

# **Pneumatic Centering Vise** [Built-in Check Valve]



Model FWD



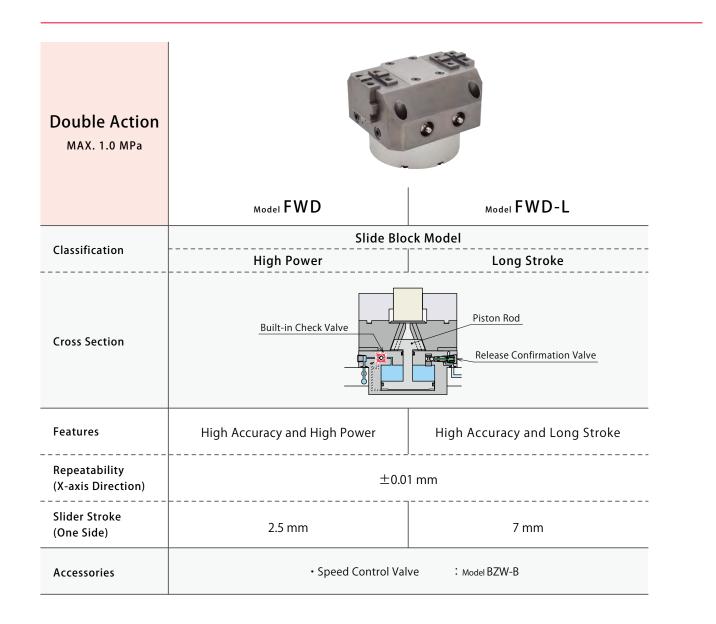
## Pneumatic Centering Vise [Built-in Check Valve]

Model FWD



## High Repeatability + High Cylinder Force + Safety Function to Maintain Locked State

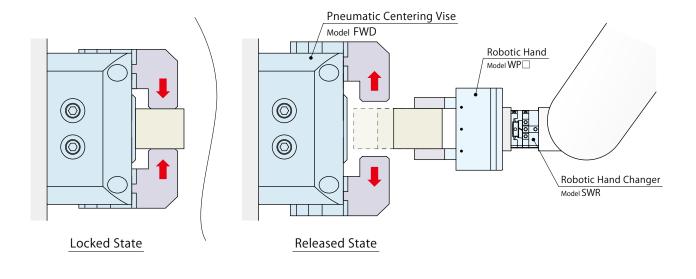
Powerful Holding of Workpiece with Air Pressure, Equipped with Release Action Confirmation



Application Examples	Action Description	Model No. / Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Cautions	

Application Examples

## • For Automatic Transfer with Robot

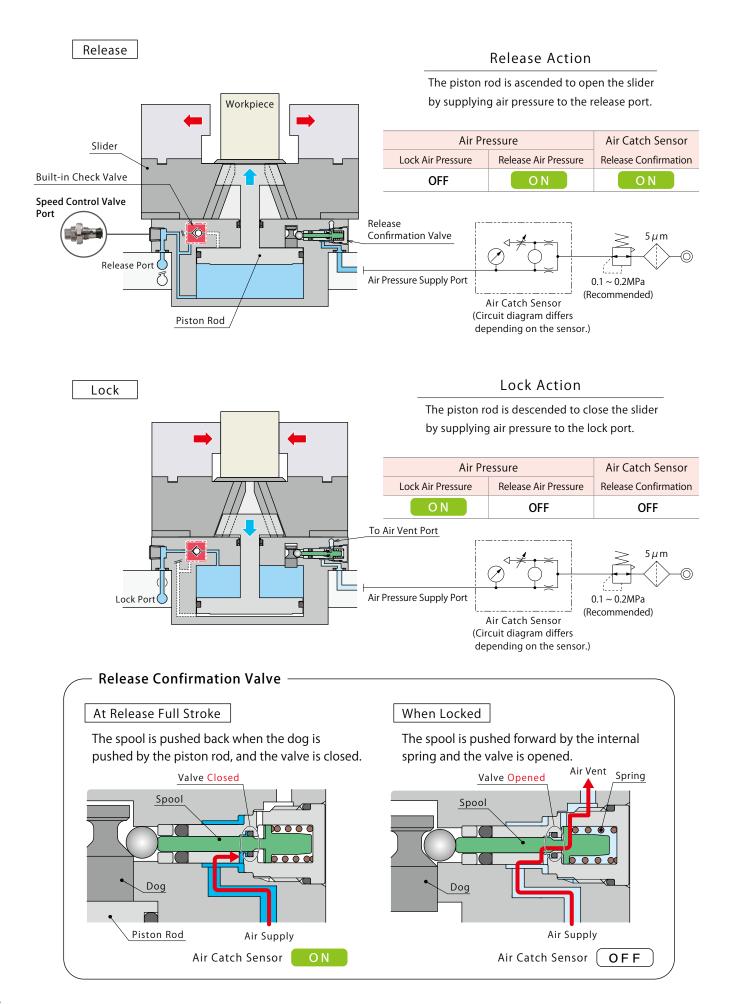


## • For Machining with a 5-Axis Machining Center



## High-Accuracy • High-Power Pneumatic Vise Best for Automation with Safety Function and Action Confirmation

## CAction Description



Application Examples	Action Description	Model No. / Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Cautions	

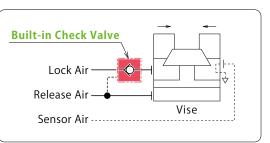
## Maintains the locked state even when air pressure is cut off.

