Pneumatic Location Clamp

Model **SWT**

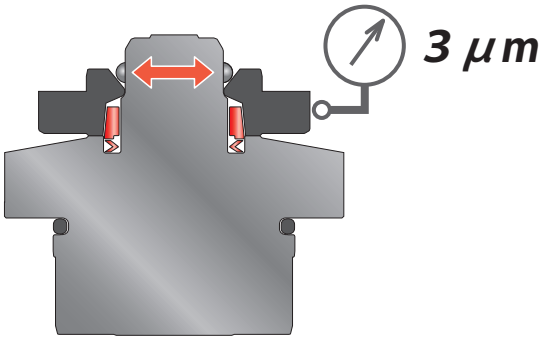
Locates and Clamps Simultaneously

Locating Repeatability：3 μm　All Stainless Steel

PAT.

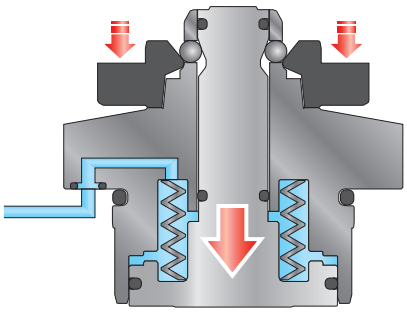
● Repetitive Locating with High Accuracy

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.

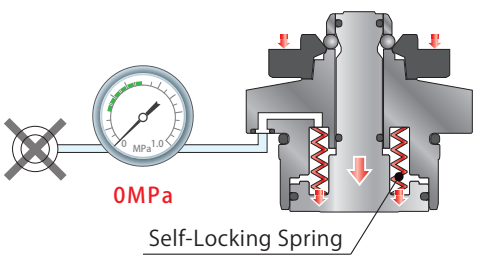


● Self Lock (Safety) Function (Holding Force at zero pneumatic pressure)

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.

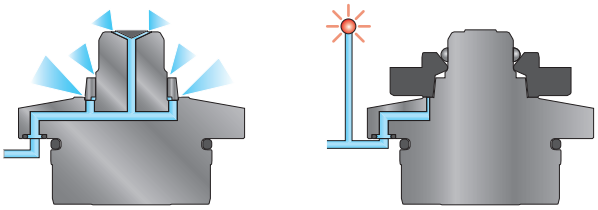
※ For locating more than the minimum operating air pressure is required.

Maintains clamped state.



● Air Blow and Seat Check

Contaminants are removed by air blow.
Seating surface is provided with the air hole, seat check is possible with a gap sensor.

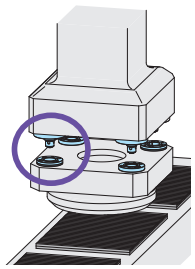


Air Blow　　***Seat Check***

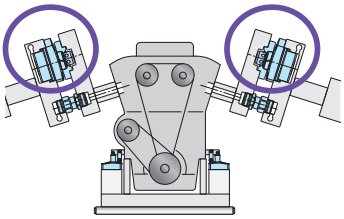
Advantages

● Setup Improvement Enhances Productivity

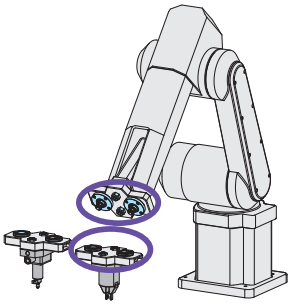
Pneumatic locating clamp locates with high accuracy and clamps simultaneously. (Fixture alignment and inspection are eliminated.) Fixture changeover becomes faster and easier, thus by eliminating alignment inspection for accuracy which is done in many different ways.



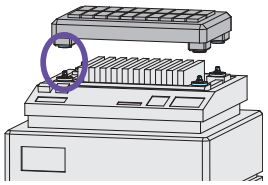
<Production Line of LCD Panels>



<Engine Test Device>



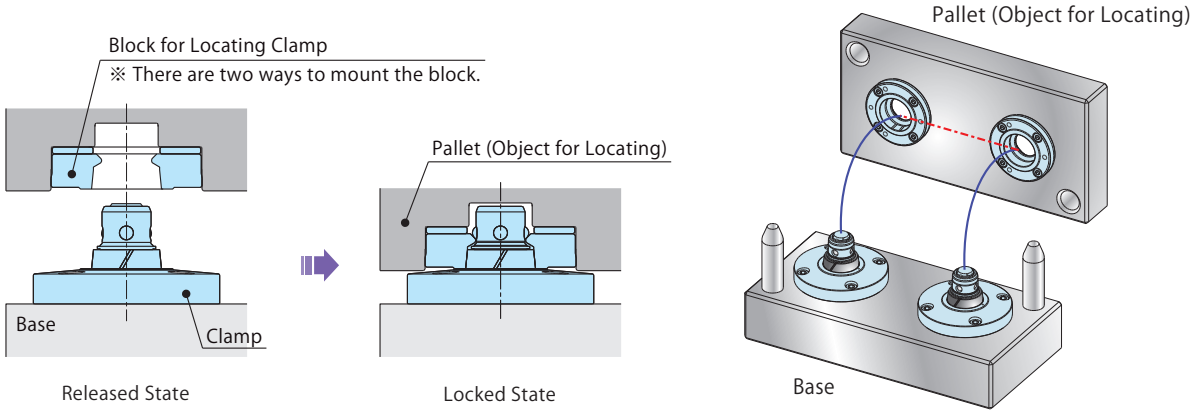
<Robotic Tool Changers>

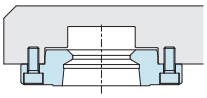
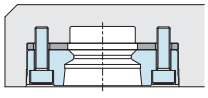


<Semiconductor Inspection Device>

Application Examples

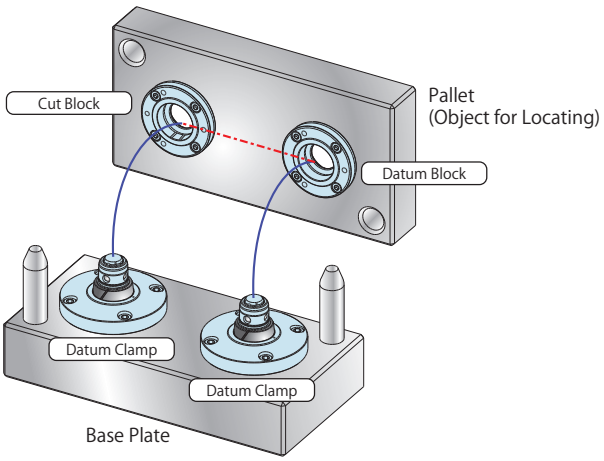
※ Refer to P.103 for detailed action description.



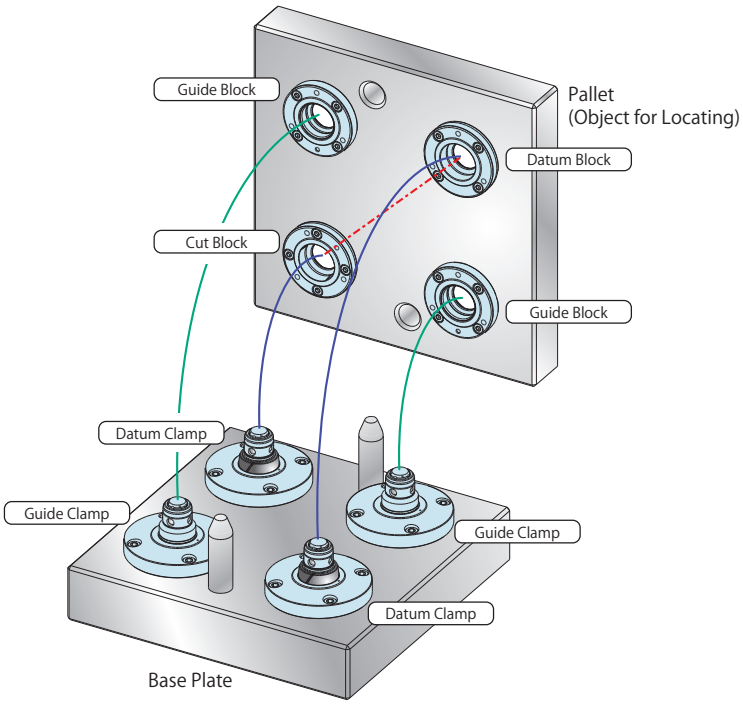
	 Model SWT → P.113	 Model SWTJ → P.117	 Model SWTB → P.115
Classification	Double Action Air Lock / Air Release	Flange Shaped Block	Embedded Block
Operating Pressure Range	0.35 ~ 1MPa	–	–
Features	• Clamping force varies according to air pressure. • Self-Lock Function with Spring • Material : Stainless	 • Simple Mounting • Material : Stainless	 • Straight Mounting • Material : Stainless
Accessories	–	–	Level Adjustment Collar (Only for SWTB) Material : Equal to S45C VZ-VSC → P.115

System References

When Using 2 Location Clamps



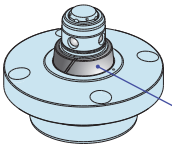
When Using 4 Location Clamps



Products and Functions

※ For the combination of clamps and blocks, please refer to the P.107.

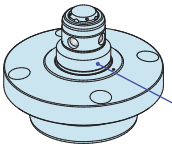
Datum Clamp



With Locating Function

Movable Taper Sleeve

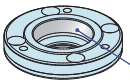
Guide Clamp



No Locating Function

Guide Part (Straight)

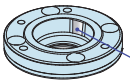
Datum Block



For Reference Plane Direction Locating

Taper Reference Surface (Whole Circumference)

Cut Block

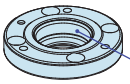


For One Direction Locating

Taper Reference Surface (a part)

※ Only cut block requires attention in the mounting phase. For detail, please refer to the phase of SWT□-C (P.116/P.117).

Guide Block

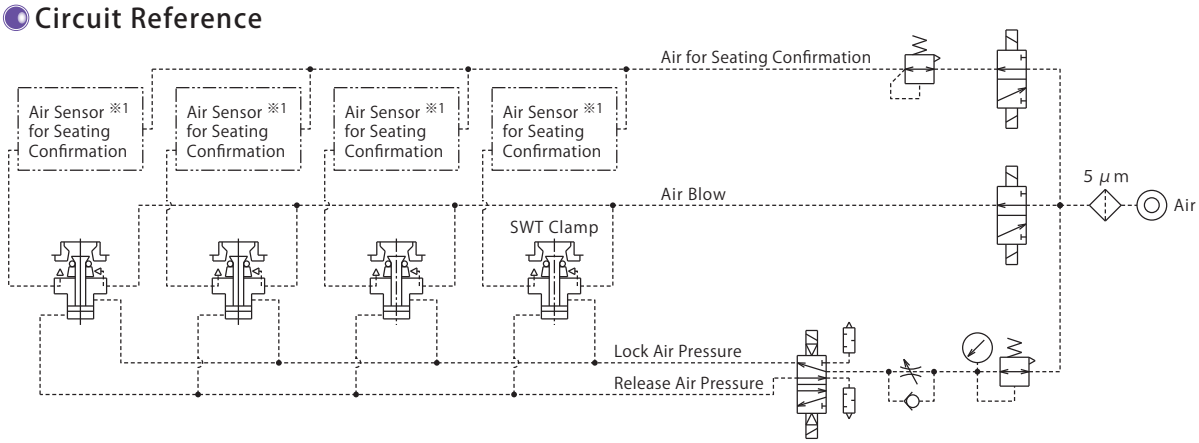


For Guide

Guide Part (Straight)

※ Free block has no guide function.

