# Hydraulic Expansion Locating Pin

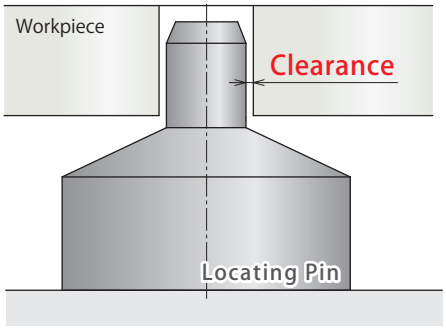
Model VFL
Model VFM
Model VFJ
Model VFK


## Locating Repeatability　VFL/VFM：3μm　VFJ/VFK：10μm

Zero Clearance between Reference Hole and Expansion Locating Pin

## Hydraulic expansion locating pin locates a workpiece with high accuracy by expanding and releasing diameter.

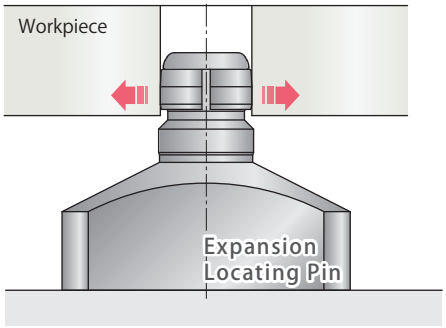
**A general locating pin has some clearance between the pin and a workpiece hole.**




General Locating Pin

**Expansion locating pin has zero clearance between the pin and a reference hole!!**

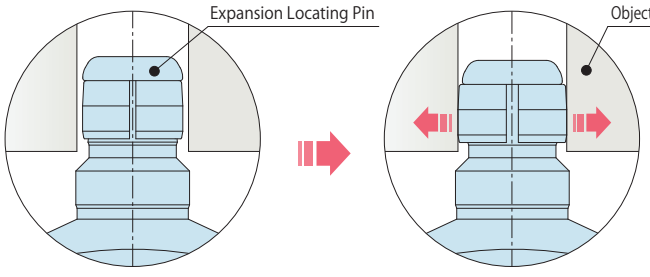
High Accuracy, Setup Time and Total Cost Reduction




### The World's First Locating Mechanism

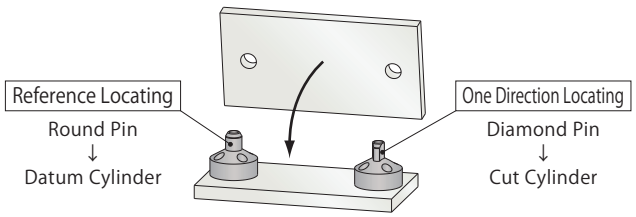
When expanded : Zero clearance between the pin and a workpiece hole allows for high accuracy locating.
When released : The pin diameter is retracted so there is enough clearance for easy loading and unloading of a workpiece.

## Action Description




※This drawing shows VFL and VFM.

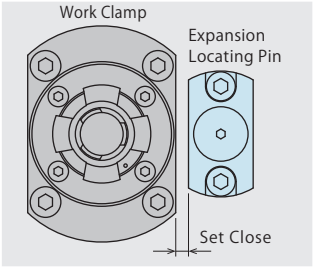
General Locating Pin consists of : Round Pin and Diamond Pin.
Kosmek Expansion Locating Pin consists of : Datum Cylinder and Cut Cylinder.



## Features

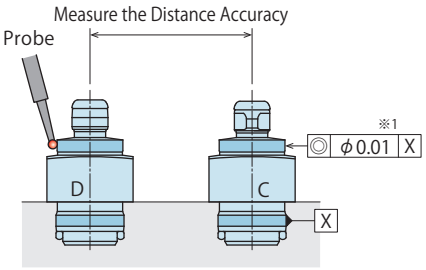
### ● Simple Arrangement

The compact body can be installed close to the clamp, so fixture design is more simple.




### ● Easy to Check the Accuracy

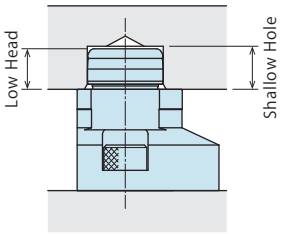
The same core part with X on the flange top allows to determine the origin and measure the distance accuracy.




※1. It is ϕ0.02 for VFJ / VFK.

### ● For Shallow Workpiece Hole

The low head pin can be used for shallow workpiece hole.