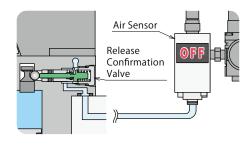
The built-in check valve maintains internal locking air pressure until air is supplied to the release port. This maintains the locked state even when locking air pressure is temporally cut off, ensuring safety.

Please supply the air pressure of [Lock Air Pressure  $\times$  0.5 (MPa)] or more to the release side (pilot pressure of built-in check valve).

## • Release Action Confirmation

Built-in release confirmation valve enables to confirm release action with an air sensor.





## High Accuracy

The slide block design enables high repeatability and is suitable for high-accuracy application. Repeatability (X-axis Direction) :  $\pm 0.01$  mm

• Excellent Maintainability

The grease nipple is equipped for lubricating internal parts. (Lubrication ports are also available for grease filling.)

• Equipped with Dust Cover



## • Easy to Machine the Machining Surface of Clamp Lever

Only slot and bolt hole need to be machined for mounting the clamp lever. Complicated serration machining is not required.

• Secure Locking of Workpiece with Powerful Gripping Force

• Able to Mount Speed Control Valve (model BZW-B)



### CAction Description (Air Sensing Chart Explanation)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor.

About Air Catch Sensor

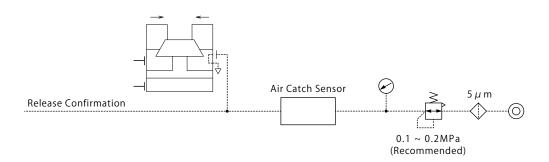
The air catch sensor is necessary for action confirmation.
 Sensing can be done by air catch sensor with the small air flow (recommended model in the list below).

Recommended Operating Air Pressure : 0.1 ~ 0.2 MPa

Recommended Air Catch Sensor

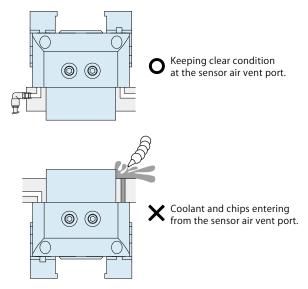
Manufacturer	SMC	CKD		
Name	Air Catch Sensor	Gap Switch		
Model	ISA3-G	GPS3-E		

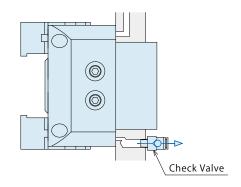
- Please refer to manufacturer's catalog etc. for the detail of the air sensor.
- The supply air pressure to the air catch sensor should be 0.1 ~ 0.2MPa.
- Continuously supply air pressure when in use.
- Refer to the drawing below for the air circuit structure.

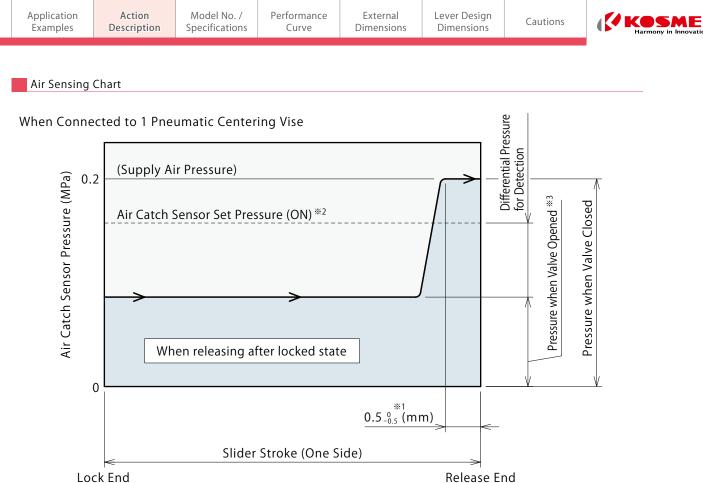


#### Notes for Design • Installation • Use

- Please keep clear condition at the sensor air vent port, and prevent coolant and chips from entering the port. The air catch sensor can malfunction if the air vent port is blocked.
- Continuously supply air pressure to the air port for sensing when in use.
- Set a check valve with low cracking pressure to the detection port of the air sensor. (Recommended Check Valve: SMC-made AKH series, cracking pressure: 0.005MPa)

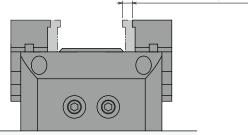






Lock End

Slider Stroke (One Side)



Notes :

- 1. The sensing chart shows the relationship between the slider stroke and the air catch sensor pressure.
- 2. The specifications may vary depending on the air circuit. The hose length should be as short as possible. (Suggest less than 5m)
- \*1. There is certain tolerance with regard to the position where the pressure for closing the valve is reached depending on the cylinder structure. (Refer to the sensing chart.)
- \*2. The position where the air catch sensor turns ON signal output varies depending on the sensor setting.
- \*3. The sensor pressure when the valve is opened differs depending on a sensor. In case of a sensor with large air consumption, the sensor pressure when the valve is opened increases and

differential pressure decreases.