Circuit Reference



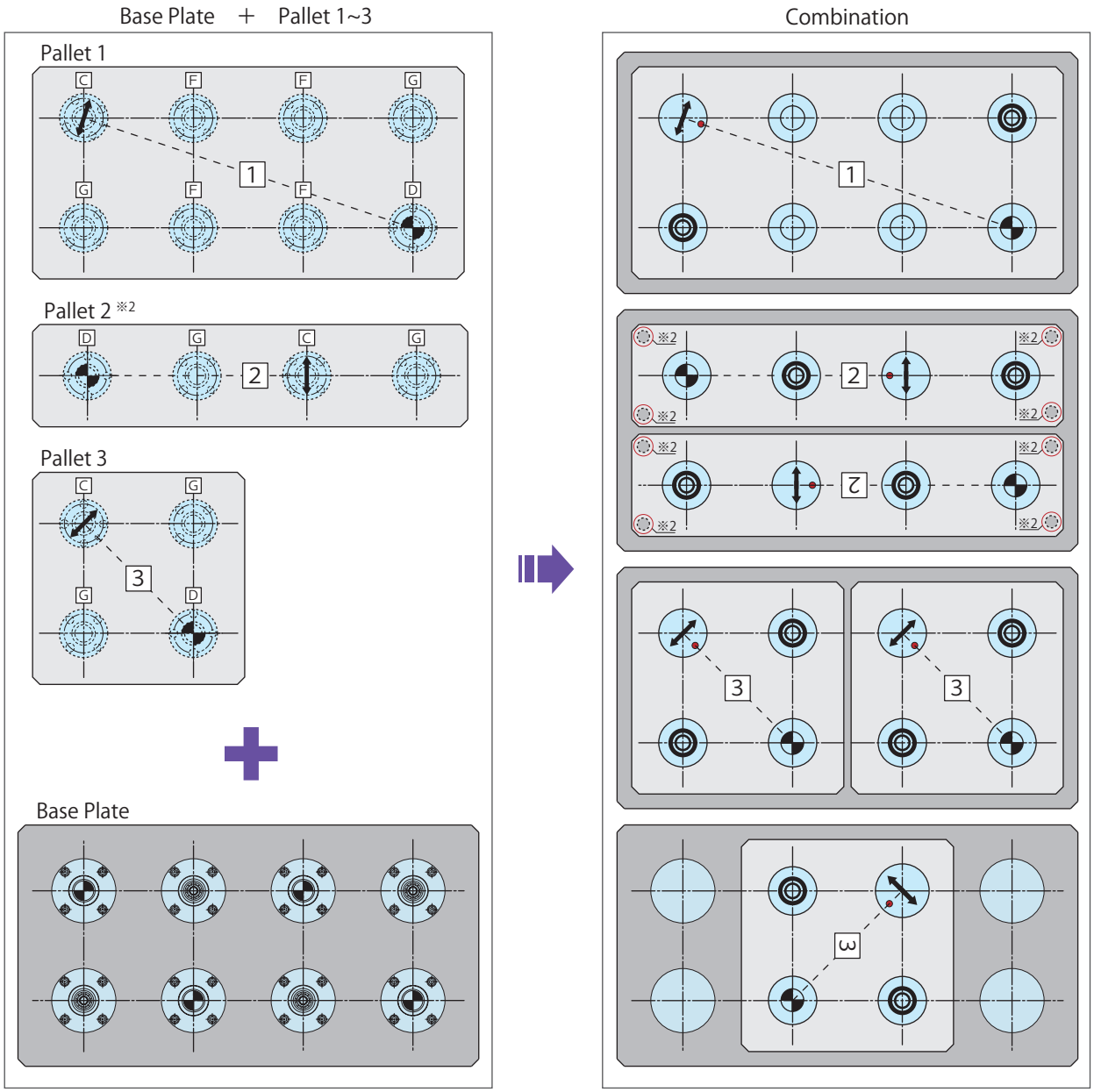
Notes : 1. Air blow passage should be ϕ6 or more for an effective air blow. Please supply filtered clean dry air.

※1. Please refer to the list on the right for recommended air sensors for seating confirmation.

Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA3-G	GPS3-E

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

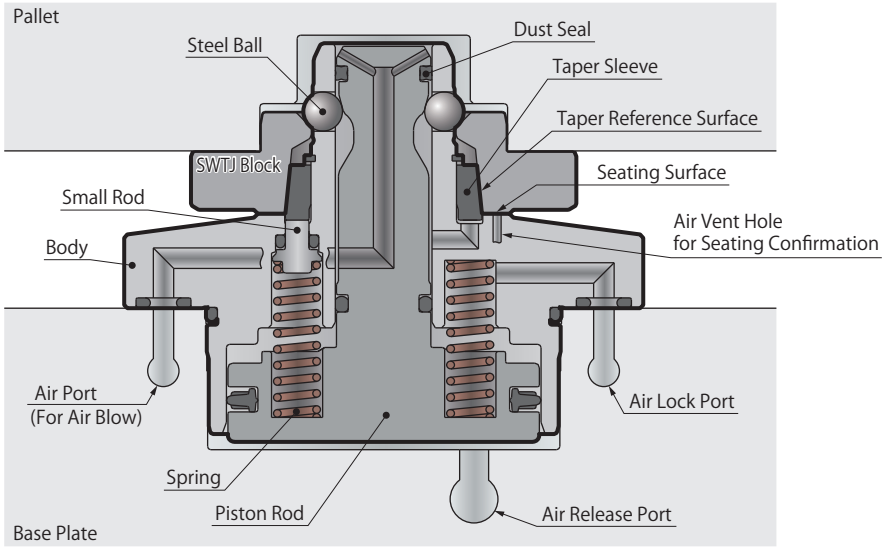
Equipment installed on the base plate		Equipment installed on the pallet		Functions when they are combined
Datum Clamp	+	Datum Block	→	Clamping Function + Locating Function (Reference Point)
Datum Clamp	+	Cut Block ※3	→	Clamping Function + Locating Function (One Direction)
Guide Clamp	+	Guide Block	→	Clamping Function + Guide Function
Datum Clamp or Guide Clamp	+	Free Block	→	Clamping Function

Notes :

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

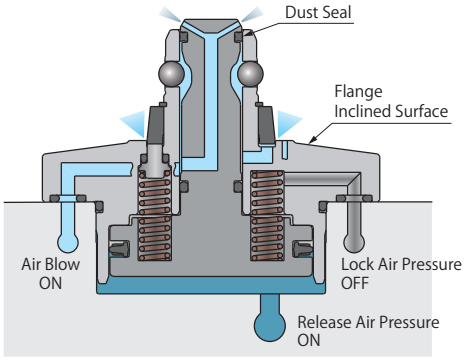
※3. The spring pin position is indicated. With the datum block as reference, unidirectional positioning is done via the cut block.
The cut block positioning plane must be tangent to the datum block.
(The spring pin is positioned on the line connecting the centers of the datum block and cut block.)

Cross Section



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

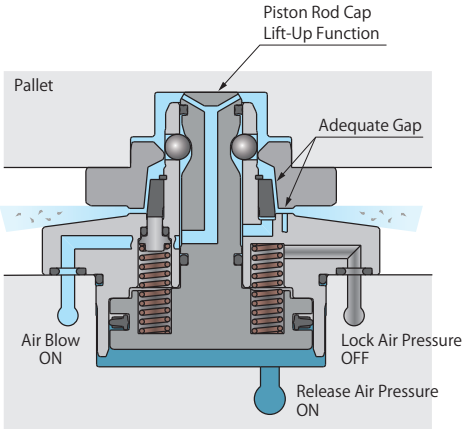
Action Description



Before Loading the Pallet

- Air blow prevents debris contamination.
- Dust seal prevents contamination and keeps the steel ball area clean.
- The flange top is designed as inclined surface so that cutting chips and cutting oil can flow easily.
- The slit of taper sleeve (one place) is protected with rubber plate to prevent invasion of cutting chips.

After Unloading the Pallet



When Loading the Pallet

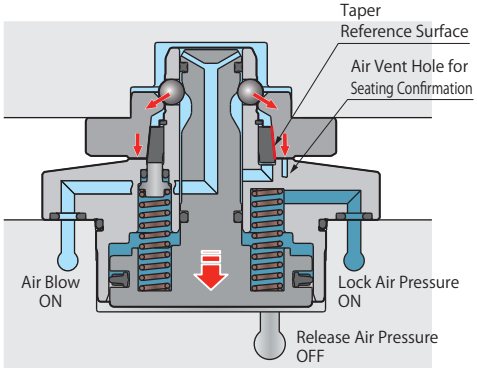
When loading the pallet,

- The pallet is set on the raised piston rod cap.
  At this time, the lift-up function makes an adequate gap between the taper reference surface and the seating surface. This allows to remove cutting chips and fluid effectively, and prevent damage on the clamp during pallet loading.

When unloading the pallet,

- The lift-up force releases the close contact of the taper seating surface and the seating surface.

When Unloading the Pallet



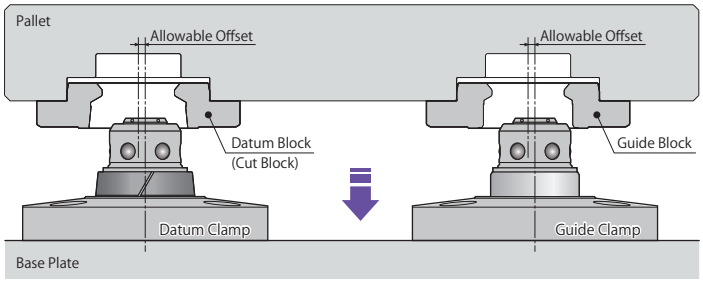
When Clamped

- When release air pressure is OFF and lock air pressure is ON, the air pressure and the spring force lower 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 seating confirmation (via air catch sensor).

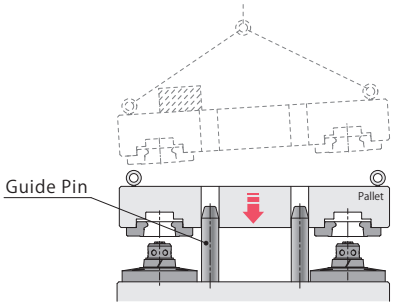
When Clamped

Action Description during Loading/Unloading

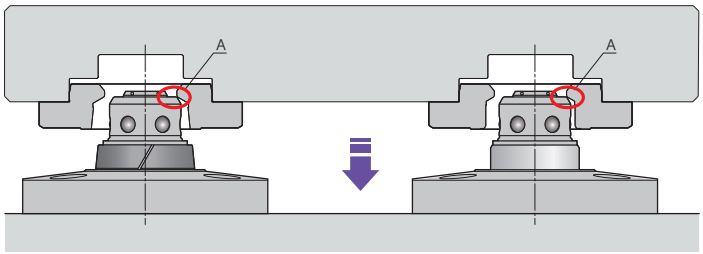
1. Air pressure releases the clamp. Position of pallet while loading must be kept within the offset tolerance. Continuously supply air pressure to the air blow port.



