66	
AA※14	43		50		58		70		83	
AB	42.8		49.5		57.5		69.5		82.5	
AC	18		22		24		30		36	
AD	18.7		23.2		23.2		27.7		30.7	
AE	12.5		15.5		15.5		20		21	
AF	6		7		7		8		8	
AG	3		3		3		5		5	
(AH)	24.04		28.28		32.53		39.6		46.67	
AJ (Nominal×Pitch×Depth)※16	M4×0.7×6 or more		M4×0.7×7 or more		M5×0.8×8 or more		M6×1×10 or more		M8×1.25×14.5 or more	
AK	ϕ3.4 Depth 5	-	ϕ3.4 Depth 5	-	ϕ4.5 Depth 5	-	ϕ4.5 Depth 5	-	ϕ4.5 Depth 5	-
(Recommended Mounting Bolt)※15	M4×0.7×12		M4×0.7×16		M5×0.8×16		M6×1×20		M8×1.25×25	
Screw for Jack	M4×0.7		M4×0.7		M5×0.8		M6×1		M8×1.25	
Spring Pin ※12	ϕ3×10	-	ϕ3×10	-	ϕ4×10	-	ϕ4×10	-	ϕ4×10	-
Mass	0.08 kg		0.15 kg		0.2 kg		0.35 kg		0.5 kg	
Appropriate Clamp	SWT0010-MD	SWT0010-MG ※13 SWT0010-MD	SWT0020-MD	SWT0020-MG ※13 SWT0020-MD	SWT0030-MD	SWT0030-MG ※13 SWT0030-MD	SWT0050-MD	SWT0050-MG ※13 SWT0050-MD	SWT0080-MD	SWT0080-MG ※13 SWT0080-MD
Connection Dimensions When Lock	9.5		11.5		13		15.5		19.5	
Connection Dimensions When Release	10.5		12.5		14		16.5		20.5	

Model	VZ0010-VSC	VZ0020-VSC	VZ0060-VSC	VZ0100-VSC	VZ0160-VSC
BA	42.5	49.2	57.2	69.2	82.2
BB	19	23	25	32	38
BC	2	2	2	3	3
BD	5	5	6	7.5	10
BE	3.4	3.4	4.5	4.5	4.5
Mass	0.016 kg	0.021 kg	0.03 kg	0.062 kg	0.085 kg

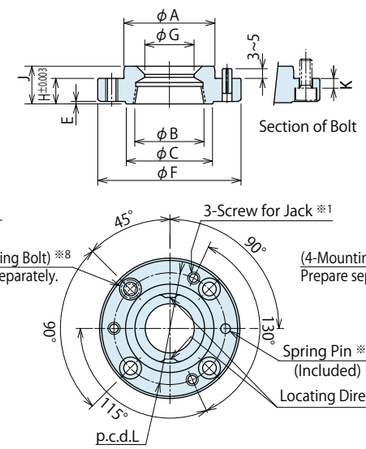
Notes
1. Material of SWTB Block：SUS, Material of VZ□-VSC Level Adjustment Collar：Equivalent to S45C
※11. The dimensions in ( ) display that of SWTB-F.
※12. The spring pin is included only in SWTB-C.
※13. The guide block (SWTB-G) is used only for guide clamp (SWT□-MG) and the free block (SWTB-F) can be used for both datum clamp (SWT□-MD) and guide clamp (SWT□-MG).
※14. Pallet with low rigidity (thin pallet or pallet made of aluminum etc.) may be deformed when mounting SWTB block. In this case, tolerance of mounting hole machining dimension AA±0.010 should be close to +0.010 (the upper limit of the tolerance).
※15. Mounting bolt is not included. Please prepare it separately. (Refer to P.67 for further information.)
※16. Determine AJ thread depth for mounting bolt according to 'K' and 'BC' dimension.

External Dimensions

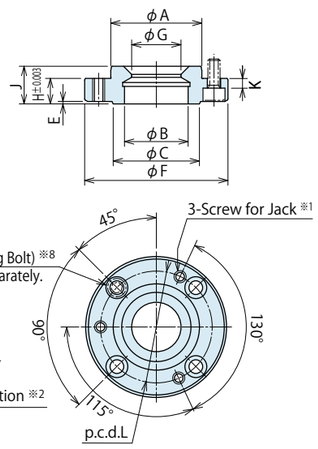
SWTJ010/020/030-D



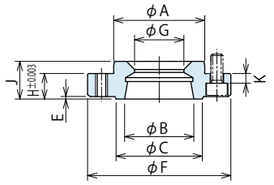
SWTJ010/020/030-C



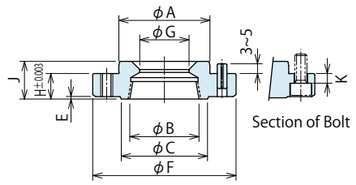
SWTJ010/020/030-G
SWTJ010/020/030-F



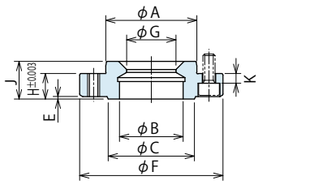
SWTJ050/080-D

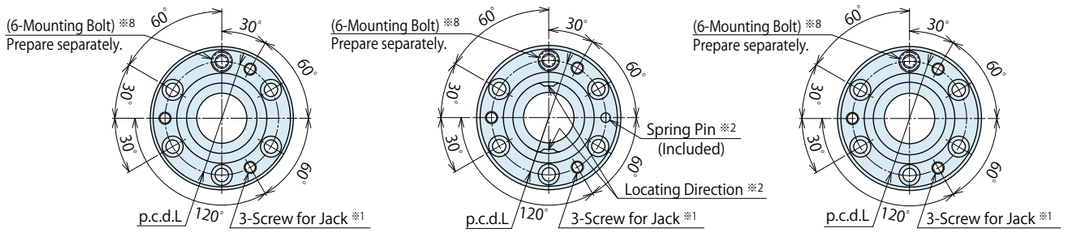


SWTJ050/080-C



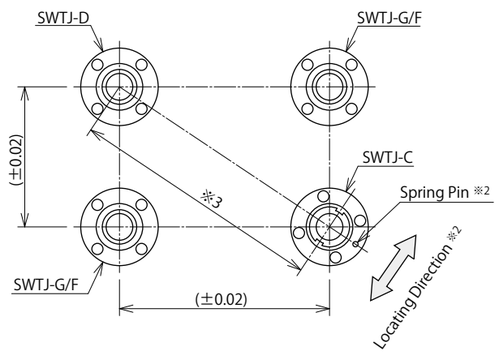
SWTJ050/080-G
SWTJ050/080-F



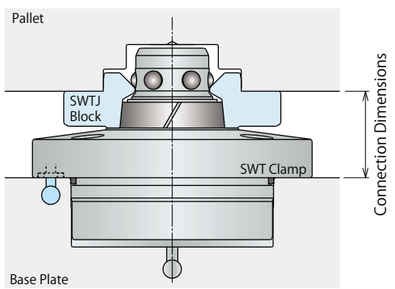


Notes
※1.The screw for jack is used when removing SWTJ block.
※2.The spring pin is used for phasing of SWTJ-C locating direction.

Mounting Distance Accuracy and SWTJ-C Phase



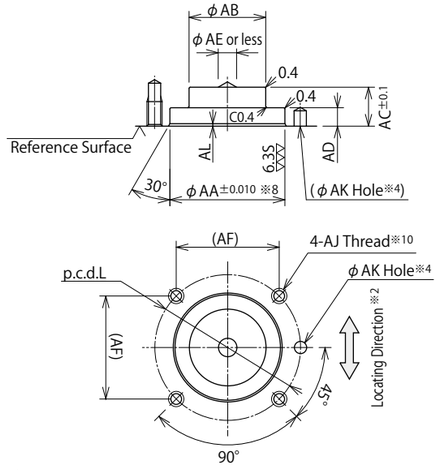
Connection Dimensions



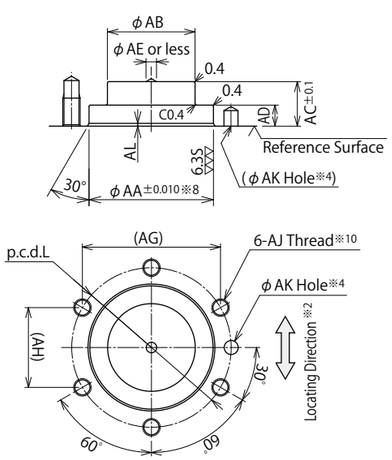
Note
※3. Please make sure the precision between block pitches is within ±0.025mm between the blocks with the longest distance.

Machining Dimensions of Mounting Area

SWTJ010/020/030-□



SWTJ050/080-□



Notes
※4. ϕAK hole is used for phasing of SWTJ-C positioning direction. Please make sure ϕAK hole is at the line connecting the centers of SWTJ-D and SWTJ-C. This machining is only necessary for SWTJ-C.

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	SWTJ010-D SWTJ010-C	SWTJ010-G SWTJ010-F	SWTJ020-D SWTJ020-C	SWTJ020-G SWTJ020-F	SWTJ030-D SWTJ030-C	SWTJ030-G SWTJ030-F	SWTJ050-D SWTJ050-C	SWTJ050-G SWTJ050-F	SWTJ080-D SWTJ080-C	SWTJ080-G SWTJ080-F
A	26 +0.024 +0.011	26g7 -0.007 -0.028	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	20	18 (20.5)※5	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	26		32		35.5		44		51	
E	0.3		0.5		0.5		0.5		0.5	
F	43		49		59		74		89	
G	14.25		18.3		20.3		26.3		32.3	
H	7		8		10		10		12	
J	11		13		15		16.5		18.5	
K ※10	2.5		3.3		4.2		4.2		5.2	
L	34		40		47.5		62.5		75	
AA※8	26		31.5		37.5		52		62	
AB	18		22		25		31		38	
AC	11.2		14.7		12.7		17.2		18.2	
AD	5		6		6		7.5		7.5	
AE	3		3		3		5		5	
(AF)	24.04		28.28		33.59		-		-	
(AG)	-		-		-		54.13		64.95	
(AH)	-		-		-		31.25		37.5	
AJ (Nominal×Pitch×Depth)※10	M4×0.7×7 or more		M4×0.7×8 or more		M5×0.8×9 or more		M5×0.8×9 or more		M6×1×10 or more	
AK	ϕ3.4 Depth 5	-	ϕ3.4 Depth 5	-	ϕ4.5 Depth 5	-	ϕ4.5 Depth 5	-	ϕ4.5 Depth 5	-
AL	0.8		0.8		0.8		0.8		0.84	
(Recommended Mounting Bolt) ※9	M4×0.7×8 or more		M4×0.7×10 or more		M5×0.8×12 or more		M5×0.8×12 or more		M6×1×14 or more	
Screw for Jack	M4×0.7		M4×0.7		M5×0.8		M5×0.8		M6×1	
Spring Pin ※6	ϕ3×10	–	ϕ3×10	–	ϕ4×10	–	ϕ4×10	–	ϕ4×10	–
Mass	0.07kg		0.1kg		0.18kg		0.3kg		0.55kg	
Appropriate Clamp	SWT0010-MD	SWT0010-MG ※7 SWT0010-MD	SWT0020-MD	SWT0020-MG ※7 SWT0020-MD	SWT0030-MD	SWT0030-MG ※7 SWT0030-MD	SWT0050-MD	SWT0050-MG ※7 SWT0050-MD	SWT0080-MD	SWT0080-MG ※7 SWT0080-MD
Connection Dimensions When Lock	17		20		23.5		26		32	
Connection Dimensions When Release	18		21		24.5		27		33	

Notes
1. Material of SWTJ Block：SUS
※5. The dimensions in ( ) display that of SWTJ-F.
※6. The spring pin is included only in SWTJ-C.
※7. The guide block (SWTJ-G) is used only for guide clamp (SWT□-MG) and the free block (SWTJ-F) can be used for both datum clamp (SWT□-MD) and guide clamp (SWT□-MG).
※8. Pallet with low rigidity (thin pallet or pallet made of aluminum etc.) may be deformed when mounting SWTJ block. In this case, tolerance of mounting hole machining dimension AA±0.010 should be close to +0.010 (the upper limit of the tolerance).
※9. Mounting bolt is not included. Please prepare it separately. (Refer to P.67 for further information.)
※10. Determine AJ thread depth for mounting bolt according to 'K' dimension.