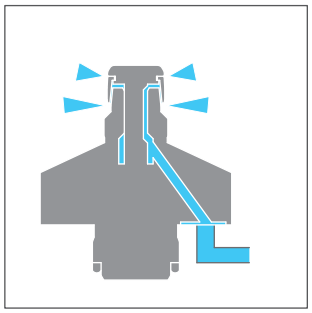



## Functions

### ● Air Blow Function

Equipped to All Options

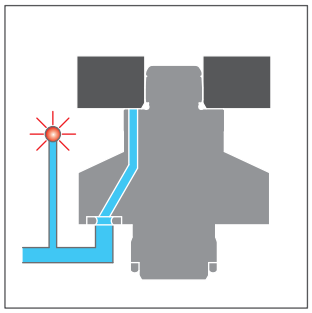
Prevent contamination.



### ● With Seating Surface (Seat Check)

Only for -B : With Seating Surface

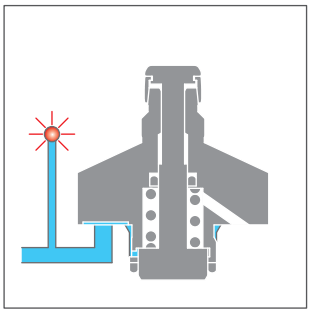
Seating confirmation is available by using a gap sensor.



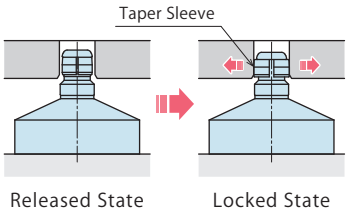
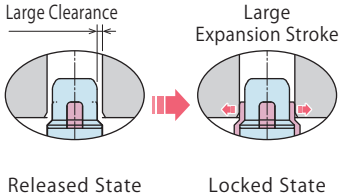
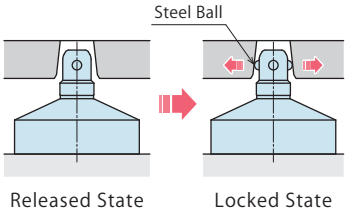
### ● Release Confirmation

Only for -M : Release Confirmation

Release confirmation is available by using a gap sensor.



※This drawing shows VFL.

| Low Pressure MAX. 7MPa | Model VFL → P.1003 | Model VFM → P.1019 | Model VFH Refer to the catalog on the website. | Model VFJ → P.1037 | Model VFK → P.1053 |
|---|---|---|---|---|---|
| Model/ Locating Repeatability | High Accuracy Model 3μm | | Multi-Purpose Model 10μm | Casting Material Model 10μm | |
| Control Method | Single Action (Spring Lock/Hyd. Release) | Double Action (Hyd. Lock/Hyd. Release) | Double Action (Hyd. Lock/Hyd. Release) | Single Action (Hyd. Lock/Spring Release) | Double Action (Hyd. Lock/Hyd. Release) |
| Op. Pressure | 2.5 ~ 7 MPa | | 1.5 ~ 7 MPa | 2.5 ~ 7 MPa | 1.5 ~ 7 MPa |
| Action |  Released State / Locked State | |  Released State / Locked State |  Released State / Locked State | |
| | The taper sleeve expands. | | Large Gripper Expansion | The steel balls come out from the pin. | |
| Application Examples | Finishing Line / Dividing Operation Line | | | Locating Casting Core Holes / First Process | |