C Model No. Indication



### 1 Cylinder Inner Diameter

**065** : Cylinder Inner Diameter  $\phi$  65

**085** : Cylinder Inner Diameter  $\phi$  85

**100** : Cylinder Inner Diameter  $\phi$  100

#### 2 Design No.

0 : Revision Number

### **3** Stroke Code

Blank : Standard Stroke

L : Long Stroke

		Application Examples	Action Description	Model No. / Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Cautions
--	--	-------------------------	-----------------------	-------------------------------	----------------------	------------------------	----------------------------	----------



## Specifications

Model No.			FWD0650-	FWD0850-	FWD1000-		
Slider Stroke		3 Blank		2.5			
(One Side) mm 3 L			7				
Max. Clamping Height		3 Blank	35	45	55		
(At 1MPa)	(At 1MPa) mm 3 L		75	100	125		
Cylinder Diameter *1		mm	65	85	100		
Rod Diameter <sup>%1</sup>		mm	12	16	20		
Cylinder Area		Lock	32.1	54.7	75.4		
	cm <sup>2</sup>	Release	33.2	56.7	78.5		
Cylinder Capacity	Cylinder Capacity Lock		64.1	109.5	150.8		
	cm <sup>3</sup>	Release	66.4	113.5	157.1		
Max. Operating Pressu	re	MPa	1.0				
Min. Operating Pressu	re <sup>%2</sup>	MPa	0.2				
Withstanding Pressure	2	MPa	1.5				
Recommended Air Catch	Senso	r Pressure MPa	0.1 ~ 0.2				
Recommended Air Cat	ch Sei	nsor	ISA3-G (made by SMC) / GPS3-E (made by CKD)				
Repeatability (X-axis D	irectio	on) <sup>%3</sup> mm		±0.01			
Operating Temperature °C				0~70			
Usable Fluid			Dry Air				
Weight		kg	3.5	5.4	7.4		

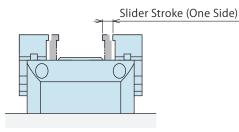
Notes :

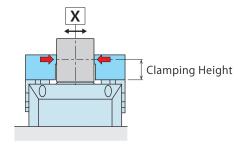
 Excessively fast operating speed of the centering vise may lead to wear-out or damage internal components. Adjust the operating speed so that the slider fully strokes within the following time period. Standard Stroke: 0.5 ~ 1.0 sec Long Stroke: 1.0 ~ 1.5 sec

2. Secure the extra stroke of 1mm or more.

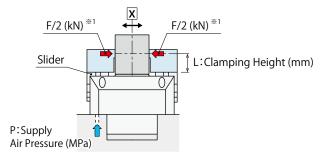
%1. Clamping force cannot be calculated from the cylinder inner diameter and rod diameter. Please refer to the clamping force curve.

- \*2. Supply the air pressure of [Lock Air Pressure × 0.5 (MPa)] or more to the release side (pilot pressure of built-in check valve).
- %3. Repeatability under the same condition.





### Clamping Force Curve



## • FWD Standard Stroke

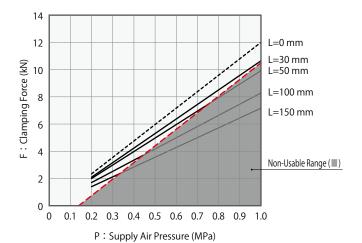
FWD0650								
Calculation Formula <sup>*2</sup> (kN) $F = (2650 \times P) / (220 + L)$								
Clamping F	Clamping Force (kN) Non-Usable Range (							
Air Pressure		Clampi	ng Height	L (mm)				
(MPa)	0	30	50	100	150			
1.0	12.0	10.6						
0.9	10.8	9.5						
0.8	9.6	8.5						
0.7	8.4	7.4	6.9					
0.6	7.2	6.4	5.9					
0.5	6.0	5.3	4.9					
0.4	4.8	4.2	3.9	3.3				
0.3	3.6	3.2	2.9	2.5	2.1			
0.2	2.4	2.1	2.0	1.7	1.4			

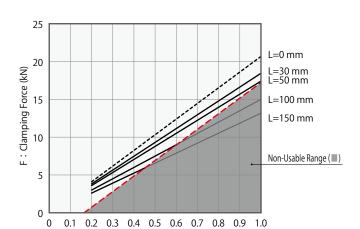
FWD0850								
Calculation Formula <sup>*2</sup> (kN) $F = (5440 \times P) / (263 + L)$								
Clamping F	orce (kN)		Nor	n-Usable F	Range (🔳)			
Air Pressure		Clampi	ng Height	L (mm)				
(MPa)	0	30	100	150				
1.0	20.7	18.6	17.4					
0.9	18.6	16.7	15.6					
0.8	16.5	14.9	13.9					
0.7	14.5	13.0	12.2					
0.6	12.4	11.1	10.4					
0.5	10.3	9.3	8.7	7.5				
0.4	8.3	7.4	7.0	6.0	5.3			
0.3	6.2	5.6	5.2	4.5	4.0			
0.2	4.1	3.7	3.5	3.0	2.6			