Accessory：Pneumatic Location Clamp Mounting Bolt

Mounting bolts are not included in pneumatic location clamp (Model No. SWT/SWTB/SWTJ).
If you require mounting bolts (Material：SCM Strength Grade 12.9), prepare the bolts shown below.
(For SUS bolts etc., they should be prepared by customer.)

Model No. Indication

SWZ 03 0 - SWT 1

1 2 3

1 Applicable Model No.

01 ：SWT0010, SWTB010, SWTJ010
02 ：SWT0020, SWTB020, SWTJ020
03 ：SWT0030, SWTB030, SWTJ030
05 ：SWT0050, SWTB050, SWTJ050
08 ：SWT0080, SWTB080, SWTJ080

2 Design No.

0 ：Revision Number

3 Functions

SWT ：A Set of Bolts for SWT (Clamp)
SWTB ：A Set of Bolts for SWTB (Embedded Block)
SWTJ ：A Set of Bolts for SWTJ (Flange Shaped Block)

Model No.	SWZ010-SWT1	SWZ020-SWT1	SWZ030-SWT1	SWZ050-SWT1	SWZ080-SWT1
Applicable Model	SWT0010-M□	SWT0020-M□	SWT0030-M□	SWT0050-M□	SWT0080-M□
Bolt Size	M4×0.7×10	M5×0.8×12	M5×0.8×12	M6×1×14	M8×1.25×20
Number of Bolts	4 (For One Clamp)				

Model No.	SWZ010-SWTB1	SWZ020-SWTB1	SWZ030-SWTB1	SWZ050-SWTB1	SWZ080-SWTB1
Applicable Model	SWTB010-□	SWTB020-□	SWTB030-□	SWTB050-□	SWTB080-□
Bolt Size	M4×0.7×12	M4×0.7×16	M5×0.8×16	M6×1×20	M8×1.25×25
Number of Bolts	4 (For One Block)				

Model No.	SWZ010-SWTJ1	SWZ020-SWTJ1	SWZ030-SWTJ1	SWZ050-SWTJ1	SWZ080-SWTJ1
Applicable Model	SWTJ010-□	SWTJ020-□	SWTJ030-□	SWTJ050-□	SWTJ080-□
Bolt Size	M4×0.7×8	M4×0.7×10	M5×0.8×12	M5×0.8×12	M6×1×14
Number of Bolts	4 (For One Block)			6 (For One Block)	

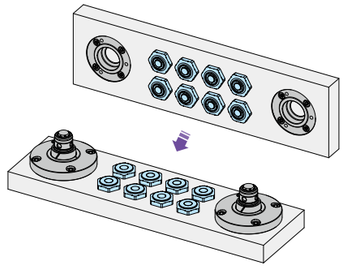
Notes
1. Material of Bolt：SCM (Strength Grade：12.9)
※1. The number of bolts shows the quantity of bolts for one set.
(Number of bolts per one set is required for mounting one clamp or one block.)
(Ex. If you require SWT0020-MD (Clamp)×2 units, order 2 sets of SWZ020-SWT1.)

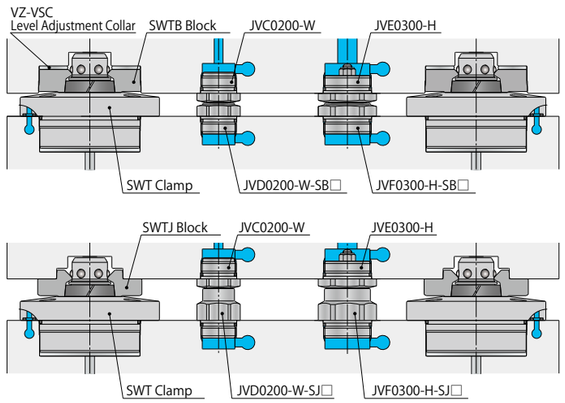
Related Products

Auto Coupler (Oil/Air/Coolant) model JVC/JVD、JVE/JVF
→ P.329～P.336

Coupler with the minimum connection stroke enhances automation.
Compact and able to install in limited spaces.

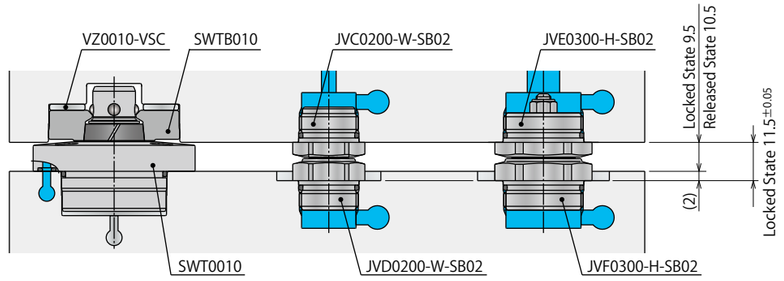
Image





Connection Reference when using SWTB010

Spot facing shown below is required only when using JVC/JVD, JVE/JVF with the combination of SWT0010 and SWTB010.



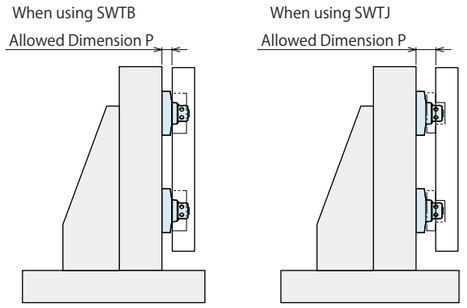
Cautions

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 φ6mm.

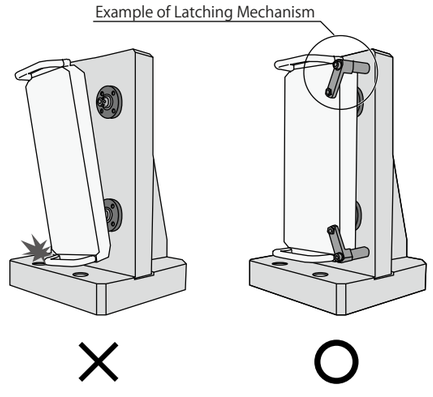
3) When the pallet is in vertical position.
- When the workpiece・pallet is being set, make sure it is in proper proximity and square to the clamps. If it is locked out of position, the machine or clamps may be damaged.



Allowed Dimension P (mm)

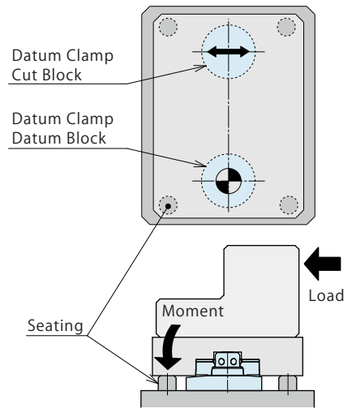
Model No.	SWT0010	SWT0020	SWT0030	SWT0050	SWT0080
SWTB Block	11	13	14.5	17	21
SWTJ Block	18.5	21.5	25	27.5	33.5

- As the workpiece・pallet 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.

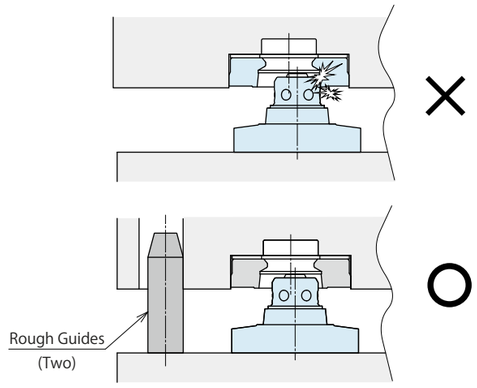


- When the pallet is in horizontal position (leveled), make sure the weight of the workpiece・pallet is less than the lift force of the clamps and maximum load of the machine.
- When the pallet is in vertical position, make sure the weight of workpiece・pallet is 10% of the clamping force.
- Please contact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

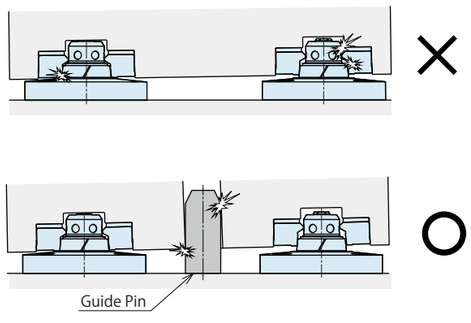
4) Seat Setting
- In case the clamp/block configuration is linear, it is recommended to provide additional supports for stability.



5) Setting of Rough Guide
- If the position of the pallet (fixture) during loading is outside the clamp offset tolerance, the clamp may prematurely contact the seating/taper surface of the block (SWTB/SWTJ-D) causing damage affecting locating precision. It is recommended to use rough guides to contain the pallet within the offset tolerance.

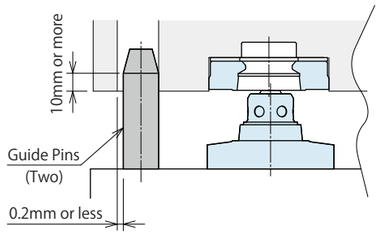


- The pallet must be level when lowering or lifting from the location clamps. If necessary, provide guide pins to keep the pallet level during loading and unloading.



6) Prepare a guide in case not using the guide block (SWTB/SWTJ-G).
- The combination of guide clamp (SWT-G) and guide block (SWTB/SWTJ-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 (SWTB/SWTJ-D) cut block (SWTB/SWTJ-C) is used.
When only the combination of datum clamp and free block (SWTB/SWTJ-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.