# Hydraulic Expansion Locating Pin

## Model VFJ/VFK

**Hydraulic Single Action/Double Action**

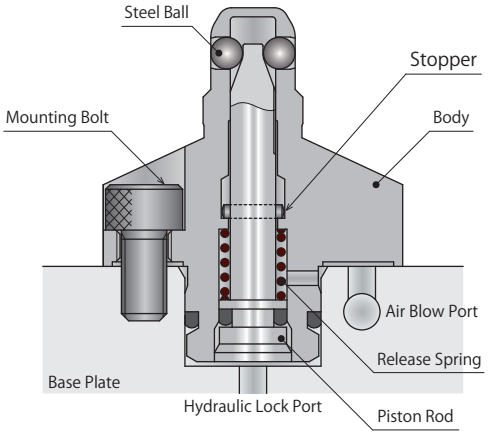
**Locating Repeatability : 10μm**


## Index

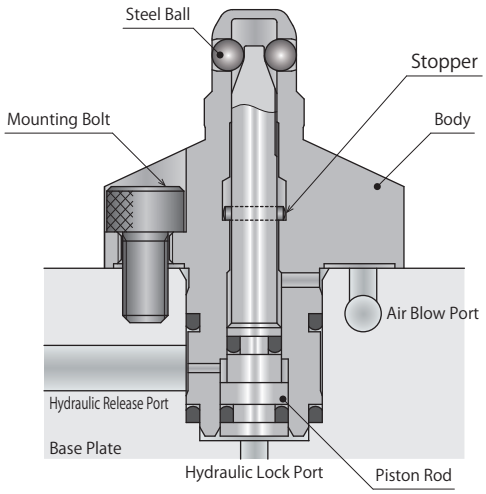
## Action Description

This is a simplified drawing of VFJ / VFK (Standard).

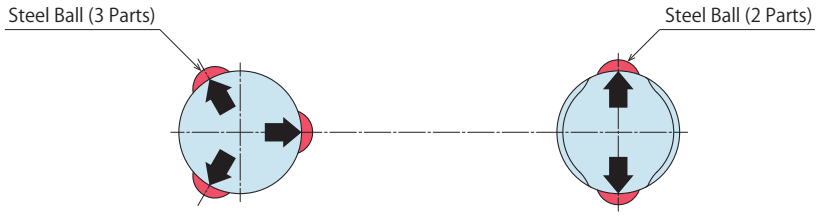
model VFJ




model VFK



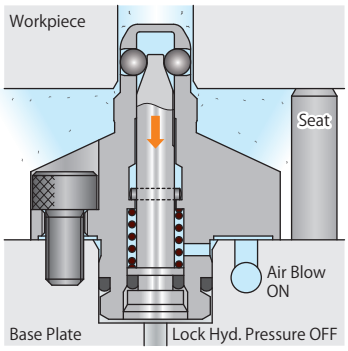

### About Reference Locating and Orientation




VFJ/VFK-D : Datum
Reference Locating

VFJ/VFK-C : Cut
One Direction Locating

model VFJ



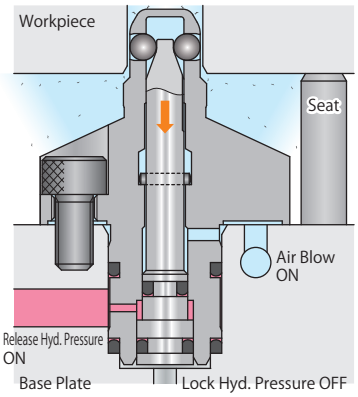

- VFJ : When lock hydraulic pressure is OFF, the piston rod descends and steel balls are free to move.
- VFK : When lock hydraulic pressure is OFF and release hydraulic pressure is ON, the piston rod descends and steel balls are free to move.
- Air blow prevents debris contamination.

※It is not a malfunction when the steel balls are expanded with air blow pressure.

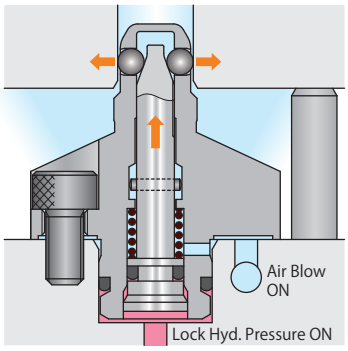
When loading workpiece

When unloading workpiece

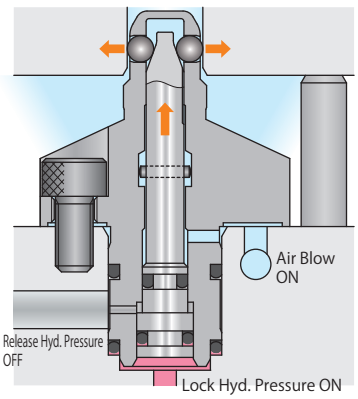
model VFK




When locating




- VFJ : When lock hydraulic pressure is ON, the piston rod is ascended and the steel balls are expanded to locate the workpiece.
- VFK : When release hydraulic pressure is OFF and lock hydraulic pressure is ON, the piston rod is ascended and the steel balls are expanded to locate the workpiece. (An additional seat is required for standard and release confirmation models.)



## Model No. Indication

VFJ **2** **00** **0** - **080** - **D** - **H20** - **M** **R**

1 2 3 4 5 6 7

## 1 Body Size

**2** : Select from Workpiece Hole Diameter ϕ7.6 ~ ϕ10.8

**3** : Select from Workpiece Hole Diameter ϕ10.4 ~ ϕ16.2

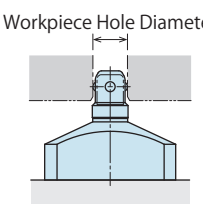
## 2 Design No.