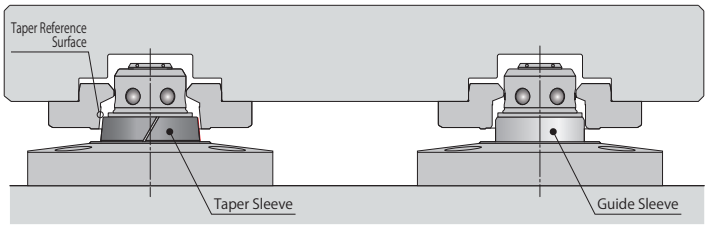
The fixture pallet must be level when lowering or lifting from the pallet clamps. If necessary, provide guide pins (rough guide) to keep the pallet level during loading and unloading.



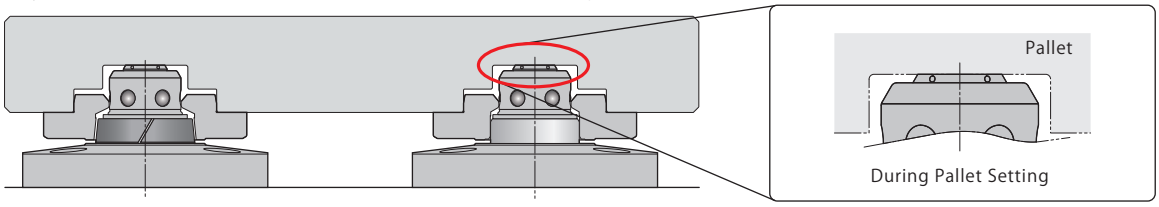
2. When the pallet is lowered, it should be positioned so the blocks contact the rod as shown on A.



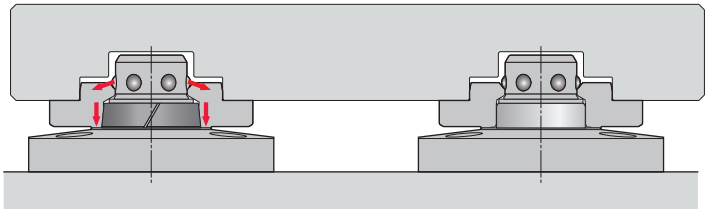
3. As the pallet is further lowered, it is positioned within 0.2mm of the reference axis by the guide sleeve and guide block. (Guide Function) The guide function prevents interference by allowing a gap between the datum clamp and taper reference surface.



4. Pallet setting is completed when the pallet rests on the piston rod. At this time, there is appropriate clearance between the taper reference surface and seating surface created by lift up function, which makes air blow more effective to remove cutting chips and fluid.

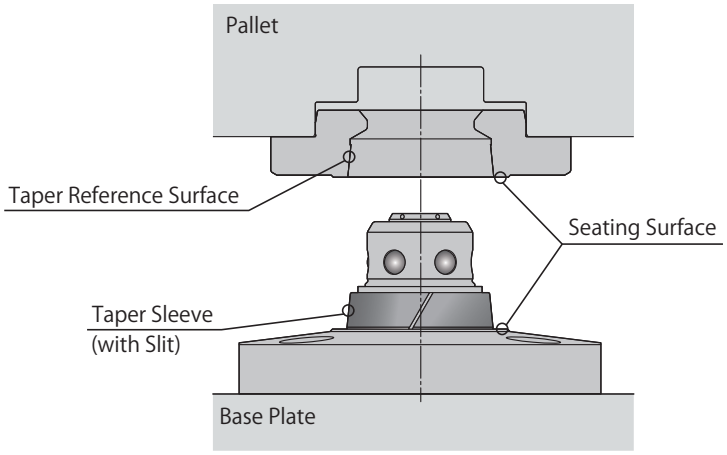


5. When release air pressure is OFF and lock air pressure is ON, the block is pressed onto the seating surface with air pressure, spring force and mechanical lock. As the block is pressed, the taper reference surface is contacted for locating.



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.

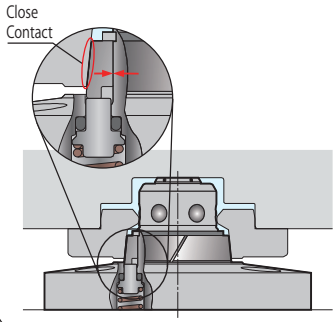
③ Absorbs space variations of mounting holes.

④ Absorbs space variations due to temperature change.

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

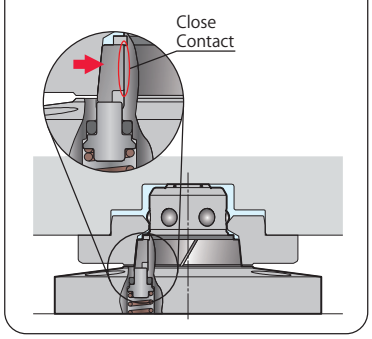
Starting of Action for Locating

There is almost zero clearance as the moving parts come in contact with the taper reference surface.



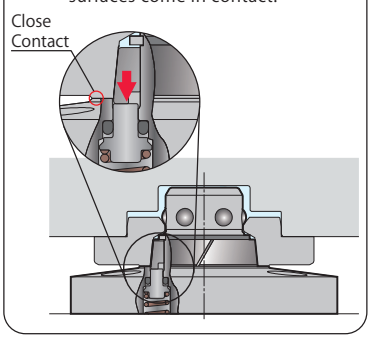
XY Locating

Clearance between the taper sleeve and the body is completely zero.



XYZ Locating

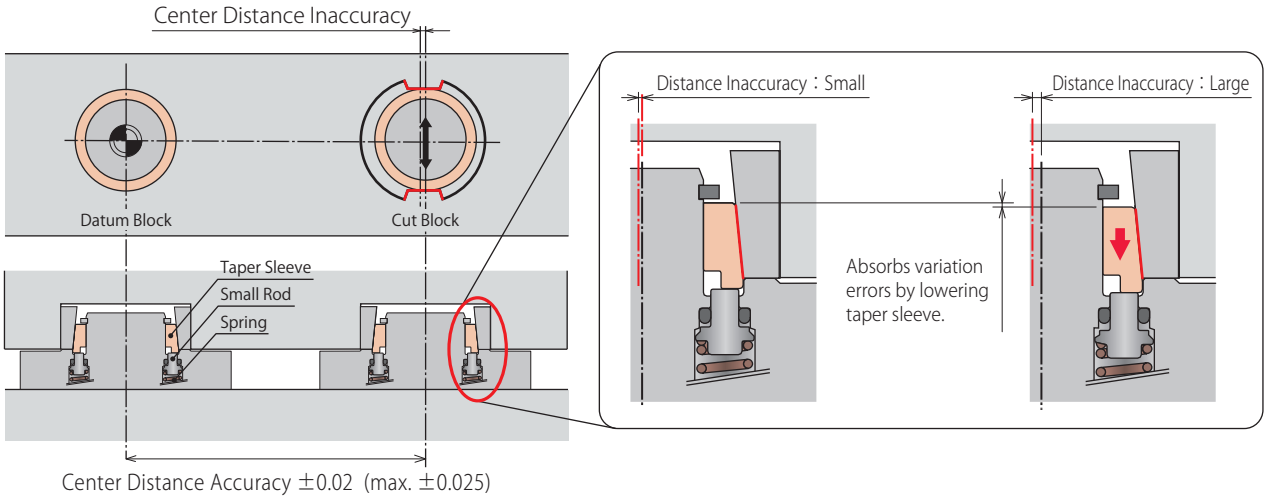
Absorbs errors by lowering the taper sleeve, and seating surfaces come in contact.



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)

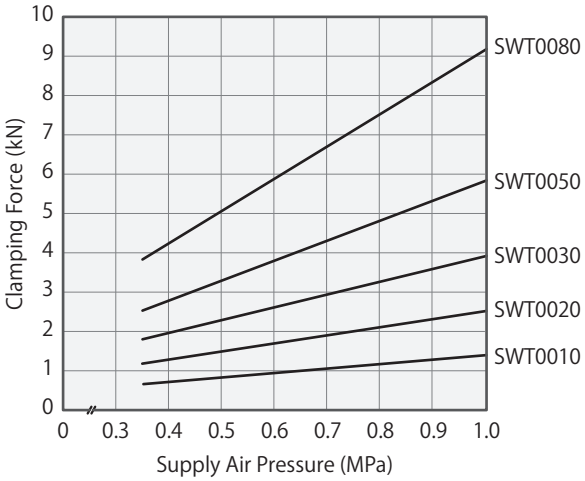
SWT 0 03 0 - M D

1 2 3

1 Clamping Force

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

※ See the clamping force curve on the right side. Refer to Performance Curve and Specification for details.

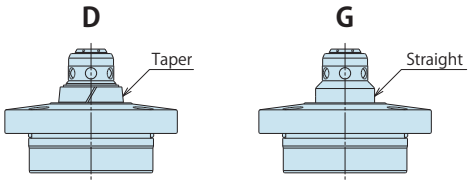


2 Design No.

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：Stainless Steel)	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

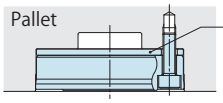
SWTJ：Flange Shaped Block

SWTJ 03 0 - D
1 2 3 4

1 Shape of Block

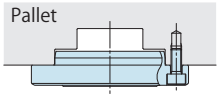
SWTB ： Embedded Block
SWTJ ： Flange Shaped Block

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 Collar)

※ 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.

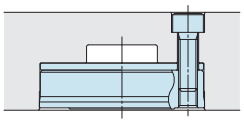
01：SWTB010-□
02：SWTB020-□
06：SWTB030-□
10：SWTB050-□
16：SWTB080-□

2 Design No.

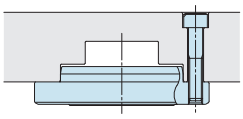
0 ：Revision Number

Other Mounting Examples (Reference)

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

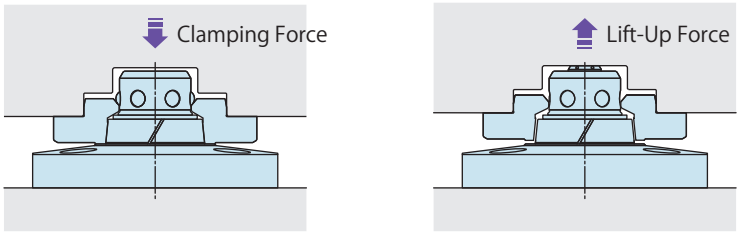


SWTB Block：Bolt Mounting from the Upper Side



SWTJ Block：Bolt Mounting from the Upper Side

Clamping Force / Lift-Up Force



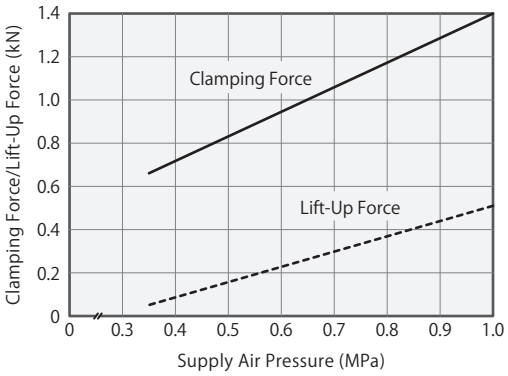
Notes :

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.