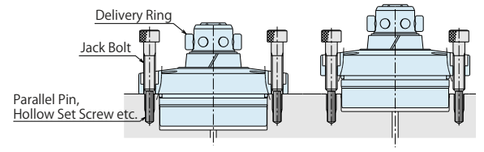
2) Procedure before Piping
- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with this product for prevention of contaminants in the air circuit.

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.

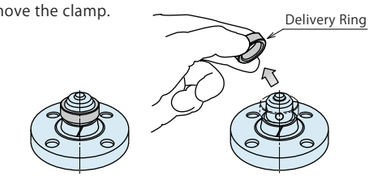
4) Mounting the Body
- Tighten hexagon socket bolts (Accessories：SWZ□0-□1 Mounting Bolt, SCM Bolt Strength Grade 12.9) with the torque shown in the chart below. Tighten them evenly to prevent twisting or jamming.

Clamp Model No.	Block Model No.		Thread Size	Tightening Torque
SWT	SWTB	SWTJ		(N・m)
SWT0010	SWTB010 SWTB020	SWTJ010 SWTJ020	M4×0.7	3.2
SWT0020 SWT0030	SWTB030	SWTJ030 SWTJ050	M5×0.8	6.3
SWT0050	SWTB050	SWTJ080	M6×1	10
SWT0080	SWTB080	–	M8×1.25	25

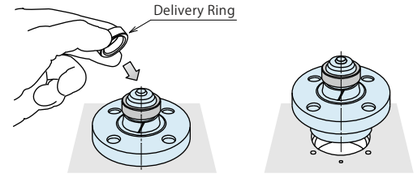
5) Removal
- Mount the delivery ring.
- Use jack bolts to remove the clamp in parallel.
- Protect the thread part with parallel pins as shown in the drawing below in order for the jack bolts not to damage the thread part of mounting bolt.



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 location clamp is mounted on the fixture, remove the delivery ring before use. (When the delivery ring is removed, ensure to supply the release pneumatic pressure.)
- Please take good care of the delivery ring as it is necessary to remove the clamp.

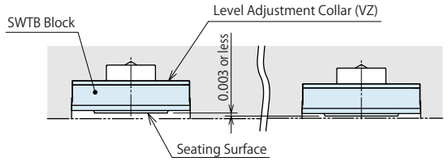


- When removing the location clamp from the pallet・fixture, mount the delivery ring in advance. In case it is removed without the delivery ring, the internal parts may be separated by the spring, which cannot be recovered.



7) Level Adjustment of SWTB Block Seating Surface
- When the pallet・fixture are assembled in the blocks, adjust the level of block seating surface in the way described below. (Recommended Level Adjustment: within ±0.003mm)

① Mount the level adjustment collar first and the block in the pallet・fixture, and tighten them with the 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 level adjustment collars so that the level range is within ±0.003mm.
④ Once again, assemble the block・level adjustment collar into the pallet・fixture and confirm the levels.



※ Please refer to P.363 for common cautions. ・Notes on Handling ・Maintenance/Inspection ・Warranty

High-Power Pneumatic Pallet Clamp

Model WVS

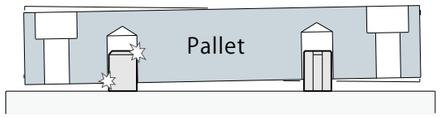
High Clamping Force with Built-in Mechanical Locking System

PAT.P.

Work Efficiency

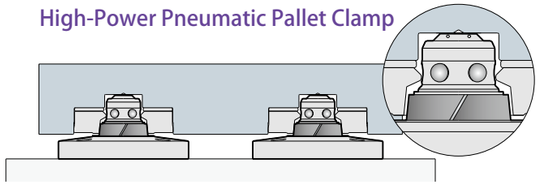
It is very difficult to position heavy pallets and plates on fixed pins.
For pallet clamp, anyone can change fixtures with high accuracy.
This enables smooth pallet loading/unloading.
Suitable for Automatic Pallet Change with Robots.

Fixed Pin + Manual Tightening with Bolt

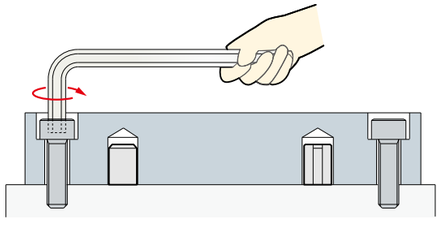


Difficult to Load • Apt to Get Stuck

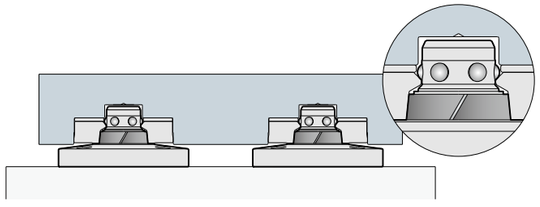
High-Power Pneumatic Pallet Clamp



Easy to Load (Suitable for Automation)



Manual Tightening
Accuracy Correction Required

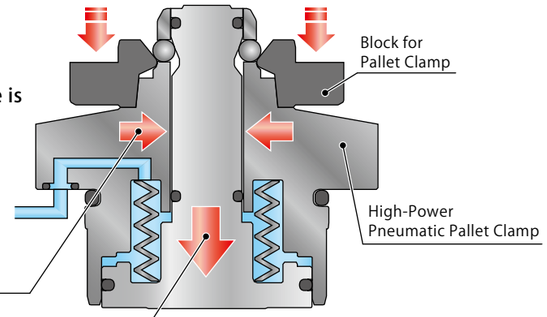


Locking in Mere Seconds
No Accuracy Correction Required
Locating Repeatability：3μm

Strong Clamping Force

Available in four body sizes cylinder output force is

4kN / 6kN /10kN / 16kN



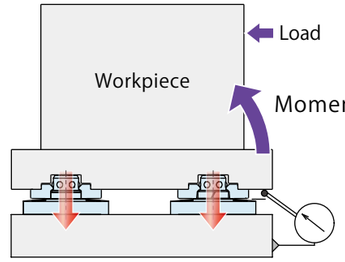
Stronger Holding Force with
Mechanical Lock

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 Rigidity

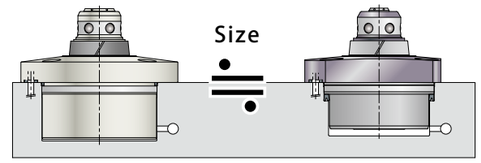
Clamping force is suppressed to necessary minimum by the powerful holding force beyond clamping force.



Displacement is very small.

Compact

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

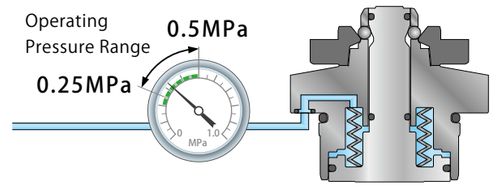


Model WVS
High-Power Pneumatic Pallet Clamp

Model VS
Hydraulic Model

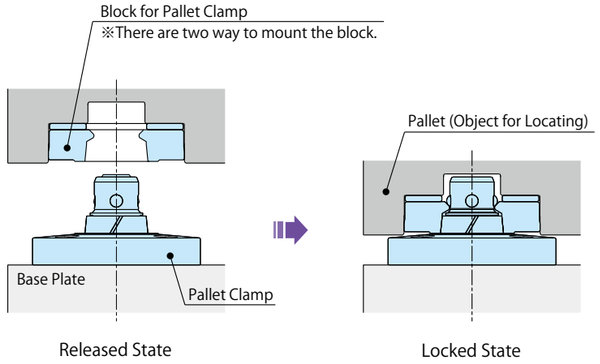
Energy Saving

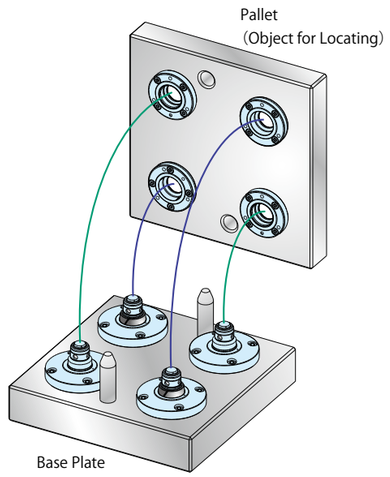
Higher clamping force achieved by low operating pressure.
No need to use air booster.



Function Description

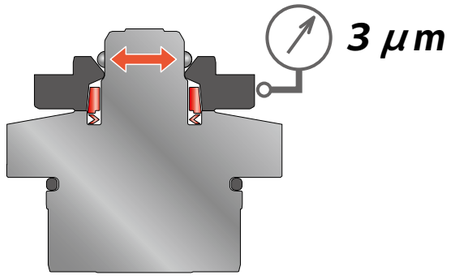
※Refer to the P.77 for detail.





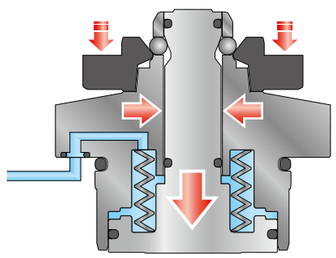
Repetitive Locating with High Accuracy

Locating Repeatability：3 μm
Fixture alignment inspection is eliminated in the machining center.



Clamping Function

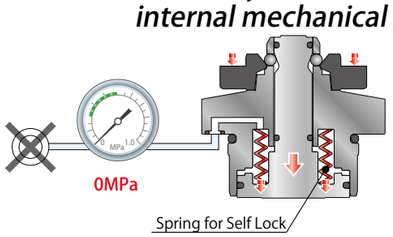
Clamping force is ranged from 2.4kN ～ 15.7kN.
Strong clamping force.



Self Lock (Safety) Function
(Holding force when air pressure becomes zero)

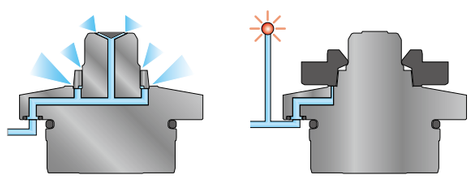
The internal mechanical lock operates and clamping force and holding force achieved. When pneumatic pressure is at zero, it will stay locked due internal mechanical lock.

It will stay locked with internal mechanical lock.



Air-Blow and Seat Check

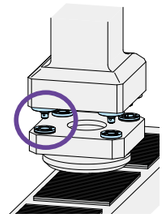
Foreign substance is removed by air blow.
Seating surface is provided with the air hole, seat check is possible if gap sensor is used.



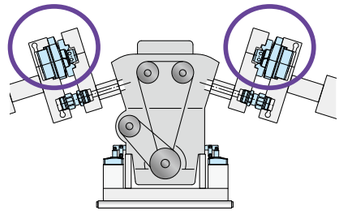
Advantages

● Setup improvement enhances productivity.

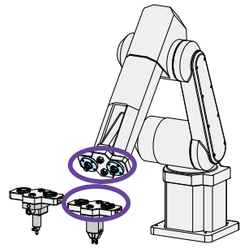
High-Power Pallet Clamp locates with high accuracy and clamps simultaneously. (Fixture alignment and inspection are eliminated.) Fixture change over is faster and easier, thus by eliminating alignment inspection for accuracy which is done in many different ways.