FWD1000								
Calculation Formula <sup>*2</sup> (kN) $F = (8460 \times P) / (295 + L)$								
Clamping F	orce (kN)		Nor	n-Usable F	lange (🔳)			
Air Pressure		Clampi	ng Height	L (mm)				
(MPa)	0	30	50	100	150			
1.0	28.7	26.0	24.5					
0.9	25.8	23.4	22.1					
0.8	22.9	20.8	19.6					
0.7	20.1	18.2	17.2					
0.6	17.2	15.6	14.7	12.9				
0.5	14.3	13.0	12.3	10.7				
0.4	11.5	10.4	9.8	8.6	7.6			
0.3	8.6	7.8	7.4	6.4	5.7			
0.2	5.7	5.2	4.9	4.3	3.8			

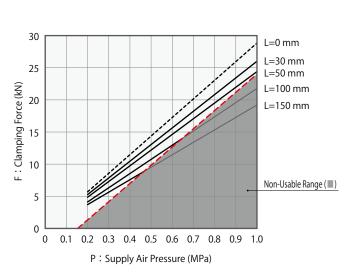
#### Notes:

- 1. This table and graph show the relationship among F:Clamping Force (kN), P:Supply Air Pressure (MPa), and L:Clamping Height (mm).
- 2. Using in the non-usable range may damage the product and lead to fluid leakage.
- 3. When load is applied from the same direction with the slider (X-axis direction), please consider it referring to F/2:clamping force on one side.
- $\%1.\,$  F indicates the total value of clamping force (kN) on both sides.
- %2. F:Clamping Force (kN), P:Supply Air Pressure (MPa), L:Clamping Height (mm).





P: Supply Air Pressure (MPa)



9

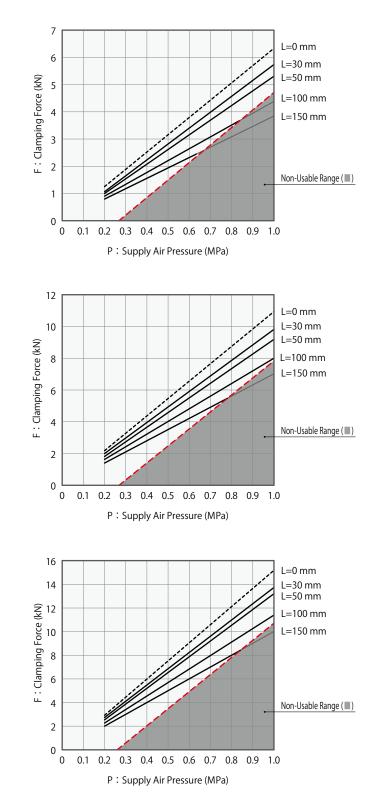
Application Examples	Action Description	Model No. / Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Cautions	
							I

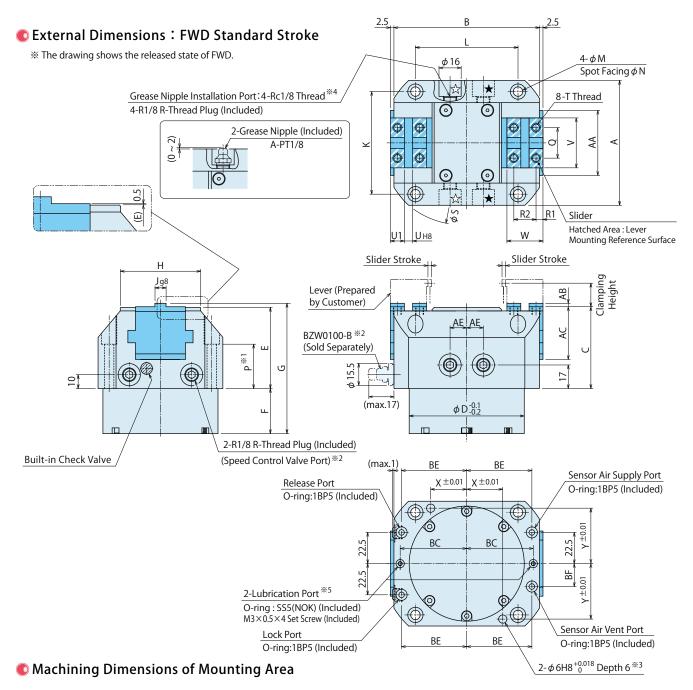
## • FWD-L Long Stroke

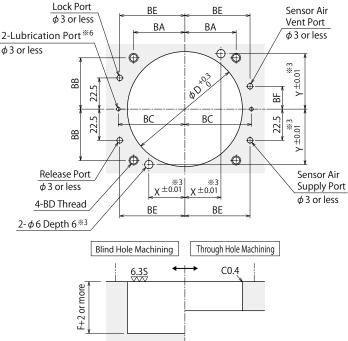
FWD0650-L									
Calculation F	Calculation Formula <sup>*2</sup> (kN) $F = (1440 \times P) / (226 + L)$								
Clamping F	orce (kN)		Nor	n-Usable F	Range (🔳)				
Air Pressure		Clampi	ng Height	L (mm)					
(MPa)	0	30	50	100	150				
1.0	6.4	5.6	5.2						
0.9	5.7	5.1	4.7						
0.8	5.1	4.5	4.2	3.5					
0.7	4.5	3.9	3.7	3.1					
0.6	3.8	3.4	3.1	2.7	2.3				
0.5	3.2	2.8	2.6	2.2	1.9				
0.4	2.5	2.3	2.1	1.8	1.5				
0.3	1.9	1.7	1.6	1.3	1.1				
0.2	1.3	1.1	1.0	0.9	0.8				