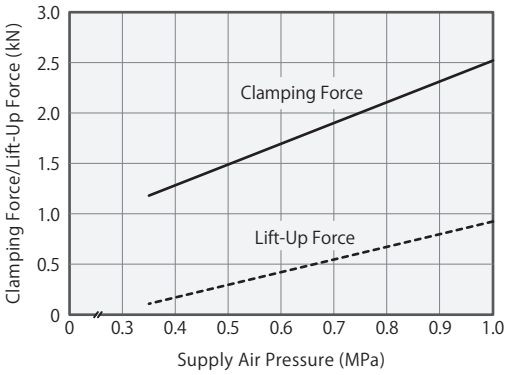
SWT0010-M□

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	



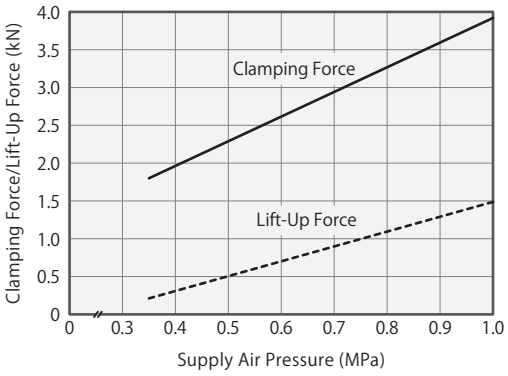
SWT0020-M□

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	



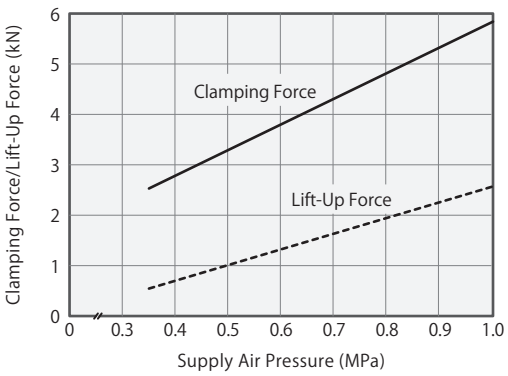
SWT0030-M□

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	



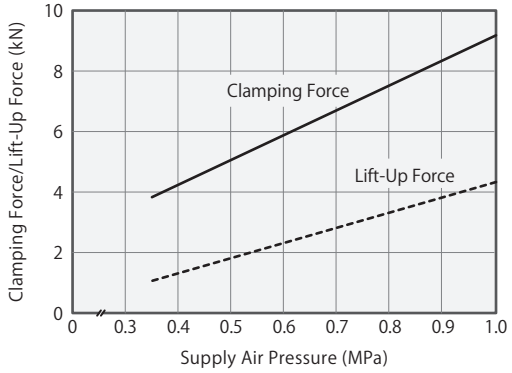
SWT0050-M□

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	

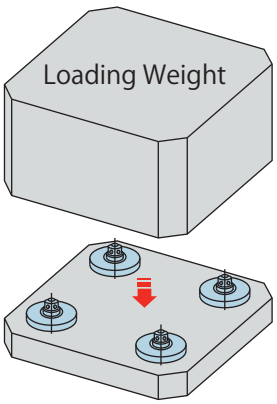


SWT0080-M□

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.

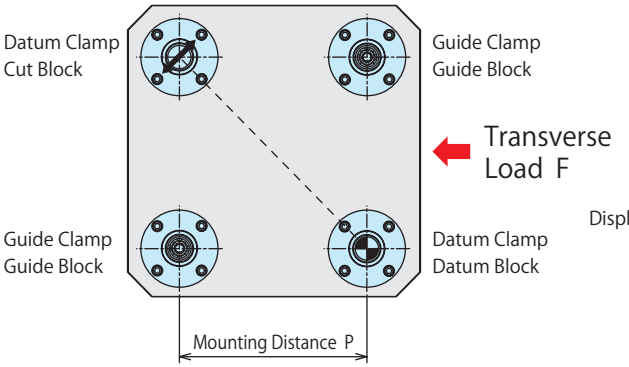
Model No.		SWT0010-M□	SWT0020-M□	SWT0030-M□	SWT0050-M□	SWT0080-M□
Maximum Loading Weight ※2	kg	200	400	600	800	1200

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.121.

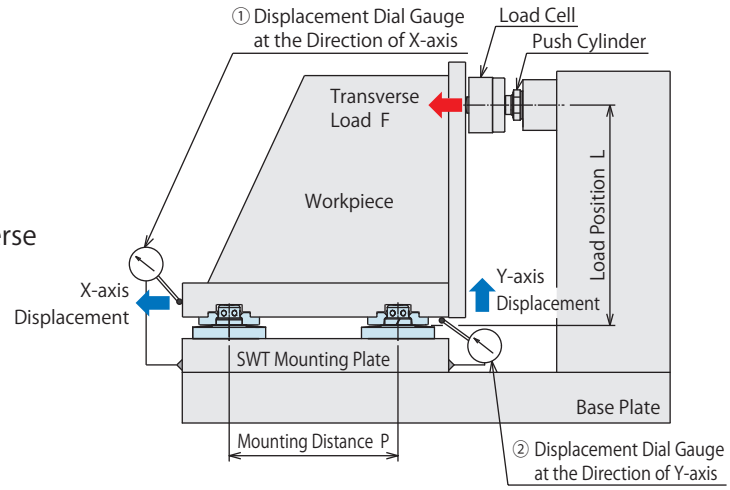
Displacement against Transverse Load

※ 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

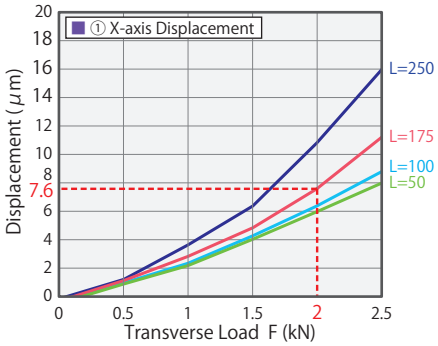
(Ex.) In case of SWT0010

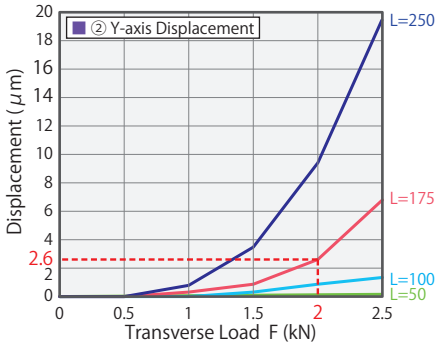
■ Components
【Clamp】
SWT0010-MD×2 Units
SWT0010-MG×2 Units
【Block】
SWTJ010-D×1 Unit
SWTJ010-C×1 Unit
SWTJ010-G×2 Units

■ 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.





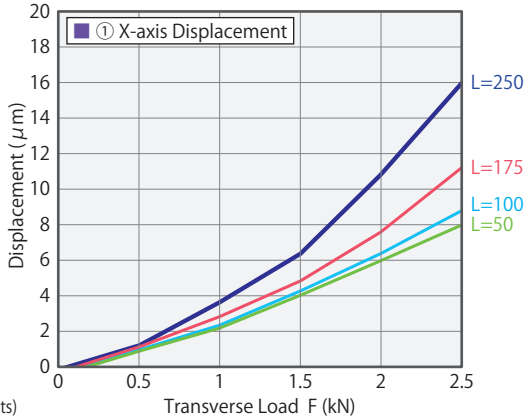
Note :
1. Please contact us in case the conditions are different.

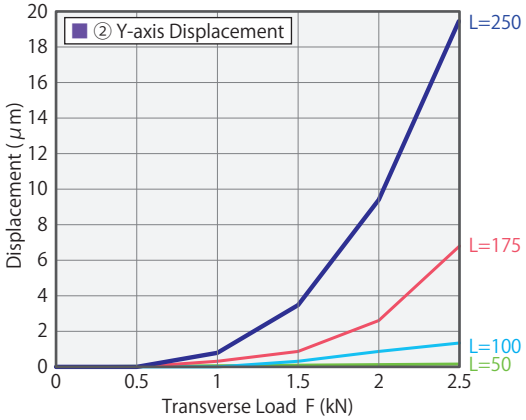
SWT0010

■ 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)



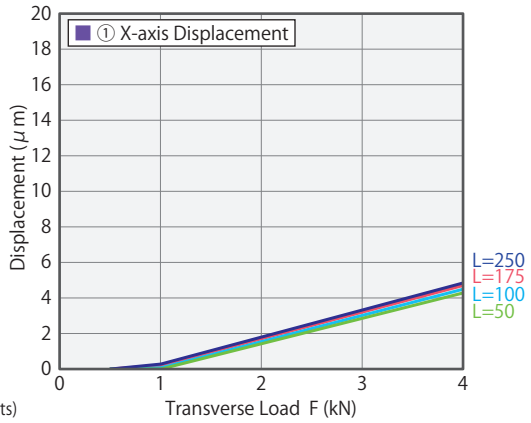


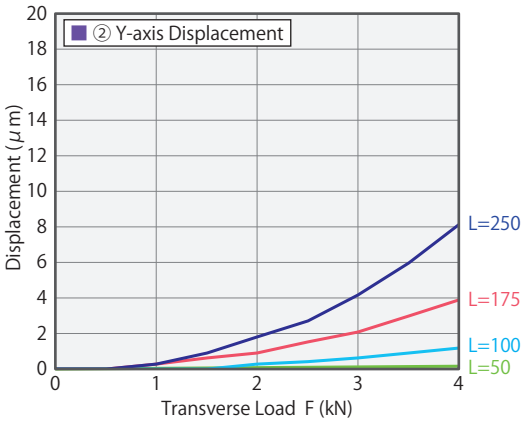
SWT0020

■ 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)