< Production Line of LCD Panels >



< Engine Test Device >

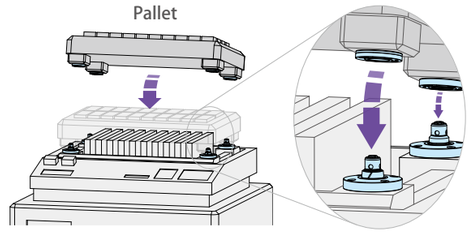


< Robot Tool Change Hand >

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

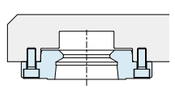
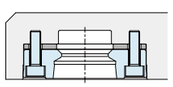
Since the fixture setting is outside, the machine idle time is reduced.

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



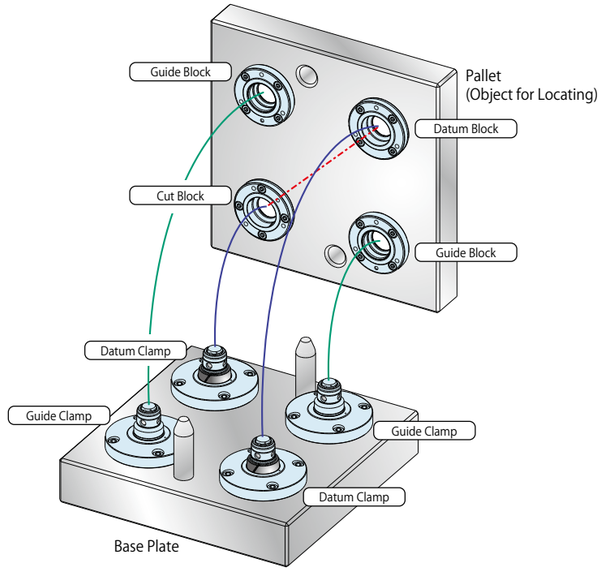
Manual Pallet Change

Pallet alignment is **Instant**

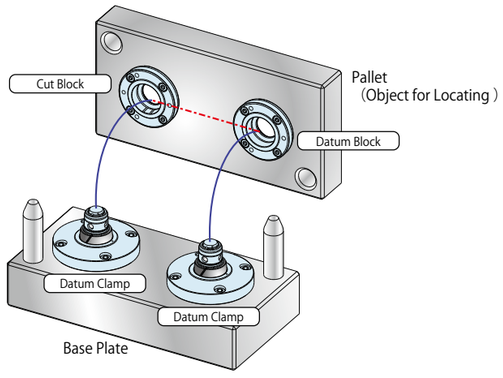
	 Model WVS → P.87	 Model VSJ → P.91	 Model VSB → P.89
Classification	Double Action Air Lock / Air Release	Flange Shaped Block	Embedded Block
Operating Pressure Range	0.25～0.5MPa	–	–
Features	• Strong Clamping Force with Mechanical Lock • With Self Lock by Spring	 Simple Mounting	 Straight Mounting
Accessories	–	–	Level Adjustment Collar (VSB Only) VZ-VSC → P.89

System References

Using Four Pneumatic Pallet Clamps



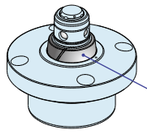
Using Two Pneumatic Pallet Clamps



Apparatus and Function

※ For Information about combination between clamps and blocks, please look at the P.81.

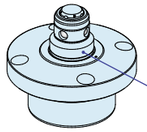
Datum Clamp



With Locating Function

Movable Taper Sleeve

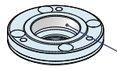
Guide Clamp



No Locating Function

Guide Part (Straight)

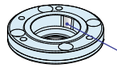
Datum Block



For Reference Plane Direction Locating

The Taper Reference Surface (Whole Circumference)

Cut Block

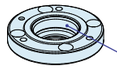


For One Direction Locating

The Taper Reference Surface (a part)

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

Guide Block

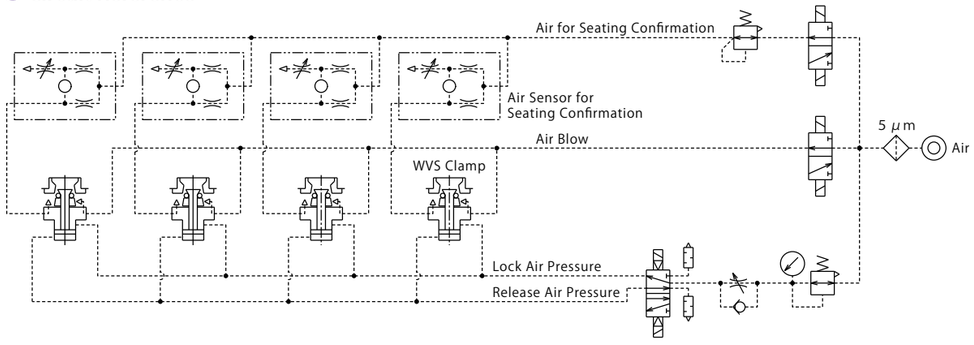


For Guide

Guide Part (Straight)

※ Free block does not have a guide function.

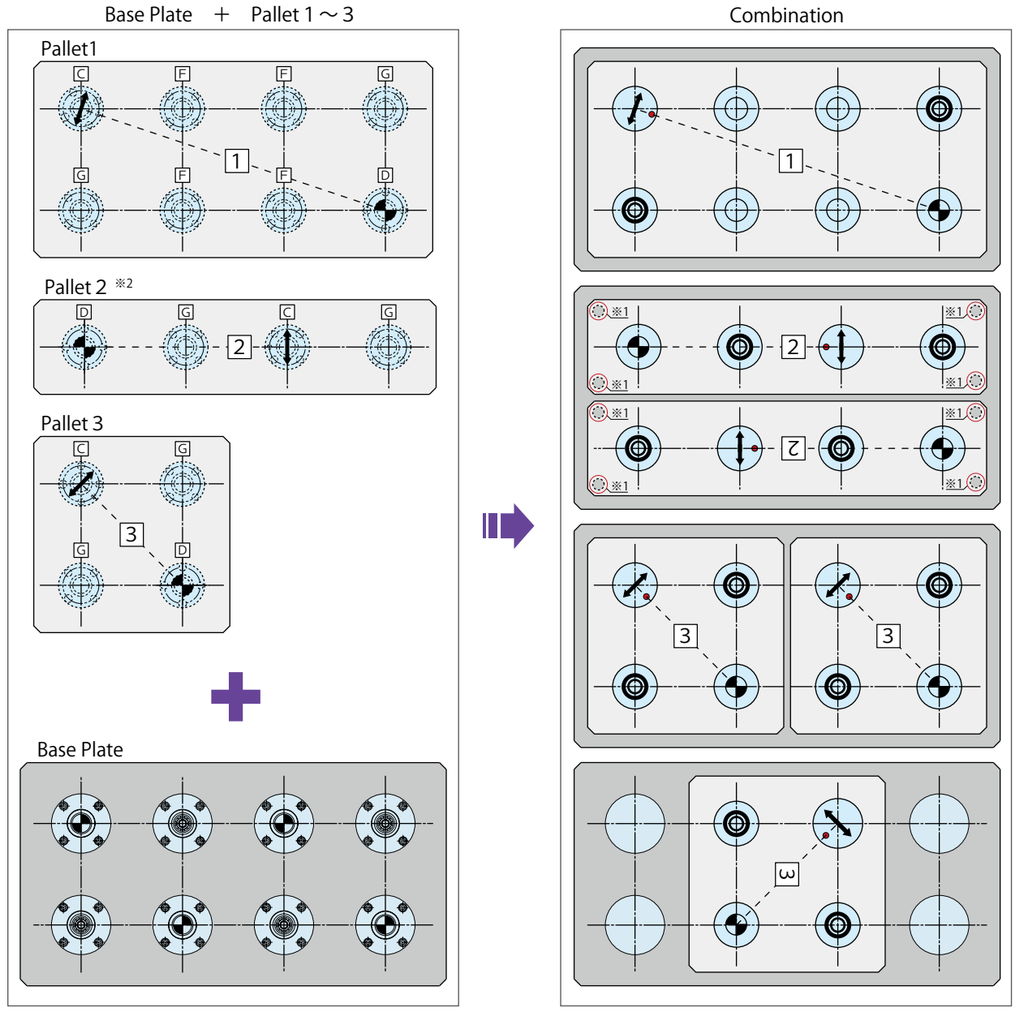
Circuit Reference



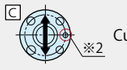
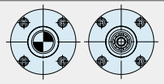
Note 1. It is recommended to use air blow line with at least ϕ6 in order to ensure effective air flow. Please supply clean filtered air.

Configuration Sample of Pallets with Different Sizes

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

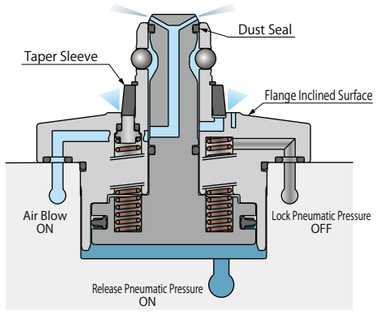
Equipment installed on the base plate		Equipment installed on the pallet		Functions when they are combined
	Datum Clamp		Datum Block	Clamping Function ＋ Locating Function (Reference Point)
	Datum Clamp		Cut Block	Clamping Function ＋ Locating Function (One Direction)
	Guide Clamp		Guide Block	Clamping Function ＋ Guide Function
	Datum Clamp or Guide Clamp		Free Block	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.)

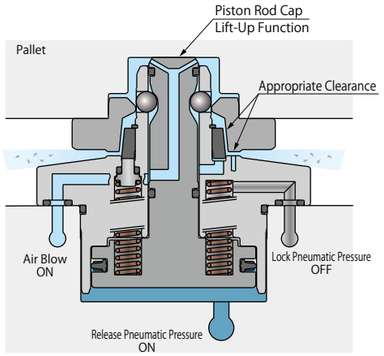
Action Description ※ This is a simplified drawing. Actual components are different.



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

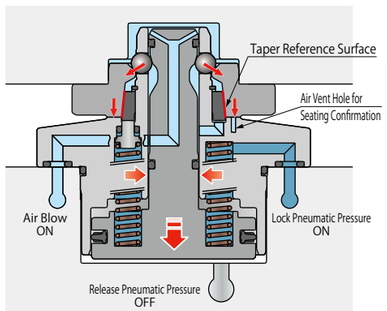
When the pallet is transported in

- 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



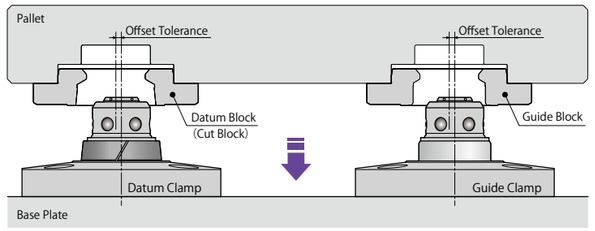
When clamped

- 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).