FWD0850-L								
Calculation Formula <sup>*2</sup> (kN) $F = (2950 \times P) / (270 + L)$								
Clamping F	orce (kN)		Nor	n-Usable F	lange (🔳)			
Air Pressure		Clampi	ng Height	L (mm)				
(MPa)	0	30	50	100	150			
1.0	10.9	9.8	9.2	8.0				
0.9	9.8	8.9	8.3	7.2				
0.8	8.7	7.9	7.4	6.4				
0.7	7.6	6.9	6.5	5.6	4.9			
0.6	6.6	5.9	5.5	4.8	4.2			
0.5	5.5	4.9	4.6	4.0	3.5			
0.4	4.4	3.9	3.7	3.2	2.8			
0.3	3.3	3.0	2.8	2.4	2.1			
0.2	2.2	2.0	1.8	1.6	1.4			

FWD1000-L								
Calculation F	Calculation Formula $\frac{2}{2}$ (kN) F = (4570 × P) / (300 + L)							
Clamping F	orce (kN)		Nor	n-Usable F	lange (🔳)			
Air Pressure		Clampi	ng Height	L (mm)				
(MPa)	0	30	50	100	150			
1.0	15.2	13.8	13.1	11.4				
0.9	13.7	12.5	11.8	10.3				
0.8	12.2	11.1	10.4	9.1	8.1			
0.7	10.7	9.7	9.1	8.0	7.1			
0.6	9.1	8.3	7.8	6.9	6.1			
0.5	7.6	6.9	6.5	5.7	5.1			
0.4	6.1	5.5	5.2	4.6	4.1			
0.3	4.6	4.2	3.9	3.4	3.0			
0.2	3.0	2.8	2.6	2.3	2.0			







#### Notes :

- 1. Roughness of mounting surface should be 6.3S or better.
- 2. Install a lever on the top of the slider when in use.
- 3. Please keep clear condition at the sensor air vent port, and prevent coolant and chips from entering the port.
- ※1. Mounting bolts are not provided with the product. Please prepare them according to the mounting height referring to dimension 'P'.
- %2. Speed control valve is sold separately. Refer to P.19 for further information.
- \*\*3. Able to locate the body of centering vise by using  $\phi 6$  hole. Please consider X, Y dimension tolerance and  $\phi 6$  hole tolerance according to a locating pin. Locating pin is not included.
- ※4. When shipping, R-thread plugs are mounted to the grease nipple installation port. Select one port each from ☆ and ★ ports and install the grease nipples to the selected ports.
- %5. The lubrication port enables to fill grease without using the grease nipple. When using the lubrication port, remove the set screws.
- %6. This machining is required only when using the lubrication port.

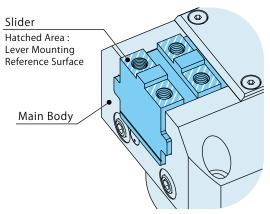
Application	Action Model No. /	Performance	External	Lever Design	Cautions
Examples De	escription Specifications	Curve	Dimensions	Dimensions	

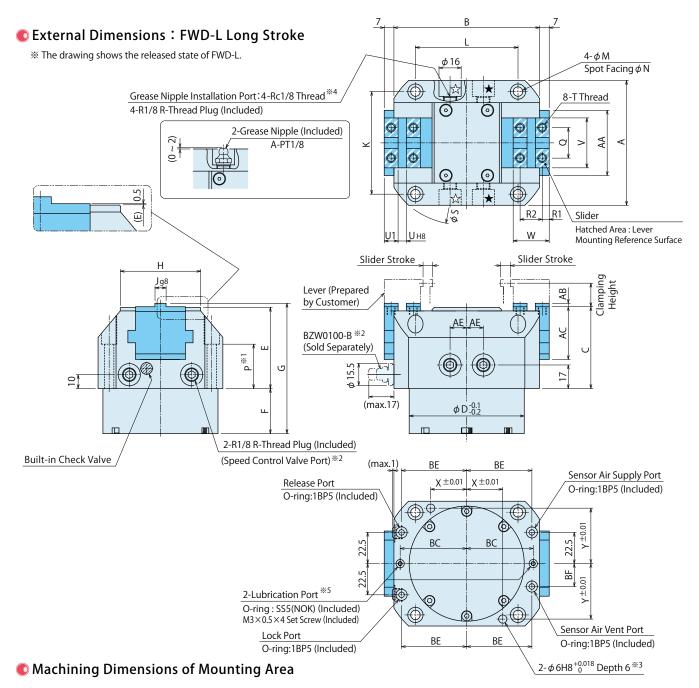


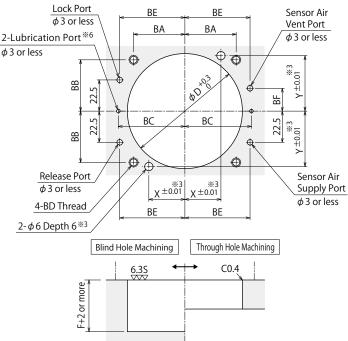
## © External Dimensions and Machining Dimensions for Mounting