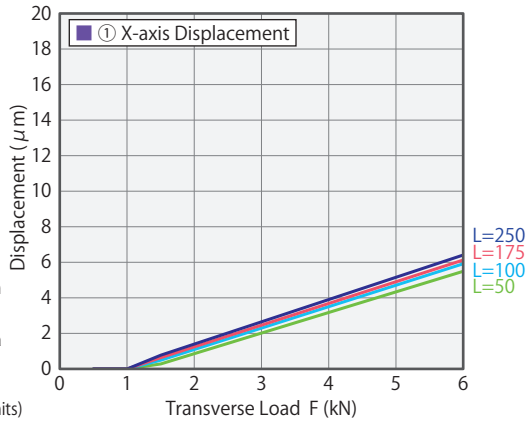


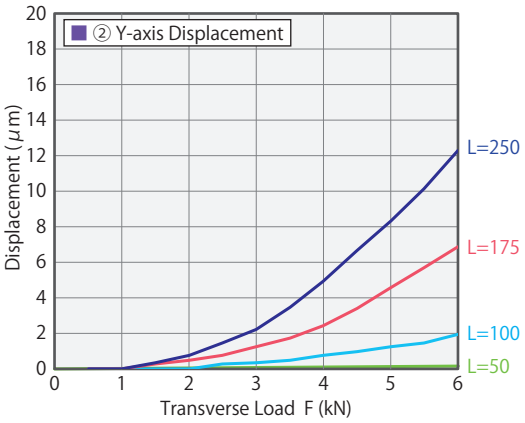
SWT0030

■ 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)



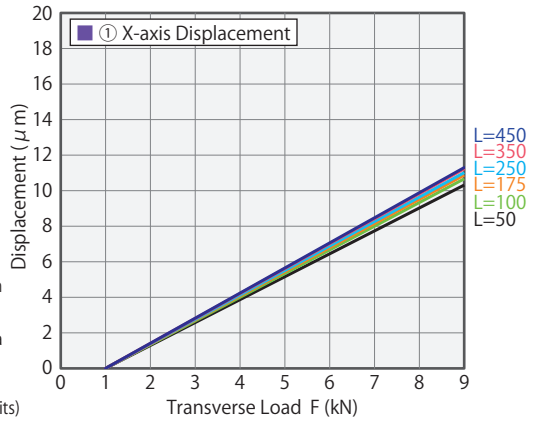


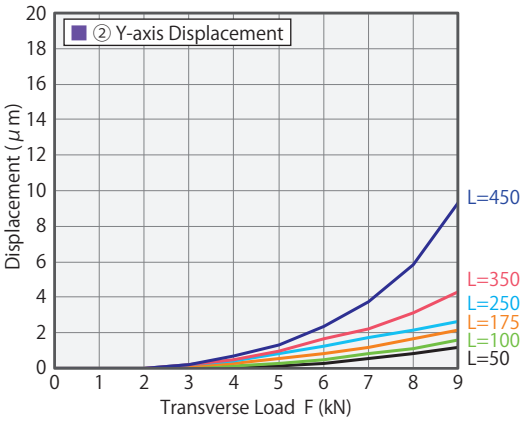
SWT0050

■ 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)



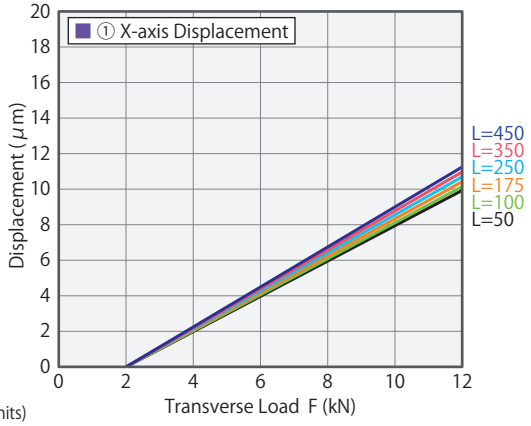


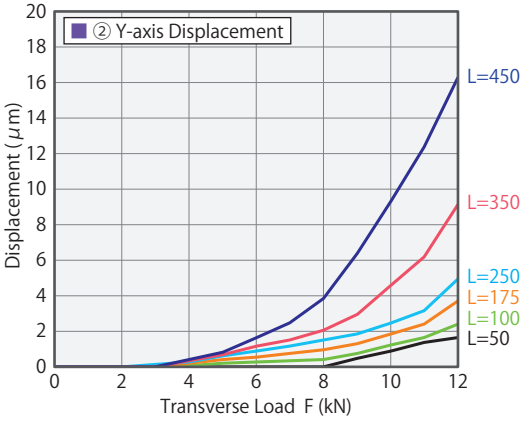
SWT0080

■ 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

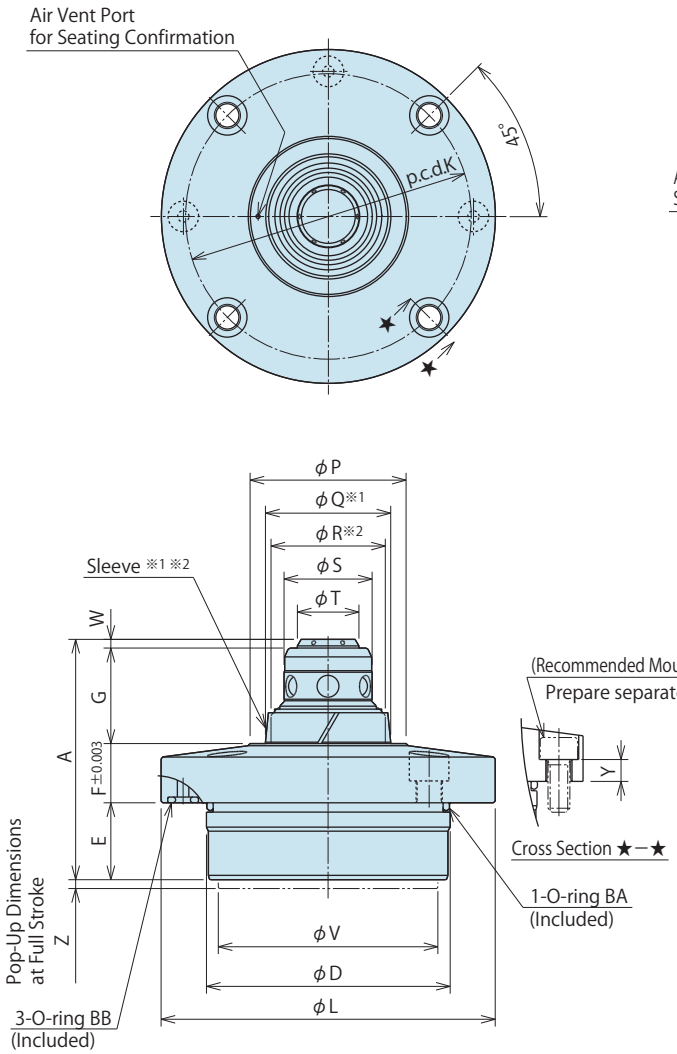
■ Clamping Force
Total 20.2kN (5.06kN×4 Units)



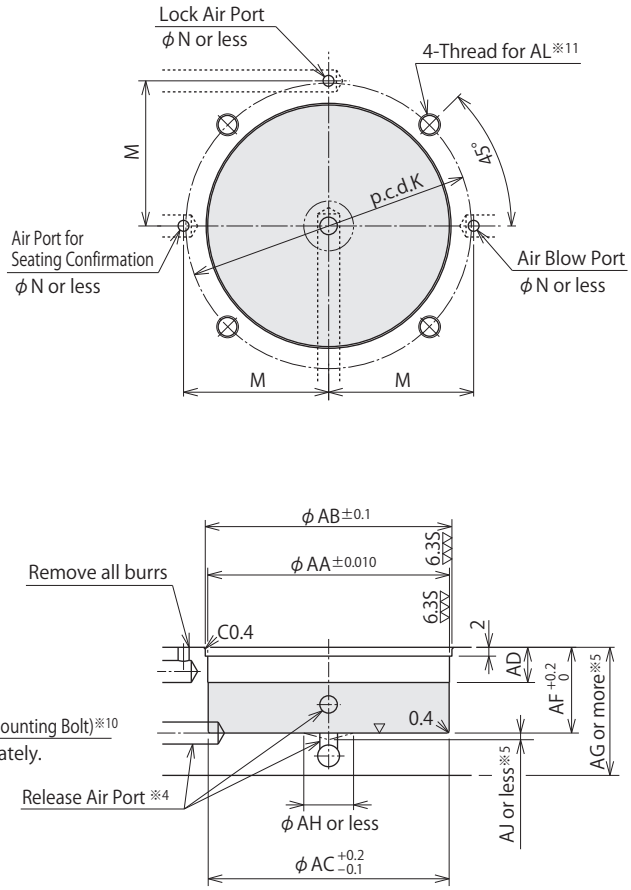


External Dimensions

※ This drawing shows the released state of SWT (when supplying release air pressure).



Machining Dimensions of Mounting Area



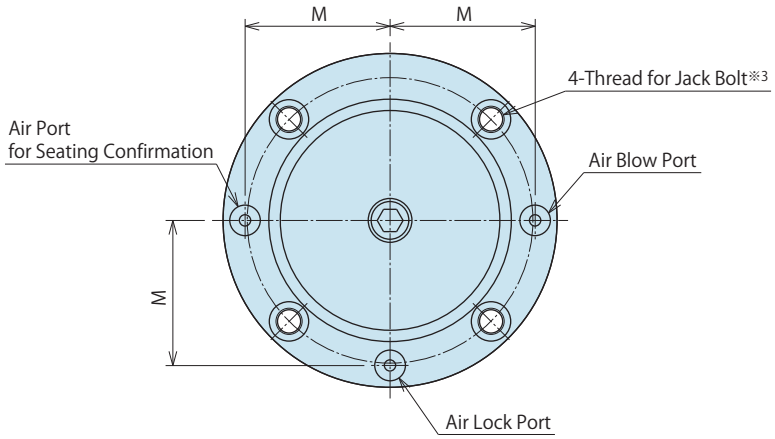
Notes :

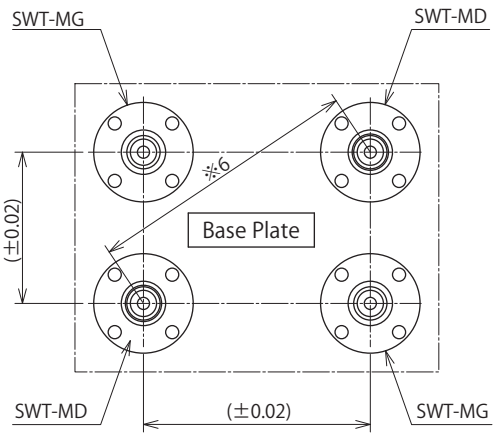
1. Remove all burrs around the hole intersection.

※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.

Distance Accuracy of Each Clamp





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 thread for jack bolt is used when removing the clamp. (See P.122 for usage.)

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				
Allowable Offset when a pallet is set※8		mm	1.0	1.0	1.5	1.5	1.5
Max. Loading Weight※9		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※10		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				
Weight※7		kg	0.25	0.5	0.8	1.3	2.5

Notes :
※7. The specifications per one unit.
※8. In case of using datum cylinder(s) only, please refer to the notes for design "6) Use a guide when not using the guide block" on P.122.
※9. 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.121.
※10.It shows holding force at 0MPa air pressure and does not satisfy specifications.