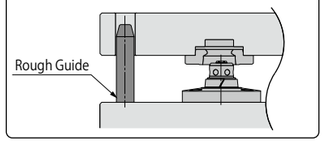
When clamped

Action Description during Loading/Unloading

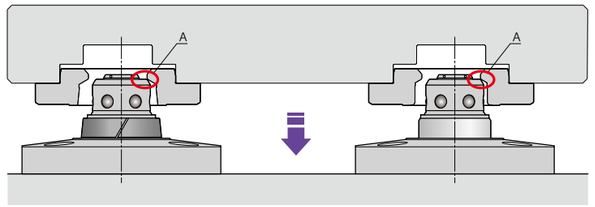
1. Pneumatic pressure releases the clamp. Position of pallet while loading must be kept within the allowable eccentricity.



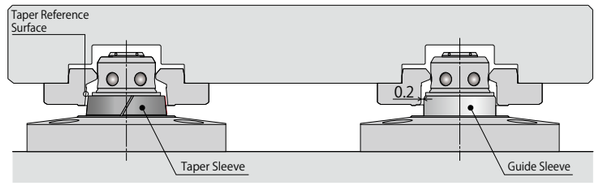
It is recommended to use rough guides to contain the pallet within the allowable eccentricity.



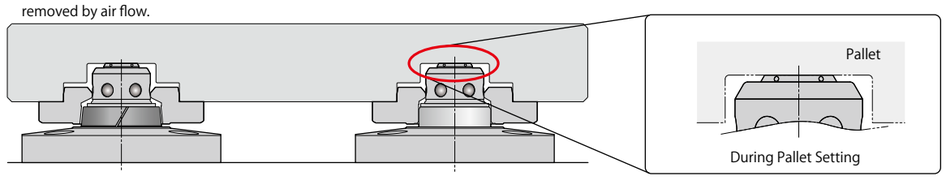
2. When the pallet is lowered, it should be positioned so the blocks contact the rod as shown on A.



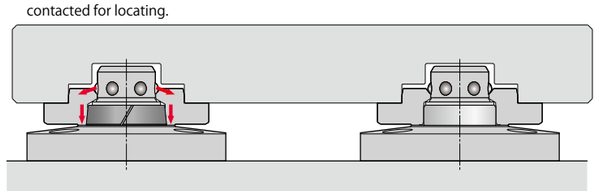
3. As the pallet is further lowered, it is positioned within 0.2mm of the reference axis via the guide sleeve and guide block.



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.

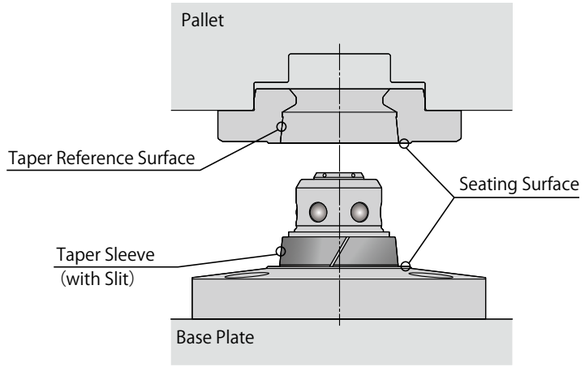


5. When the release pneumatic pressure is OFF and the lock pneumatic pressure is ON, the block is pressed on the seating surface with pneumatic pressure and clamp spring, mechanical lock mechanism. When the block is pressed, the taper reference surface is contacted for locating.



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 movable taper sleeve, the clearance between the clamp unit, taper sleeve and block is eliminated enabling the repetitive location accuracy and stabilized clamping force.

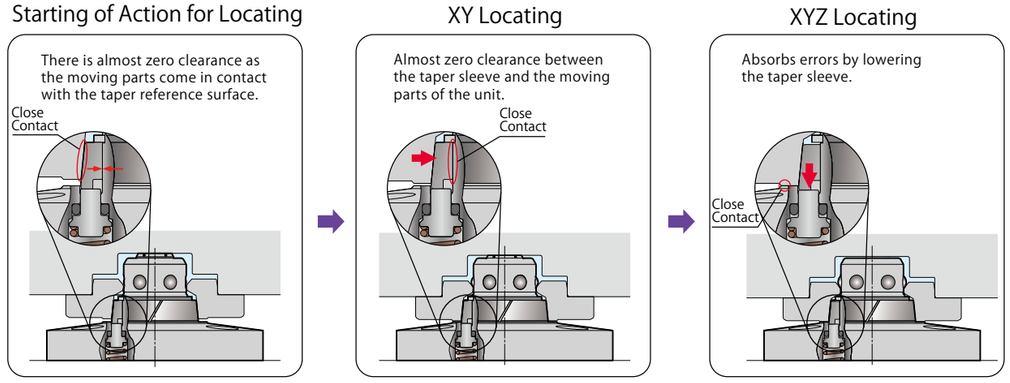
① Absorbs tolerance variations in each location clamp and block.

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.

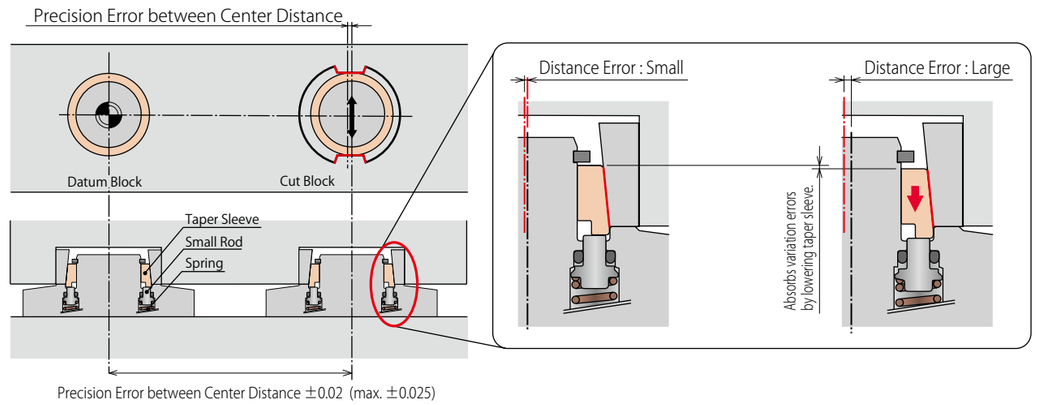
Movement and Error Absorbed by the Movable Taper Sleeve (①/②)



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.



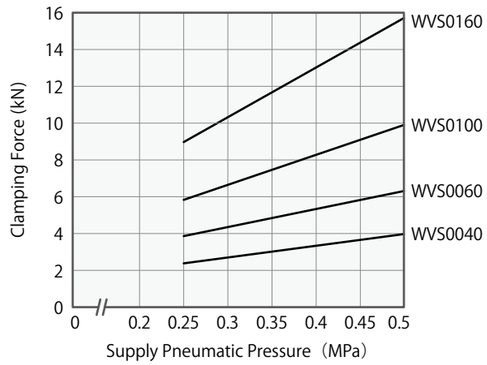
Model No. Indication (Clamp)

WVS 0 06 0 - M D

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.

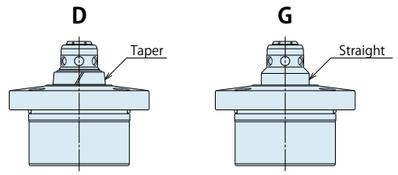


2 Design No.

0 : Revision Number

3 Functions

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



Datum Clamp Guide Clamp

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 the following [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 (Material : SCM)	VSB020 VSJ020	VSB060 VSJ060	VSB100 VSJ100	VSB160 VSJ160
(Hydraulic Clamp Model No.)	(VS0040) (VT0040)	(VS0060) (VT0060)	(VS0100) (VT0100)	(VS0160) (VT0160)

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

Model No. Indication (Block)

VSB : Embedded Block

VSB 06 0 - D

1 2 3 4

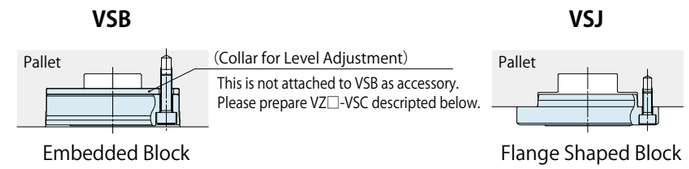
VSJ : Flange Shaped Block

VSJ 06 0 - D

1 2 3 4

1 Shape of Block

VSB : Embedded Block
VSJ : Flange Shaped Block



Embedded Block 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
1. 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 VSB's embedded block.

VZ 0 06 0 - VSC

1 2

1 Accommodate VSB Block Model No.

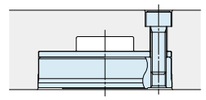
02 : VSB020-□
06 : VSB060-□
10 : VSB100-□
16 : VSB160-□

2 Design No.

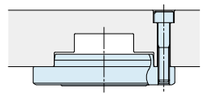
0 : Revision Number

Other Mounting Examples (Reference)

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

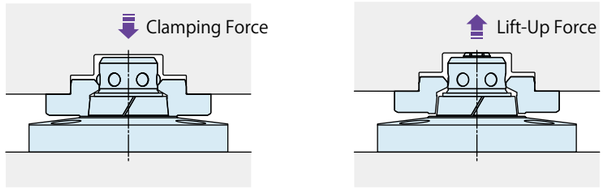


VSB Block: Bolt Mounting from the Upper Side



VSJ Block: Bolt Mounting from the Upper Side

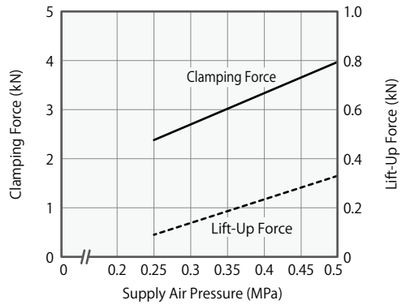
Clamping Force / Lift-Up Force



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

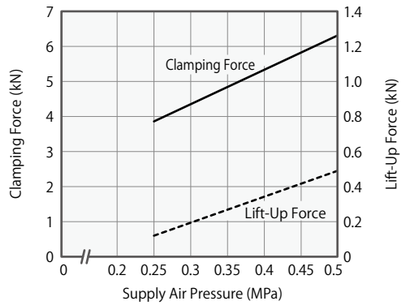
WVS0040-M□

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	



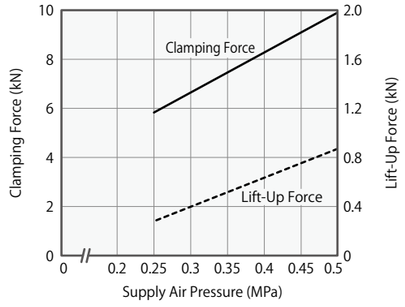
WVS0060-M□

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	



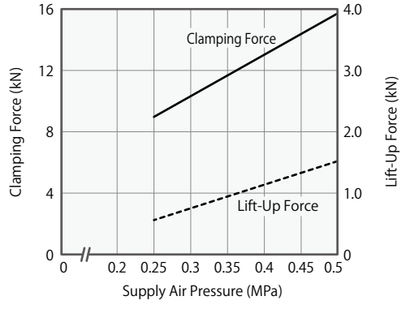
WVS0100-M□

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).