Model No.	FWD0650	FWD0850	FWD1000
A	90	110	125
В	105	125	140
С	59	61.5	63.5
D	83	103	118
E	58.5	61	63
F	32.5	34	39.5
G	94	98.5	106
Н	58	65	80
J	8 - 0.005	8 - 0.005	10 - 0.005
К	74	92	100
L	74	92	105
М	6.8	9	11
N	11	14	17.5
Р	32	26	28
Q	22	24	26
R1	5	6.5	8
R2	16	21	24
S	123	147	167
T (Nominal×Pitch×Depth)	M6×1×10	M8×1.25×12	M10×1.5×15
U	6 <sup>+0.018</sup>	8 +0.022	8 +0.022
U1	10	13	16
V	36	40	45
W	26	34	40
Х	26	35	41
Y	40	47.5	55
AA	47	52	59
AB	2.5	3	3
AC	38	40.5	42.5
AE	12	20	27.5
BA	37	46	52.5
BB	37	46	50
BC	48	58	65.5
BD (Nominal×Pitch×Depth)	M6×1×10	M8×1.25×12	M10×1.5×15
BE	47	57	64.5
BF	16.5	20	22.5

## Lever Mounting Part







#### Notes :

- 1. Roughness of mounting surface should be 6.3S or better.
- 2. Install a lever on the top of the slider when in use.
- 3. Please keep clear condition at the sensor air vent port, and prevent coolant and chips from entering the port.
- ※1. Mounting bolts are not provided with the product. Please prepare them according to the mounting height referring to dimension 'P'.
- %2. Speed control valve is sold separately. Refer to P.19 for further information.
- ※3. Able to locate the body of centering vise by using φ6 hole. Please consider X, Y dimension tolerance and φ6 hole tolerance according to a locating pin. Locating pin is not included.
- ※4. When shipping, R-thread plugs are mounted to the grease nipple installation port. Select one port each from ☆ and ★ ports and install the grease nipples to the selected ports.
- %5. The lubrication port enables to fill grease without using the grease nipple. When using the lubrication port, remove the set screws.
- %6. This machining is required only when using the lubrication port.

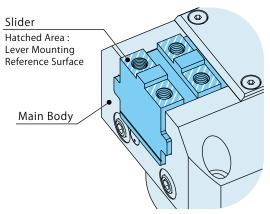
Application ExamplesAction DescriptionModel No. / SpecificationsPerformance CurveExternal Dimensions	Lever Design Dimensions	
---	----------------------------	--



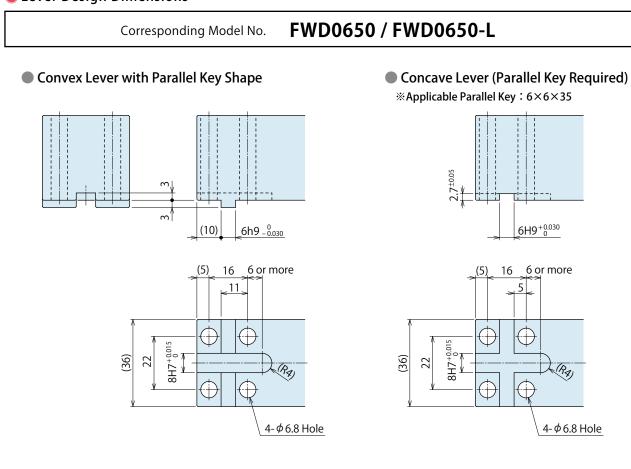
## © External Dimensions and Machining Dimensions for Mounting

Model No.	FWD0650-L	FWD0850-L	FWD1000-L
A	90	110	125
В	105	125	140
С	59	61.5	63.5
D	83	103	118
E	58.5	61	63
F	32.5	34	39.5
G	94	98.5	106
Н	58	65	80
J	8 - 0.005	8 - 0.005	10 - 0.005
К	74	92	100
L	74	92	105
Μ	6.8	9	11
Ν	11	14	17.5
Р	32	26	28
Q	22	24	26
R1	5	6.5	8
R2	16	21	24
S	123	147	167
T (Nominal×Pitch×Depth)	M6×1×10	M8×1.25×12	M10×1.5×15
U	6 +0.018	8 +0.022	8 +0.022
U1	10	13	16
V	36	40	45
W	26	34	40
Х	26	35	41
Y	40	47.5	55
AA	47	52	59
AB	2.5	3	3
AC	38	40.5	42.5
AE	12	20	27.5
BA	37	46	52.5
BB	37	46	50
BC	48	58	65.5
3D (Nominal×Pitch×Depth)	M6×1×10	M8×1.25×12	M10×1.5×15
BE	47	57	64.5
BF	16.5	20	22.5

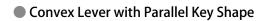
## Lever Mounting Part

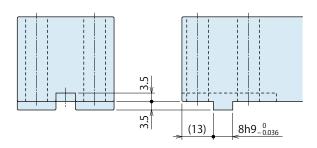


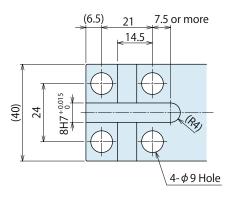
### Lever Design Dimensions

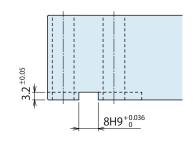


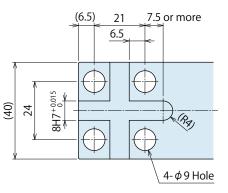
Corresponding Model No. **FWD0850 / FWD0850-L** 