External Dimensions and Machining Dimensions for Mounting

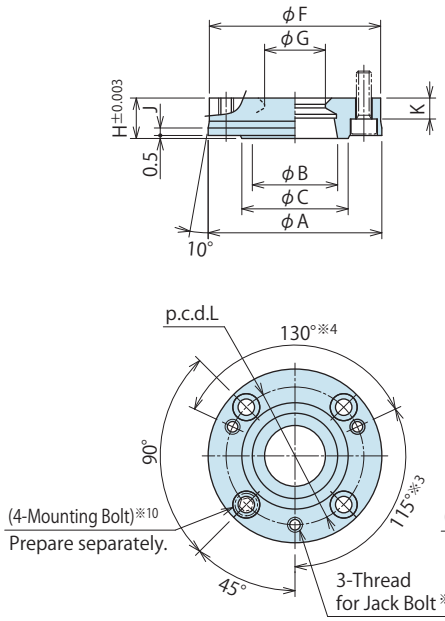
(mm)

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
Thread for Jack Bolt		M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5

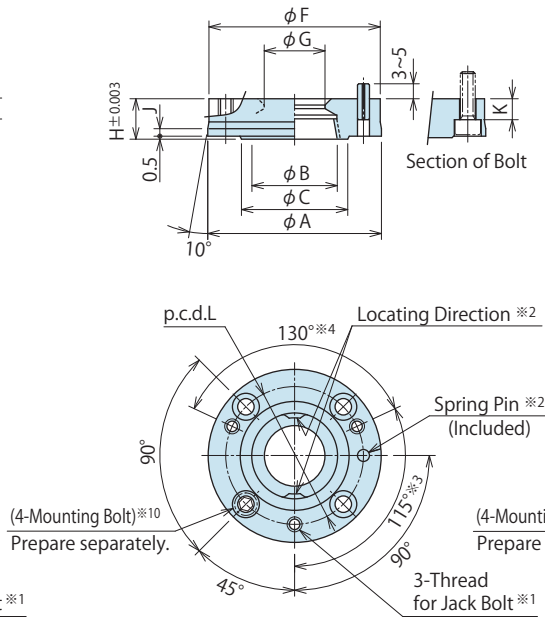
Notes : ※11. Mounting bolt is not included. Please prepare it separately. (Refer to P.119 for further information.)
※12. Determine AL thread depth for mounting bolt according to 'Y' dimension.

External Dimensions

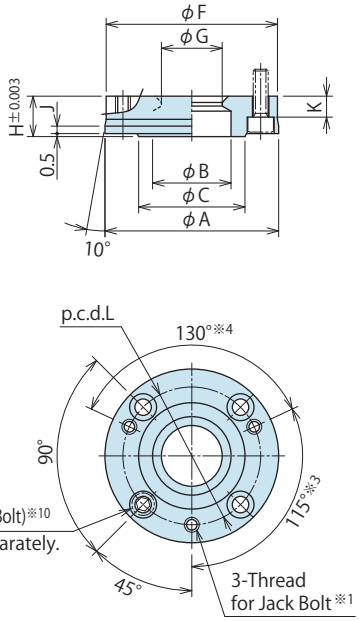
SWTB□0-D



SWTB□0-C



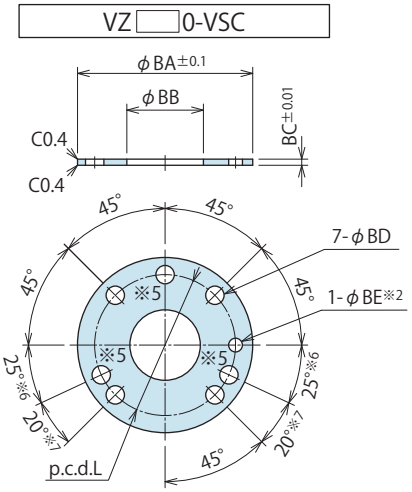
SWTB□0-G/F



Notes :
※1. The thread for jack bolt 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-□

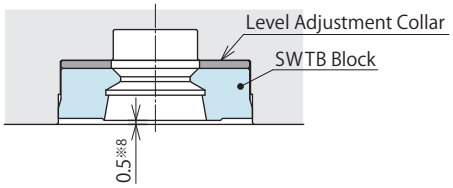
Dimensions of Level Adjustment Collar

VZ□0-VSC



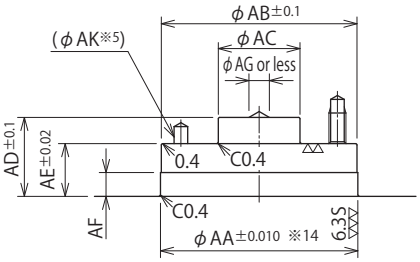
Notes :
1. Please refer to the drawing above in case the level adjustment collar is prepared by yourself.
※5. The thread (3 parts) is for jack bolt.
Align them with the phase of thread for jack bolt of SWTB block.
※6. 24° for VZ0010-VSC
※7. 21° for VZ0010-VSC

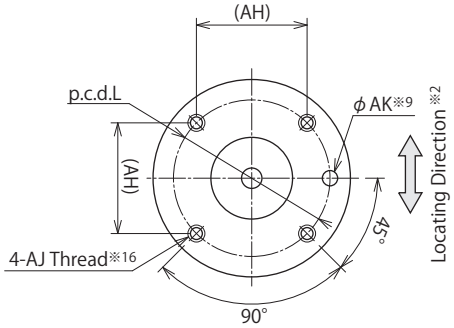
※Mounting of Level Adjustment Collar



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

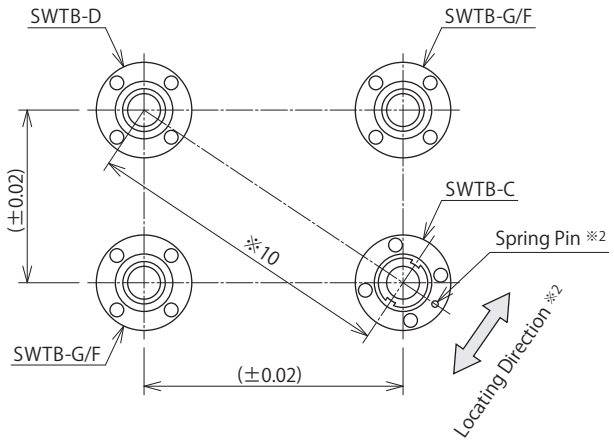
Machining Dimensions of Mounting Area



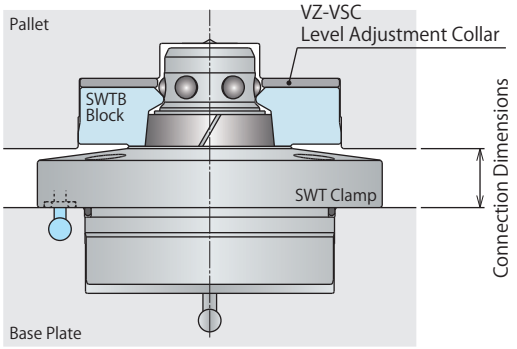


Notes :
1. This drawing shows the case where the clearance between the seating area of SWTB block and pallet bottom is 0.5mm when the collar for level adjustment is used.
※9. φAK hole is used for phasing of SWTB-C positioning direction. Please make sure φAK hole is at the line connecting the centers 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. Distance accuracy of the block should be within ±0.025mm between the blocks with the longest distance.

External Dimensions and Machining Dimensions for Mounting

(mm)

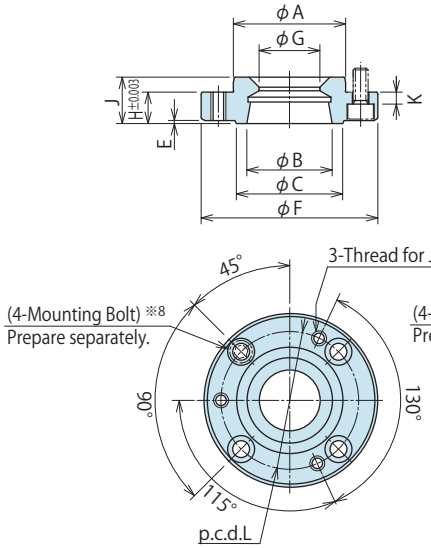
Model No.	SWTB010-D SWTB010-C	SWTB010-G SWTB010-F	SWTB020-D SWTB020-C	SWTB020-G SWTB020-F	SWTB030-D SWTB030-C	SWTB030-G SWTB030-F	SWTB050-D SWTB050-C	SWTB050-G SWTB050-F	SWTB080-D SWTB080-C	SWTB080-G SWTB080-F
A	43 $^{+0.027}_{+0.011}$	43g7 $^{-0.009}_{-0.034}$	50 $^{+0.027}_{+0.011}$	50g7 $^{-0.009}_{-0.034}$	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	
Thread for Jack Bolt	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	-
Weight	0.08 kg		0.15 kg		0.2 kg		0.35 kg		0.5 kg	
Applicable 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
Weight	0.016 kg	0.021 kg	0.03 kg	0.062 kg	0.085 kg

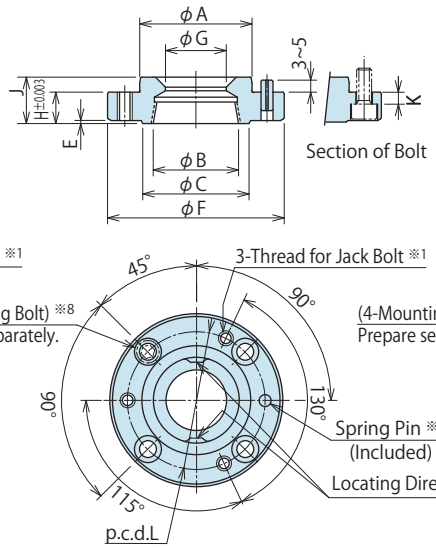
Notes :
1. Material of SWTB Block：Stainless Steel, Material of VZ□-VSC Level Adjustment Collar：Equivalent to S45C
※11. The dimensions in ( ) display that of SWTB-F.
※12. The spring pin is included only in SWTB-C.
※13. The guide block (SWTB-G) is used only for guide clamp (SWT□-MG) and the free block (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.119 for further information.)
※16. Determine AJ thread depth for mounting bolt according to 'K' and 'BC' dimension.