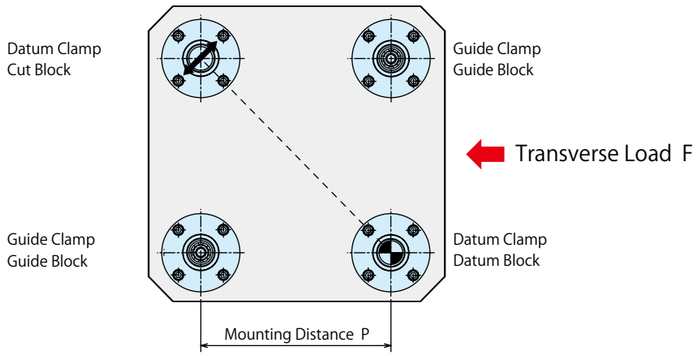
※1. It shows holding force at 0MPa air pressure and does not satisfy specifications.

MEMO

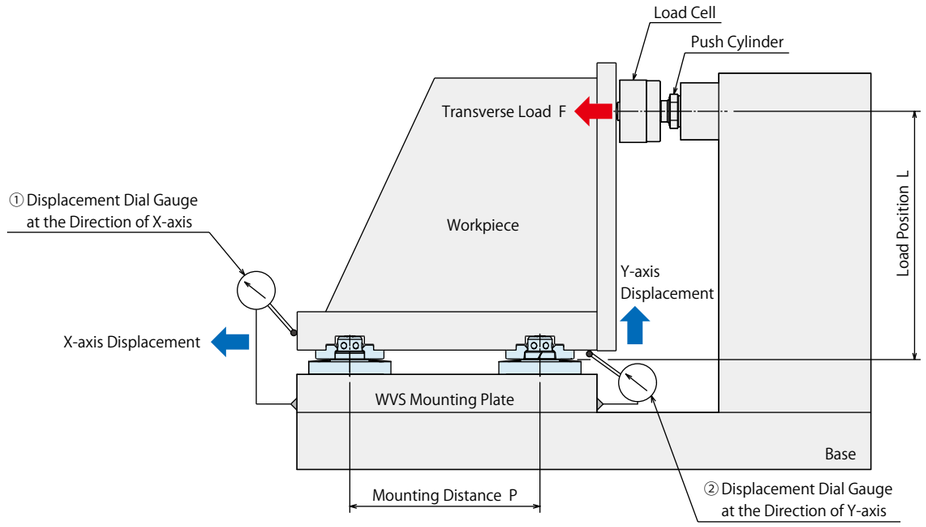
Displacement against Transverse Load

※ 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

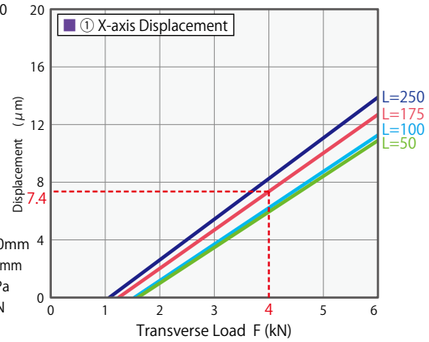


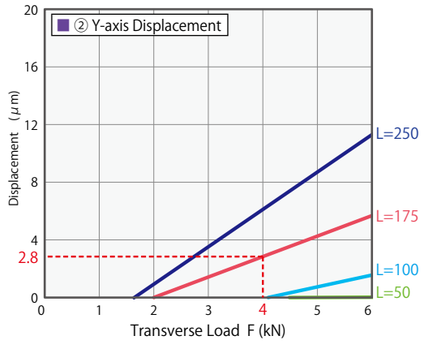
How to Read Displacement

(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.

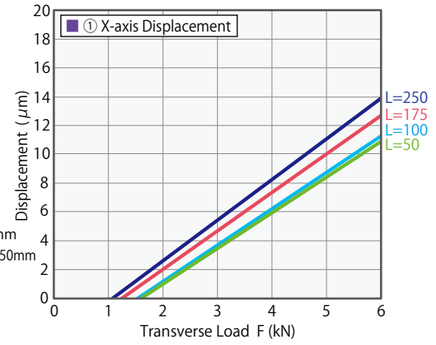
Note
1. Please contact us in case the conditions are different.

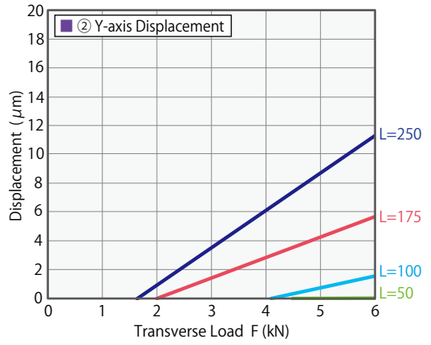
WVS0040

■ 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)



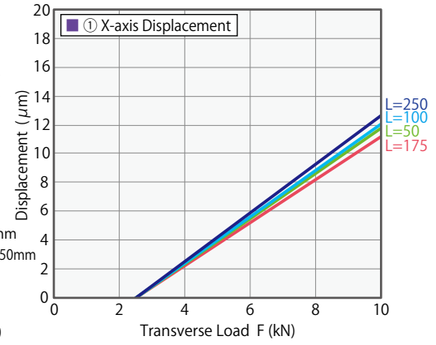


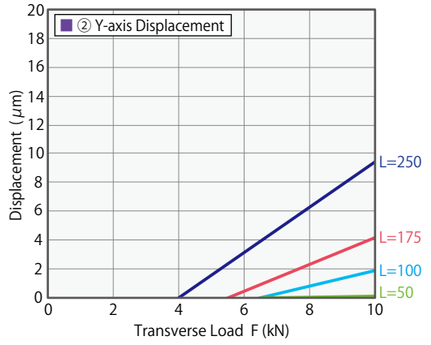
WVS0060

■ 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)



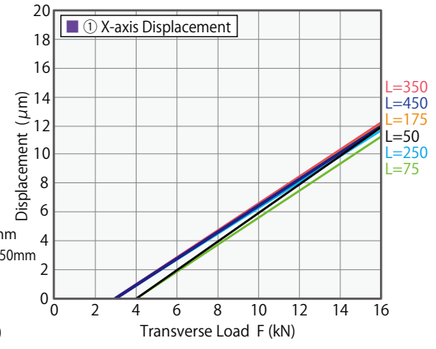


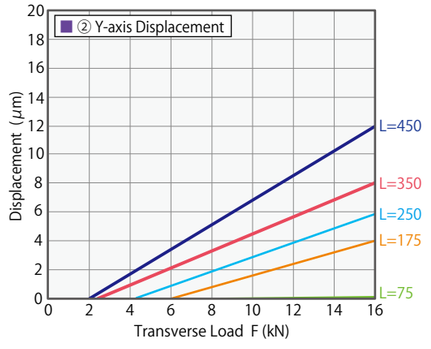
WVS0100

■ 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)



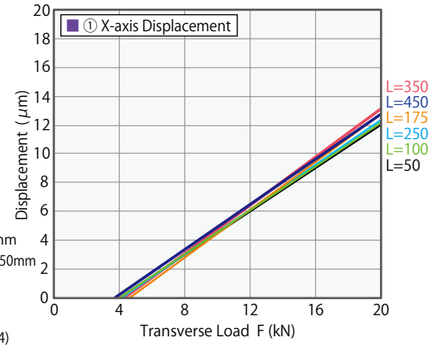


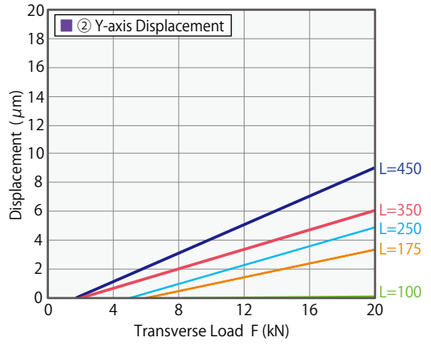
WVS0160

■ 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

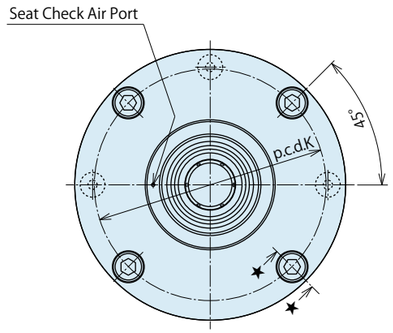
■ Clamping Force
Total 62.8kN (15.7kN×4)

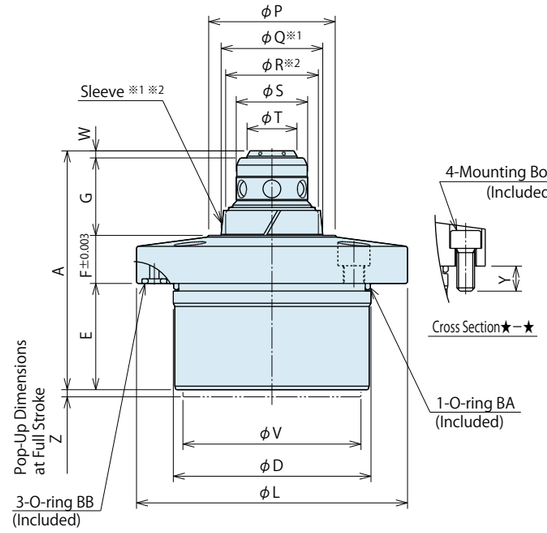




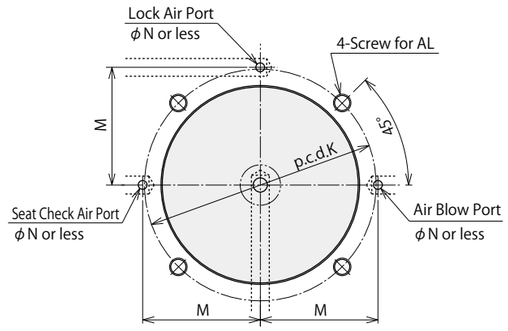
External Dimensions

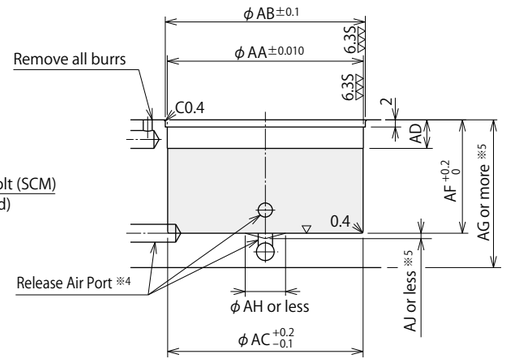
※This drawing shows the release state of WVS.