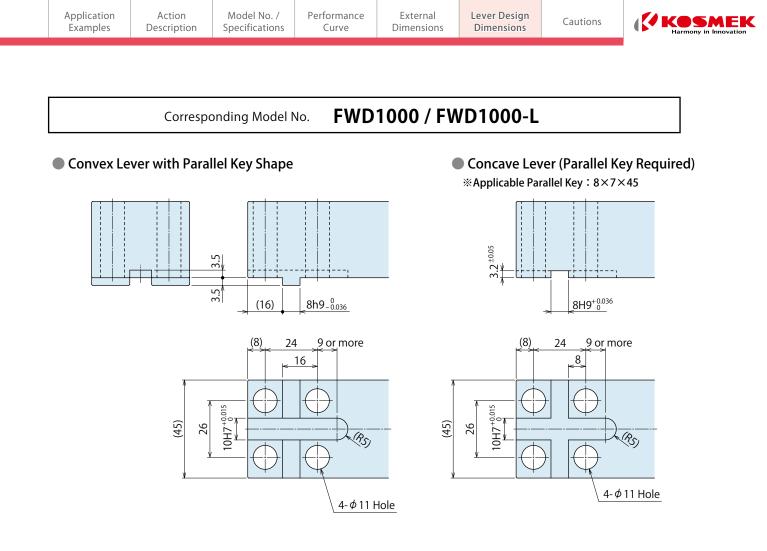










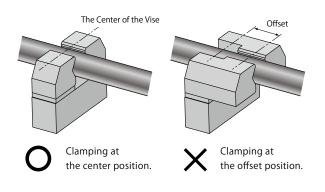


#### Notes :

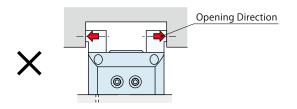
- 1. This drawing shows the design dimensions of the left side lever facing the product.
- 2. The tolerance of the key slot is a reference. Please change it if necessary.
- 3. FWD Pneumatic Centering Vise does not include parallel keys. Parallel keys need to be prepared by customer in case of concave lever.

#### Cautions 🔍

- Notes for Design
- 1) Check Specifications
- Please use each product according to the specifications.
- 2) Notes for Circuit Design
- Please design the air circuit properly and review the circuit design in advance in order to avoid malfunction or breakage of the device.
- Ensure there is no possibility of supplying air pressure to the lock port and the release port simultaneously.
- 3) Do not apply impact on the lever (prepared by customer) when loading a workpiece.
- Otherwise, it leads to malfunction or damage to the lever.
- 4) Clamp the workpiece at the center of the vise.
- FWD is not applicable for offset clamping.



- 5) Do Not Clamp in Opening Direction
- FWD is NOT designed to clamp in opening direction as shown below.



#### 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) Filling the Grease
- Before use, fill the grease from the grease nipple or the lubrication port, and operate the centering vise 2 or 3 times without a workpiece.
   Use the grease of lithium soap thickened, mineral oil grease fortified with MoS2. (Recommended Grease : MOLYKOTE® BR-2 PLUS made by TORAY • DOW CORNING)

If too much grease is applied it may be overflowed from the gap of the product body and the slider during operation.

- 5) Installation/Removal of the Lever (Prepared by Customer)
- Use hexagonal socket bolts for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the following list. Installation failure causes the deformation of lever and decrease of clamping force.

Model No.	Mounting Bolt Size	Tightening Torque (N·m)
FWD0650 FWD0650-L	M6×1	10
FWD0850 FWD0850-L	M8×1.25	25
FWD1000 FWD1000-L	M10×1.5	50

6) Installation of the Centering Vise

When mounting the centering vise, use hexagonal socket bolts as multiple bolt holes for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the following list. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

Model No.	Mounting Bolt Size	Tightening Torque (N·m)
FWD0650 FWD0650-L	M6×1	10
FWD0850 FWD0850-L	M8×1.25	25
FWD1000 FWD1000-L	M10×1.5	50

- 7) Operating Speed Adjustment
- Excessively fast operating speed of the centering vise may lead to wear-out or damage internal components. Adjust the operating speed so that the slider fully strokes within the following time period. Standard Stroke : 0.5 ~ 1.0 sec
  - Long Stroke: 1.0 ~ 1.5 sec
- Install a flow control valve and gradually control the flow rate from low-speed side (small flow) to the designated speed. Controlling from high-speed side (large flow) causes excessive surge pressure or overload to the centering vise leading to damage of a machine or device.

Application Examples	Action Description	Model No. / Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Cautions	

#### Notes on Handling

- 1) It should be operated by qualified personnel.
- Hydraulic and/or pneumatic machines and devices 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 removing the product, 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 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.
- Do not touch the centering vise while it is working. Otherwise, your hands may be injured.



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

#### Maintenance and Inspection

- 1) Removal of the Product and Shut-off of Pressure Source
- Before removing the product, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in air circuits.
   Make sure there is no abnormality in the bolts and respective
- parts before restarting.
- Regularly tighten pipes, mounting bolts, nuts and others to ensure proper use.
- 3) 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.
- 4) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 5) Regularly fill the grease from the grease nipple or the lubrication port (recommended : once a month or every five-thousand cycles). Use the grease of lithium soap thickened, mineral oil grease fortified with MoS2. (Recommended Grease : MOLYKOTE® BR-2 PLUS made by TORAY • DOW CORNING)

If too much grease is applied it may be overflowed from the gap of the product body and the slider during operation.