External Dimensions

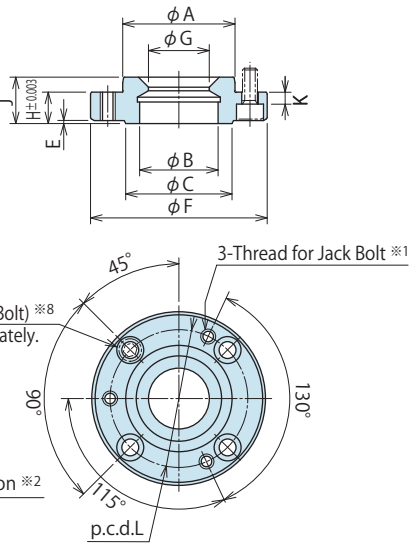
SWTJ010/020/030-D



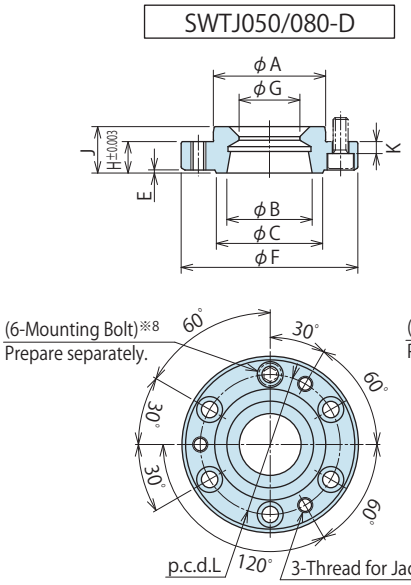
SWTJ010/020/030-C



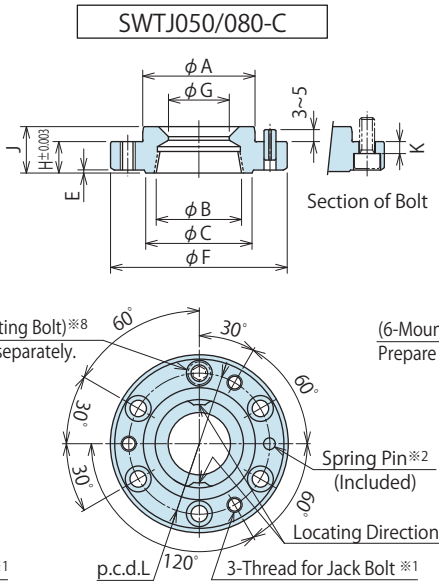
SWTJ010/020/030-G
SWTJ010/020/030-F



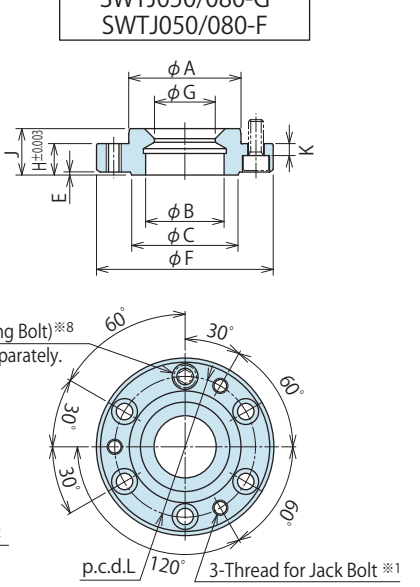
SWTJ050/080-D



SWTJ050/080-C



SWTJ050/080-G
SWTJ050/080-F

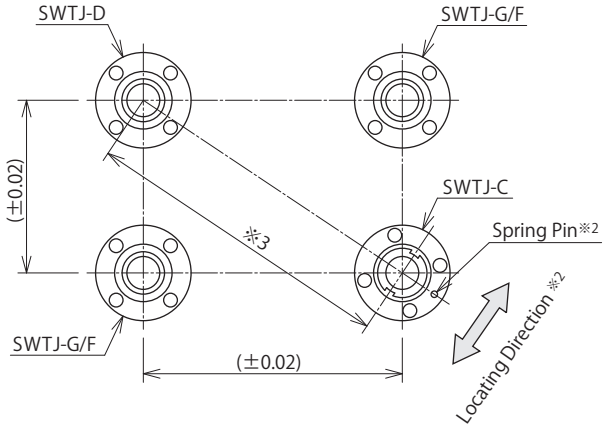


Notes :

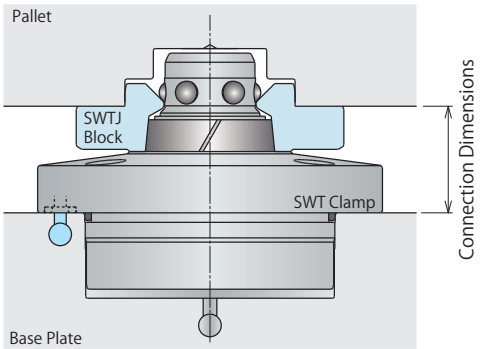
※1.The thread for jack bolt is used when removing SWTJ block.

※2.The spring pin is used for phasing of SWTJ-C locating direction.

Mounting Distance Accuracy and SWTJ-C Phase



Connection Dimensions

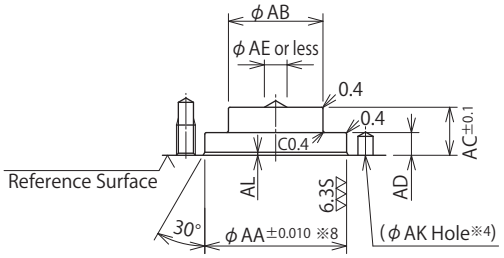


Note :

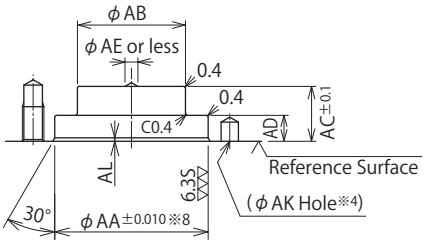
※3. Distance accuracy of the block should be within ±0.025mm between the blocks with the longest distance.

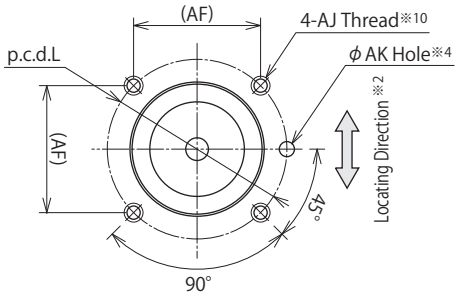
Machining Dimensions of Mounting Area

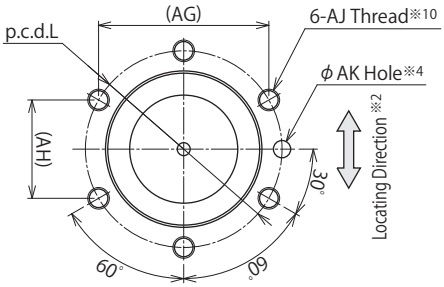
SWTJ010/020/030-□



SWTJ050/080-□







Note :

※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		0.8	
(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	
Thread for Jack Bolt	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	–
Weight	0.07kg		0.1kg		0.18kg		0.3kg		0.55kg	
Applicable 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 : Stainless Steel

※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.119 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.
(If requiring stainless steel 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.)

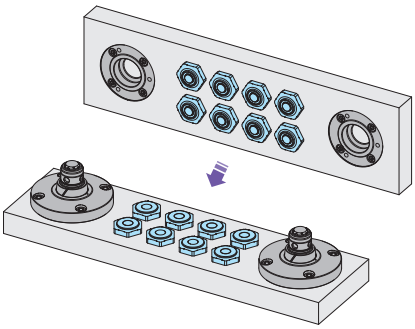
Related Products

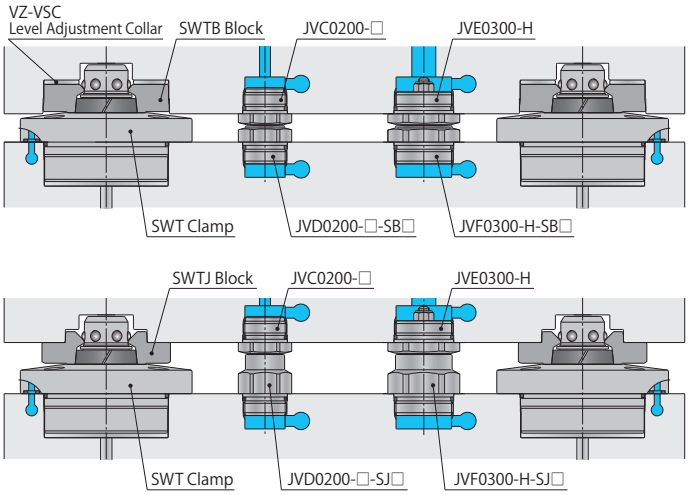
Auto Coupler (Oil/Air/Coolant) model JVC/JVD, JVE/JVF

→ P.663 ~ P.670

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

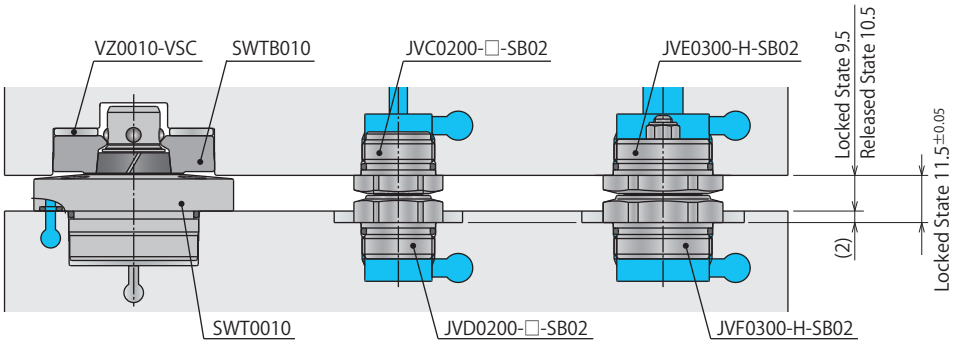
Image





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

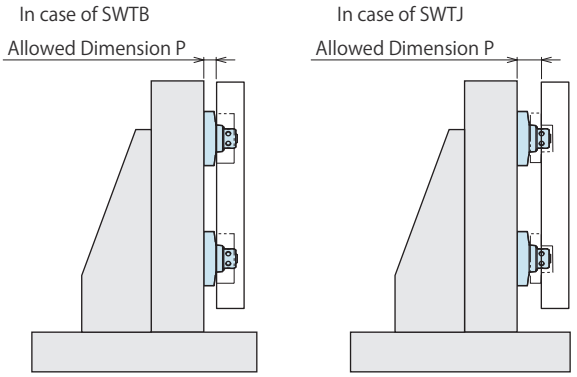
- Please use each product according to the specifications.

2) Notes for Circuit Design

- Ensure there is no possibility of supplying air pressure to the lock port and the release port simultaneously. Improper circuit design may lead to malfunctions and damages.
- Air blow passage should be ϕ6mm or more.

3) When Using a Pallet in Vertical Position

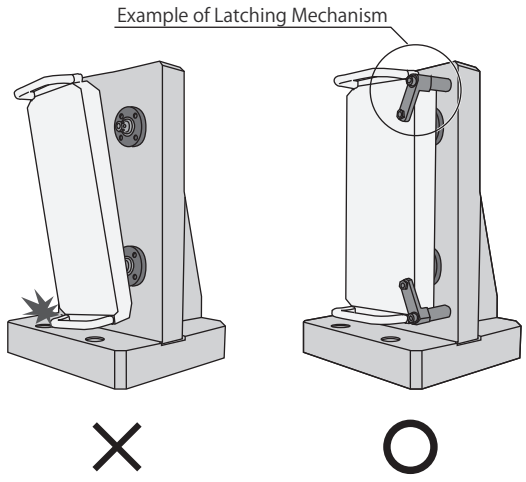
- When setting a workpiece or a fixture plate, make sure it is in proper proximity and square to the clamps.
  If it is locked out of position, the clamps may be damaged.