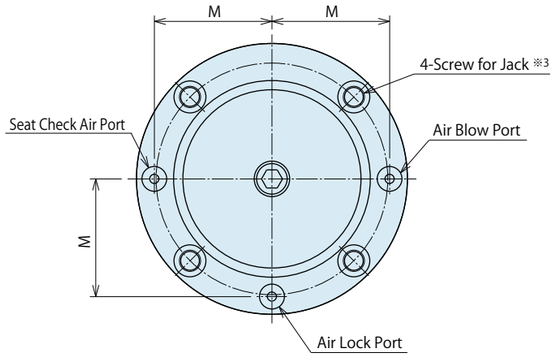


Machining Dimensions of Mounting Area



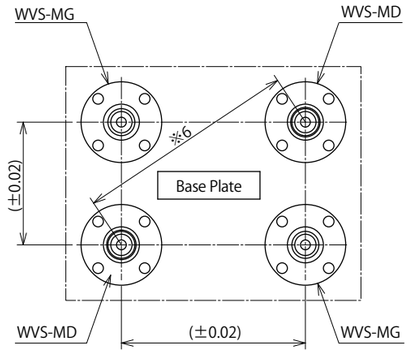


Notes
1. Make sure no burrs are on or around the hole intersection.
※4. The release air port is within ▭ range.
※5. The base thickness (AG) and remaining depth after boring (AJ) are reference values when the base material is S50C.



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.94 for usage.)

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		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	℃	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.

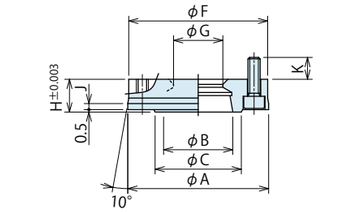
External Dimensions and Machining Dimensions for Mounting

(mm)

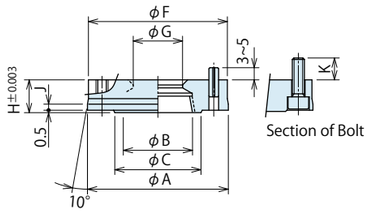
Model		WVS0040-M□	WVS0060-M□	WVS0100-M□	WVS0160-M□
A		65.7	67.2	78.2	90.2
D	WVS-MD	45 +0.030 +0.011	55 +0.030 +0.011	69 +0.030 +0.011	87.5 +0.030 +0.011
	WVS-MG	45 0 −0.020	55 0 −0.020	69 0 −0.020	87.5 0 −0.020
E		30	30	34	39
F		12	13.5	16	20
G		21.7	21.7	26.5	29.5
K		55	65	81	102.5
L		66	76	94	118.5
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 (Nominal×Pitch×Depth)		M5×0.8×10	M5×0.8×10	M6×1×10	M8×1×14
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

External Dimensions

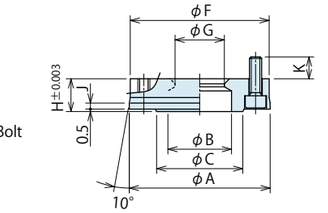
VSB020/060/100/160-D



VSB020/060/100/160-C



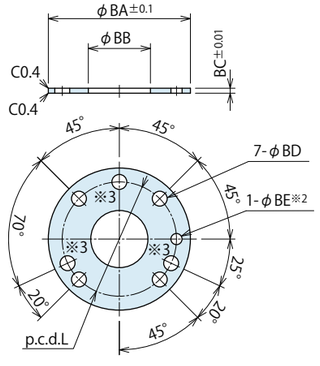
VSB020/060/100/160-G/F



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.

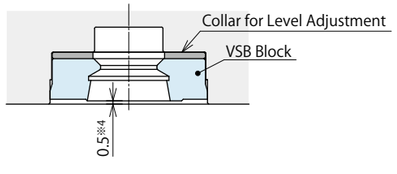
Dimensions of Collar for Level Adjustment

VZ0020/0060/0100/0160-VSC



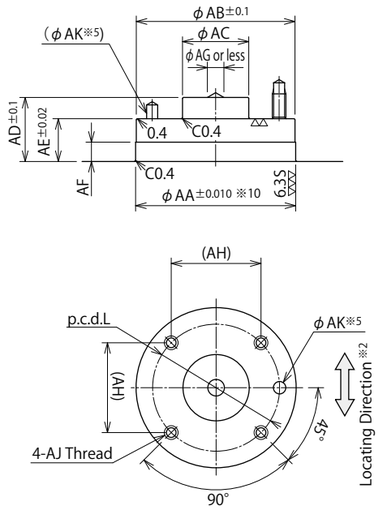
Notes
1. Please refer to the drawing above in case the collar for level adjustment is prepared by yourself.
※3. The screw for jack is used when VSB block is removed.

※Mounting of Collar for Level Adjustment.



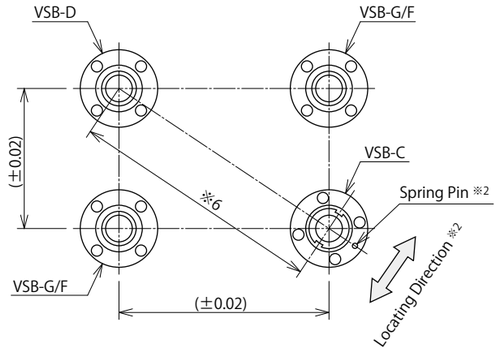
※4. Clearance between the seating area of VSB block and block bottom.

Machining Dimensions of Mounting Area

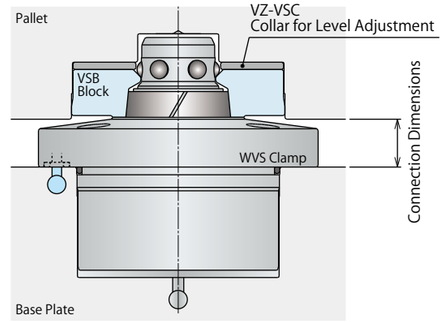


Notes
1. This graph shows the case where the clearance between the seating area of VSB block and pallet bottom is 0.5mm when the collar for level adjustment is used.
※5. ϕAK hole is used for phasing of VSB-C positioning direction. Please make sure is ϕAK hole is at the line connecting the centers of 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 ±0.025mm between the blocks with the longest distance.

External Dimensions and Machining Dimensions for Mounting

(mm)

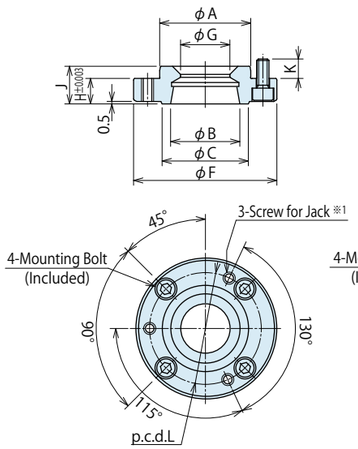
Model No.	VSB020-D VSB020-C	VSB020-G VSB020-F	VSB060-D VSB060-C	VSB060-G VSB060-F	VSB100-D VSB100-C	VSB100-G VSB100-F	VSB160-D VSB160-C	VSB160-G VSB160-F
A	50 +0.027 +0.011	50g7 -0.009 -0.034	58m6 +0.030 +0.011	58g7 -0.010 -0.040	70m6 +0.030 +0.011	70g7 -0.010 -0.040	83m6 +0.035 +0.013	83g7 -0.012 -0.047
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 (Nominal×Pitch×Depth)	M4×0.7×7		M5×0.8×8		M6×1×10		M8×1.25×14.5	
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 VS0020-MD VS/VT0040-MD	WVS0040-MG WVS0040-MD※9 VS0020-MG VS/VT0040-MG VS0020-MD※9 VS/VT0040-MD	WVS0060-MD VS/VT0060-MD	WVS0060-MG WVS0060-MD※9 VS/VT0060-MG VS/VT0060-MD※9	WVS0100-MD VS/VT0100-MD	WVS0100-MG WVS0100-MD※9 VS/VT0100-MG VS/VT0100-MD※9	WVS0160-MD VS/VT0160-MD	WVS0160-MG WVS0160-MD※9 VS/VT0160-MG VS/VT0160-MD※9
Connection Dimensions WVS/VS When Lock	11.5		13		15.5		19.5	
Connection Dimensions 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

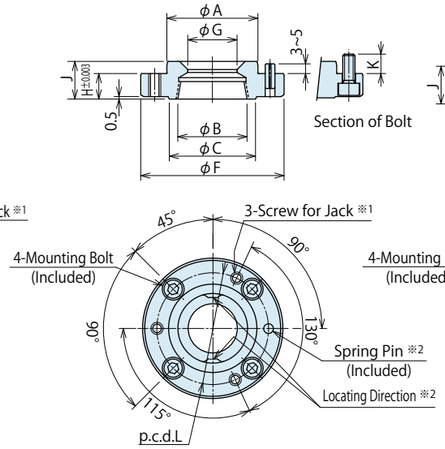
Notes
※ 7. The dimensions in ( ) display that of VSB-F.
※ 8. The spring pin is included only in VSB-C.
※ 9. The guide block (VSB-G) is used only for guide clamp (WVS-G) and the free block (VSB-F) can be used for both datum clamp (WVS-D) and guide clamp (WVS-G).
※10. Pallet with low rigidity (thin pallet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