#### 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 handled in inappropriate way by the operator.
  (Including damage caused by the misconduct of the third party.)
- ④ If the defect is caused by reasons other than our responsibility.
- ⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
- ⑥ Other caused by natural disasters or calamities not attributable to our company.
- ⑦ Parts or replacement expenses due to parts consumption and deterioration.

(Such as rubber, plastic, seal material and some electric components.)

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

## **Air Flow Control Valve**

## Model **BZW**

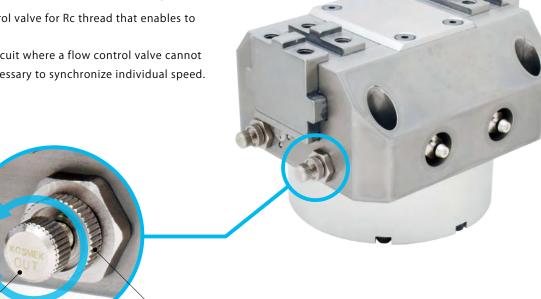


Directly mounted to the pneumatic centering vise. Enables one-touch speed adjustment.

## • Directly Mounted to Pneumatic Centering Vise

BZW is the flow control valve for Rc thread that enables to mount to FWD.

It is best used in a circuit where a flow control valve cannot be mounted or if necessary to synchronize individual speed.



Adjusting Screw

Model No. Indication



**Control Method** B: Meter-out Design No. 0: Revision Number R Thread Size 010: Rc1/8

Lock Nut



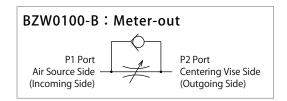
10

#### Specifications

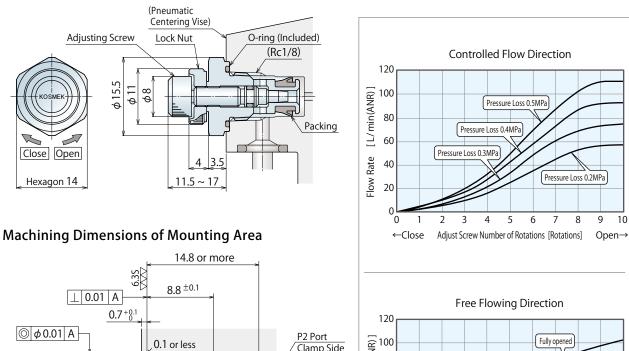
**External Dimensions** 

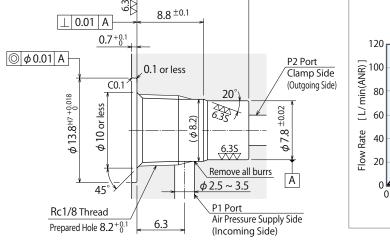
Model No.	BZW0100-B	
Control Method	Meter-out	
Operating Pressure	MPa	0.1 ~ 1.0
Withstanding Pressure	1.5	
Adjusting Screw Number of Rot	10	
Tightening Torque	5 ~ 7	
Weight	13	
Corresponding Model I	FWD 🗔 - 🗌	

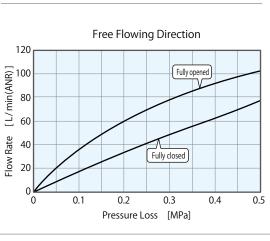
#### **Circuit Symbol**



#### Flow Rate Graph







#### Notes :

- 1. Since the  $\bigtriangledown$  area is sealing part, be careful not to damage it.
- 2. No cutting chips or burr should be at the tolerance part of machining hole.

3. As shown in the drawing, P1 port is used as the air pressure supply side and P2 port as the centering vise side.



United States of America SUBSIDIARY	KOSMEK (USA) LTD. 650 Springer Drive, Lomba TEL. +1-630-620-7650	
MEXICO REPRESENTATIVE OFFICE		te ol. Santa Fe Juriquilla, Queretaro, TEL. +52-1-55-3044-9983
EUROPE SUBSIDIARY	KOSMEK EUROPE GmbH Schleppeplatz 2 9020 Klag TEL. +43-463-287587	enfurt am Wörthersee Austria FAX. +43-463-287587-20
CHINA SUBSIDIARY	KOSMEK (CHINA) LTD. Room601, RIVERSIDE PYRAMII Shanghai 200125, China	D No.55, Lane21, Pusan Rd, Pudong TEL. +86-21-54253000
INDIA BRANCH OFFICE	KOSMEK LTD INDIA F 203, Level-2, First Floor, Prest Bangalore -560052 India	ige Center Point, Cunningham Road, TEL.+91-9880561695
THAILAND REPRESENTATIVE OFFICE	KOSMEK Thailand Represe 67 Soi 58, RAMA 9 Rd., Phatthana TEL. +66-2-300-5132	kan, Suanluang, Bangkok 10250, Thailand

## KOSMEK LTD.

## http://www.kosmek.com/

HEAD OFFICE 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241 TEL.+81-78-991-5162 FAX.+81-78-991-8787

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



2020/08 First PDF