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

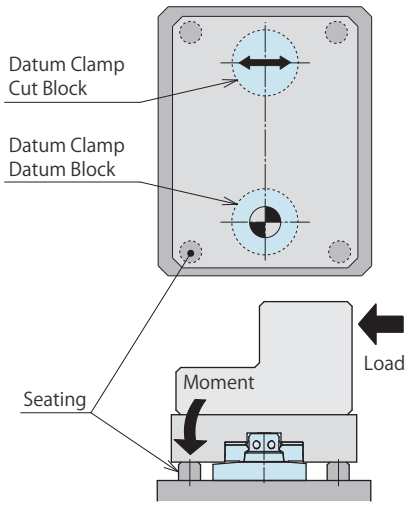
- As the workpiece fixture plate may fall down when releasing, it is recommended to set up the latching mechanism to prevent a fall.
- When the pallet is used in vertical position (hanging on the wall), the internal moving parts tend to be worn out. Please check the locating accuracy on a regular basis, and replace the product in case the locating accuracy exceeds the allowable range.



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

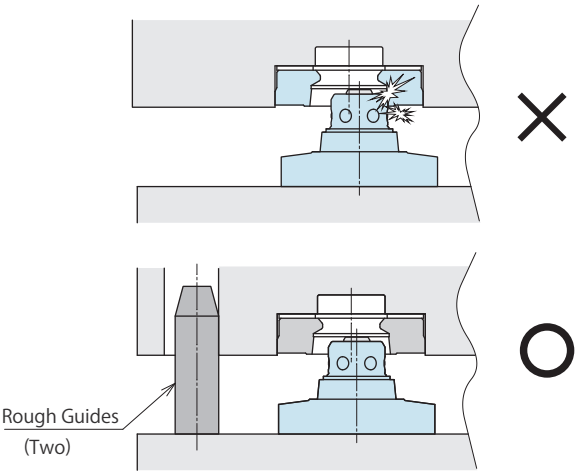
4) Seat Setting

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

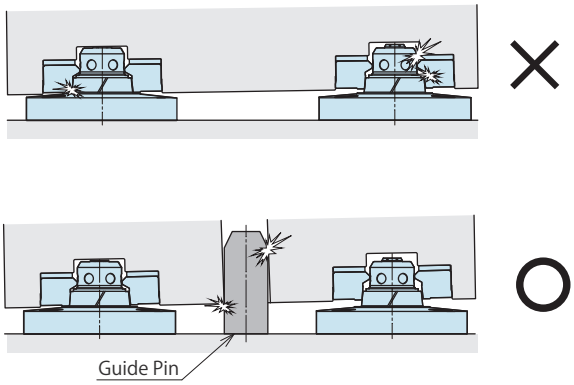


5) Setting of Rough Guide

- If the position of the pallet (fixture) during loading is outside the clamp allowable offset, 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 allowable offset.



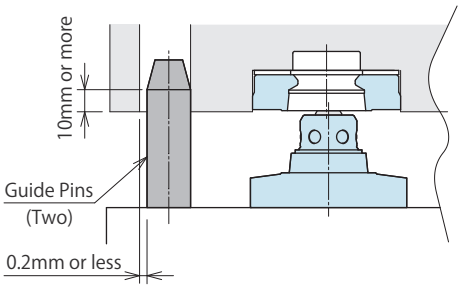
- The pallet must be level when lowering or lifting from the location clamps. If necessary, provide guide pins (rough guide) to keep the pallet level during loading and unloading.



6) Use a guide when not using the guide block (SWTB/SWTJ-G)

- The combination of the guide clamp (SWT-G) and the guide block (SWTB/SWTJ-G) ensures the protective function of the datum clamp. Please set a guide in the following cases of not using the guide block.

In case of using the combination of two datum clamps, a datum block (SWTB/SWTJ-D), and a cut block (SWTB/SWTJ-C) only.
In case of using the combination of a datum clamp and a free block (SWTB/SWTJ-F) only in order to rotate a 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) Preparation for 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.

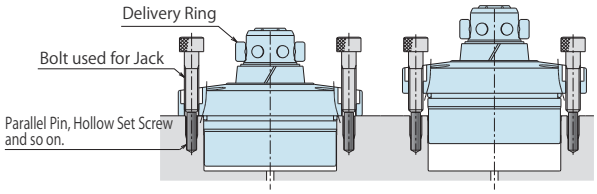
4) Mounting the Body

- Tighten hexagonal 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

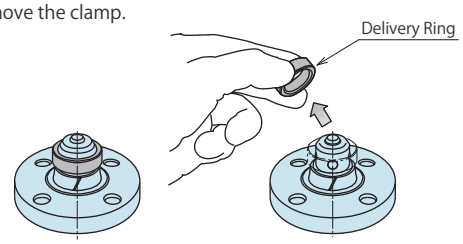
5) Removal

- Mount the delivery ring.
- Remove mounting bolts. Insert jack bolts and tighten them evenly to lift clamp.
- Protect the thread part with parallel pins, etc. as shown in the below drawing not to damage the surface of mounting bolts.

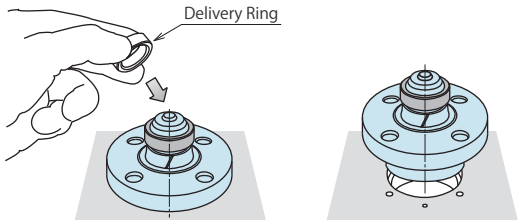


6) Delivery Ring (Important)

- The delivery ring prevents detachment of parts of individual clamp.
- The clamp will be equipped with a delivery ring for shipment. After mounting the location clamp on the fixture, remove the delivery ring before use. (When removing the delivery ring, supply release air pressure.)
- Please keep the delivery ring with great care as it is necessary to remove the clamp.



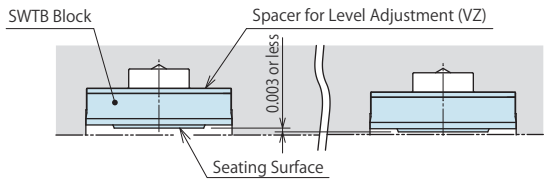
- When removing the location clamp from the fixture, mount the delivery ring in advance. Otherwise the internal parts may be detached from the spring, and they cannot be recovered.



7) Level Adjustment of SWTB Block Seating Surface

- When installing each block in the fixture plate, adjust the level of block seating surface as described below. (Recommended Level Adjustment : within ±0.003mm)

① Install in order of the level adjustment collar and the block to the fixture and tighten them with the specified torque.
② Measure the level of the seating surface of each block.
③ In case the levels are not even, remove the blocks, and grind the level adjustment collar so that the level range is within ±0.003mm.
④ Once again, install the block and level adjustment collar into the fixture plate, and check the levels.



※ Please refer to P.715 for common cautions. • Notes on Handling • Maintenance/Inspection • Warranty

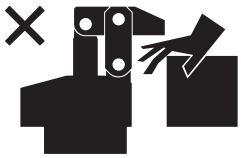
Cautions

Notes on Handling

1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no trouble/issue in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured.

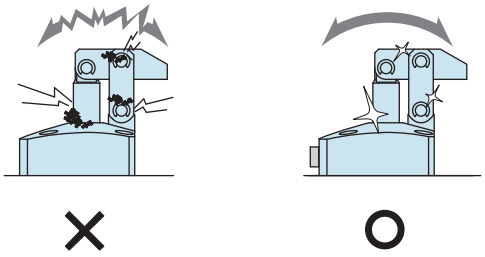


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

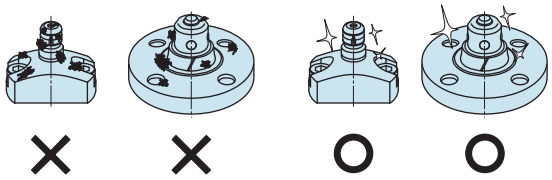
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before removing the product, make sure that the safety devices are in place. Shut off the pressure and power source and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage.



3) Regularly clean the reference surfaces (taper reference surface and seating surface) of locating products (SWT/SWQ/SWP/VRA/VRC/VX/VXE/VXF/WVS/VWH/VWM/VWK).
- Locating products (except VRA/VRC/VX/VXE/VXF and SWR without air blow port) can remove contaminants with the cleaning function. When installing a workpiece or a pallet, make sure there are no contaminants such as thick sludge.
- Continuous use with dirt on components will lead to locating failure, fluid leakage and malfunction.



4) Regularly tighten pipe, mounting bolt, nut, snap ring, cylinder and others to ensure proper use.

5) Make sure the hydraulic fluid has not deteriorated.

6) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

7) The products should be stored in the cool and dark place without direct sunshine or moisture.

8) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
  Defects or failures caused by the following are not covered.

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

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

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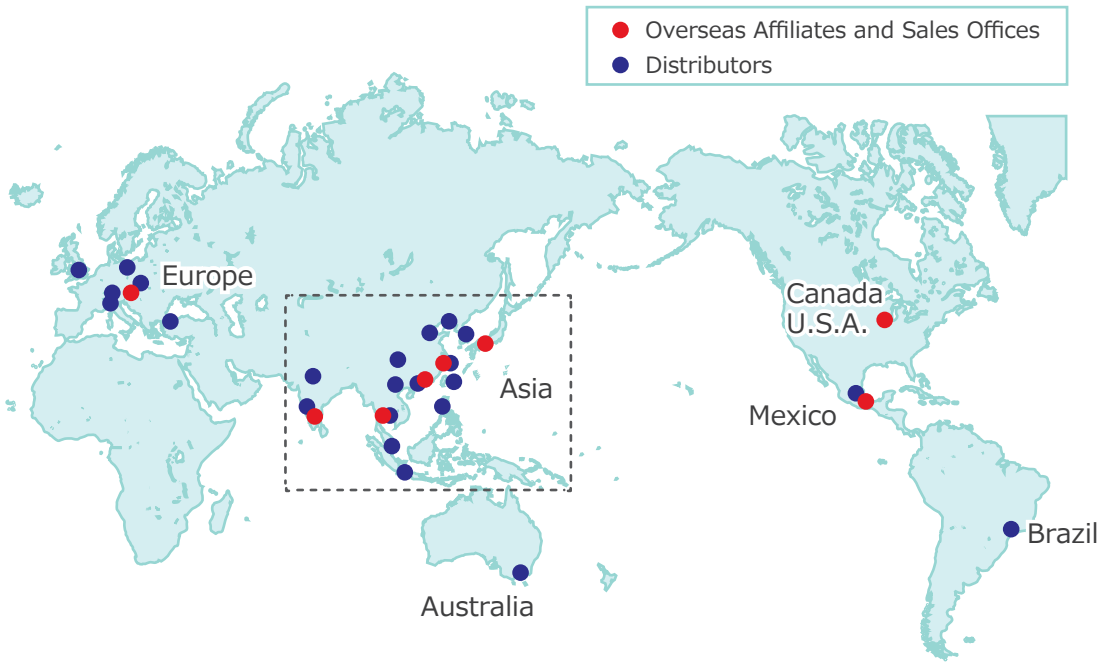
Global Network



Asia Detailed Map

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