External Dimensions

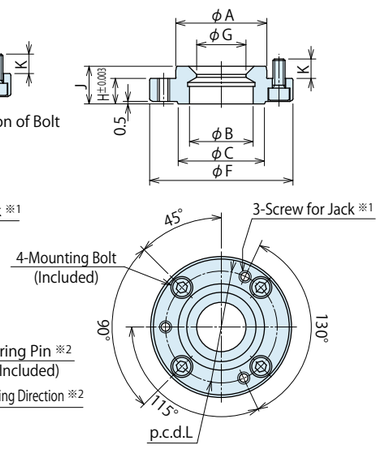
VSJ020/060-D



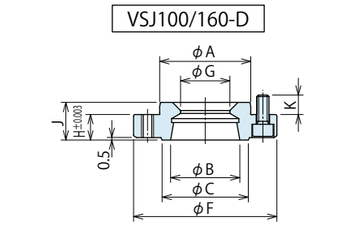
VSJ020/060-C



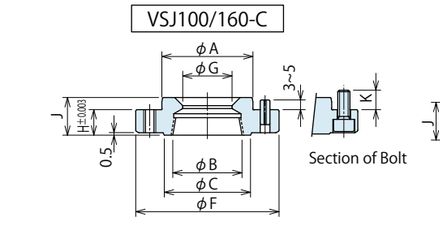
VSJ020/060-G
VSJ020/060-F



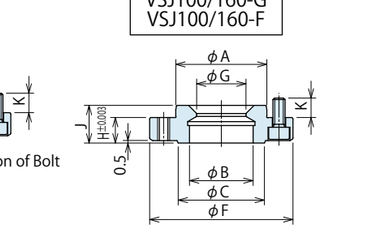
VSJ100/160-D

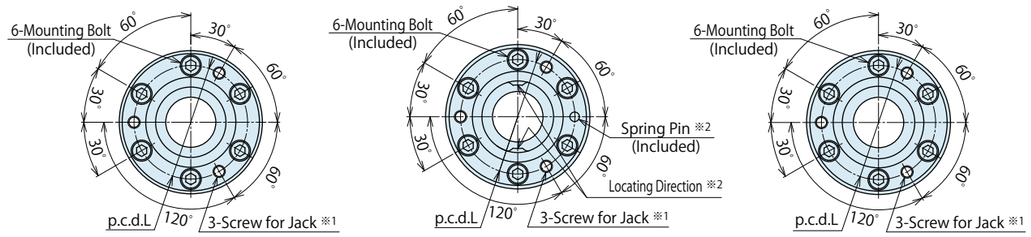


VSJ100/160-C



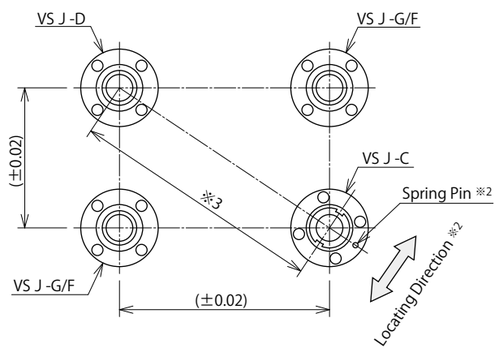
VSJ100/160-G
VSJ100/160-F



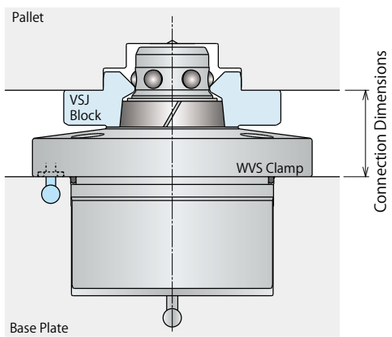


Notes
※1. The screw for jack is used when VSJ block is removed.
※2. The spring pin is used for phasing of VSJ-C locating direction.

Mounting Distance Accuracy and VSJ-C Phase



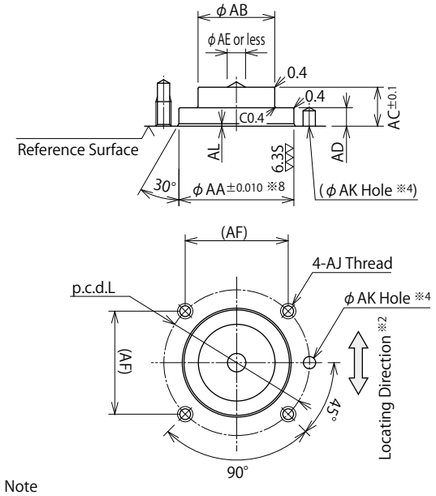
Connection Dimensions



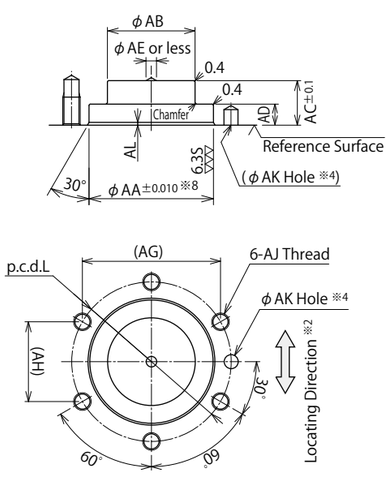
Note
※3. Please make sure the precision between block pitches is within ±0.025mm between the blocks with the longest distance.

Machining Dimensions of Mounting Area

VSJ020/060



VSJ100/160



Note
※4. ϕAK hole is used for phasing of VSJ-C locating direction.
Please make sure ϕAK hole is at the line connecting the centers of VSJ-D and VSJ-C. This machining is only necessary for VSJ-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 (Nominal×Pitch×Depth)	M4×0.7×8		M5×0.8×9		M5×0.8×9		M6×1×10	
AK	ϕ3.4 Depth 5	–	ϕ4.5 Depth 5	–	ϕ4.5 Depth 5	–	ϕ4.5 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	ϕ3×10	–	ϕ4×10	–	ϕ4×10	–	ϕ4×10	–
Mass	0.1kg		0.18kg		0.3kg		0.55kg	
Appropriate Clamp	WVS0040-MD VS0020-MD VS/VT0040-MD	WVS0040-MG ※7 WVS0040-MD ※7 VS0020-MG VS/VT0040-MG VS0020-MD ※7 VS/VT0040-MD	WVS0060-MD VS/VT0060-MD	WVS0060-MG ※7 WVS0060-MD ※7 VS/VT0060-MG VS/VT0060-MD ※7	WVS0100-MD VS/VT0100-MD	WVS0100-MG ※7 WVS0100-MD ※7 VS/VT0100-MG VS/VT0100-MD ※7	WVS0160-MD VS/VT0160-MD	WVS0160-MG ※7 WVS0160-MD ※7 VS/VT0160-MG VS/VT0160-MD ※7
Connection Dimensions WVS/VS When Lock	20		23.5		26		32	
Connection Dimensions WVS/VS When Release	21		24.5		27		33	

Notes
※5. The dimensions in ( ) display that of VSJ-F.
※6. The spring pin is included only in VSJ-C.
※7. The guide block (VSJ-G) is used only for guide clamp (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 VSBJ block.
In this case, tolerance of mounting hole machining dimension AA±0.010 should be close to +0.010 (the upper limit of the tolerance).

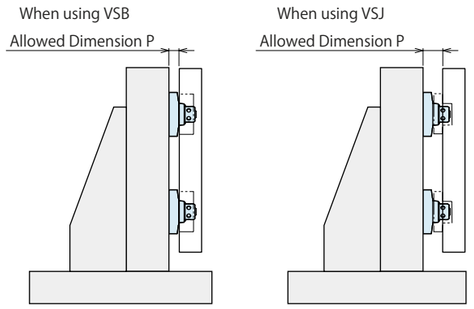
Cautions

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 φ6mm.

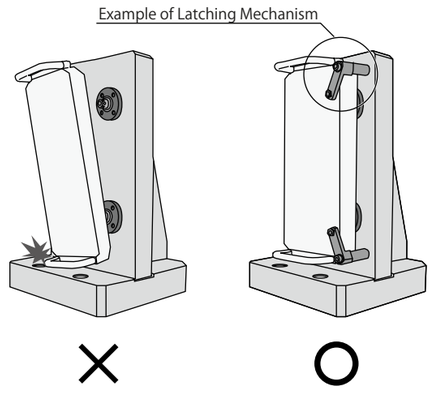
3) When the pallet is in vertical position.
- When the workpiece fixture plate is being set, make sure it is in proper proximity and square to the clamps. If it is locked out of position, the machine or clamps may be damaged.



Allowed Dimension P (mm)

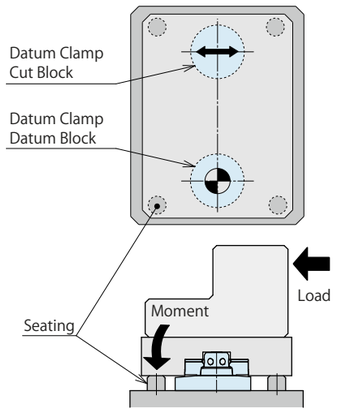
Model No.	WVS0040	WVS0060	WVS0100	WVS0160
VSB Block	13	14.5	17	21
VSJ Block	21.5	25	27.5	33.5

- 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.

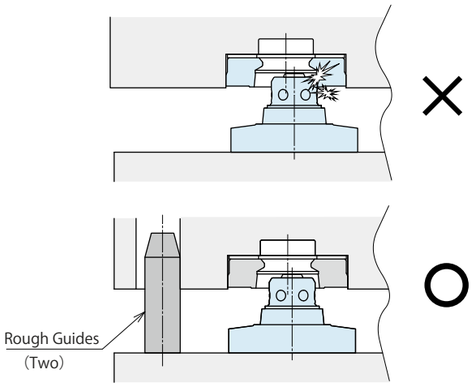


- When the pallet is in horizontal position (leveled), make sure the weight of the workpiece fixture is less than the lift force of the clamps and maximum load of the machine.
- When the pallet is in vertical position, make sure the weight of workpiece fixture pallet is 10% of the clamping force.
- Please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

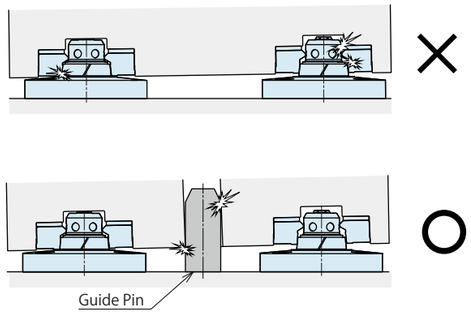
4) Seat Setting
- In case the clamp/block configuration is linear, it is recommended to provide additional supports for stability.



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.

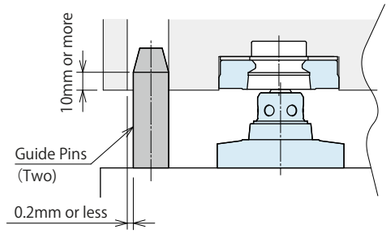


- The pallet must be level when lowering or lifting from the pallet clamps.If necessary, provide guide pins to keep the pallet level during loading and unloading.



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.

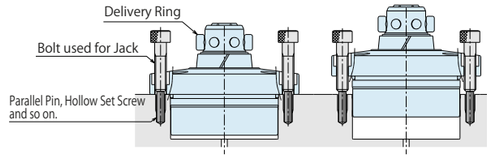
2) Procedure before Piping
- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with this product for prevention of contaminants in the air circuit.

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.

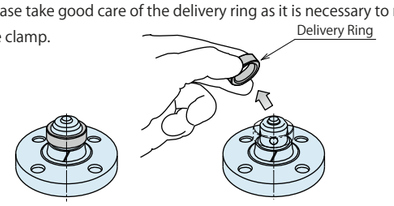
4) Mounting the body
- When mounting the product use all hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tighten them evenly to prevent twisting or jamming.

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

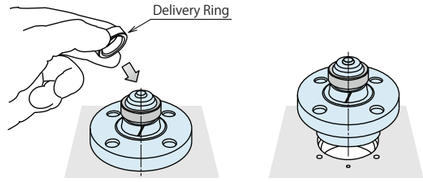
5) Removal
- Mount the delivery ring.
- Remove mounting bolts. Insert jack bolts and tighten evenly to lift clamp.
- Protect the screw parts with parallel pins as shown in the graph below in order for the bolts used for jack not to damage the surface of mounting screws.



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

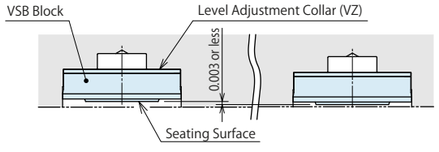


- When the pallet clamp is removed from the fixture, mount the delivery ring in advance. In case it is removed without using of the delivery ring, the internal parts may be separated from the spring, which cannot be recovered.



7) Level Adjustment of 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 ±0.003mm)

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.363 for common cautions. ・Notes on Handling ・Maintenance/Inspection ・Warranty