**0** : Revision Number

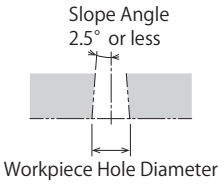
## 3 Workpiece Hole Diameter

| Workpiece Hole Diam. Code | | 080 | 090 | 100 | 110 | 120 | 130 | 140 | 150 |
|---|---|---|---|---|---|---|---|---|---|
| Workpiece Hole Diameter (mm) | Straight Hole | ϕ7.6 ~ ϕ8.5 | ϕ8.5 ~ ϕ9.5 | ϕ9.5 ~ ϕ10.8 | ϕ10.4 ~ ϕ12 | ϕ11.4 ~ ϕ13 | ϕ12.2 ~ ϕ14.1 | ϕ13.2 ~ ϕ15.1 | ϕ14 ~ ϕ16.2 |
| | Taper Hole | ϕ8 ~ ϕ8.5 | ϕ9 ~ ϕ9.5 | ϕ10 ~ ϕ10.8 | ϕ11 ~ ϕ12 | ϕ12 ~ ϕ13 | ϕ13 ~ ϕ14.1 | ϕ14 ~ ϕ15.1 | ϕ15 ~ ϕ16.2 |
| **VFJ2000** | | Selection Range | | | | | | | |
| **VFJ3000** | | | | | Selection Range | | | | |

**Straight Hole**



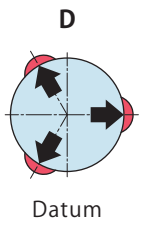

**Taper Hole**

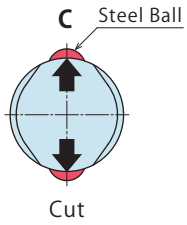



## 4 Functions

**D** : Datum (for Reference Locating)

**C** : Cut (for One Direction Locating)



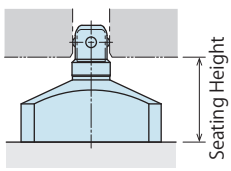




## 5 Seating Height

**H15** : 15mm

**H20** : 20mm

**H25** : 25mm




Note :

Prepare an additional seat for 6 Option **Blank** : Standard and **M** : Release Confirmation Model.

## 6 Options

**Blank** : None (Standard)

**B** : with Seating Surface

**M** : Release Confirmation Model

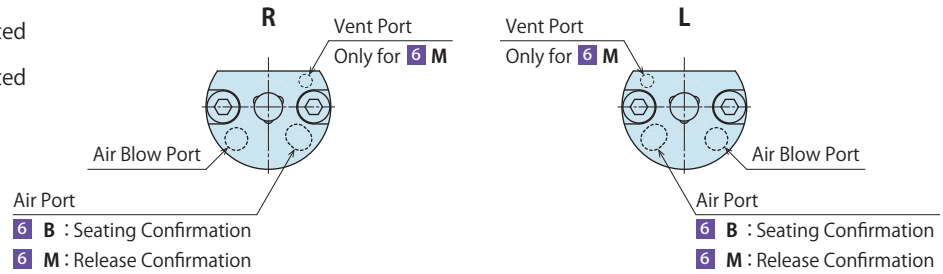
Note :
Contact us for combined use of **B** : with Seating Surface and **M** : Release Confirmation model.

## 7 Port Position

Only for 6 Options : **B** (with Seating Surface), and **M** (Release Confirmation Model)

**R** : As Illustrated

**L** : As Illustrated



## Specifications：VFJ2000

| Model No. | | | VFJ2000-080 | VFJ2000-090 | VFJ2000-100 |
|---|---|---|---|---|---|
| Workpiece Hole Diameter mm | Straight Hole | | φ7.6 ~ φ8.5 | φ8.5 ~ φ9.5 | φ9.5 ~ φ10.8 |
| | Taper Hole | | φ8 ~ φ8.5 | φ9 ~ φ9.5 | φ10 ~ φ10.8 |
| Locating Repeatability ※1 | | mm | 0.01 | | |
| Allowable Offset (C：Cut) | | mm | ±0.4 | ±0.4 | ±0.5 |
| Expanding Force (F) ※2 N | at 2.5MPa | | 110 | | |
| | at 5.0MPa | | 260 | | |
| | at 7.0MPa | | 380 | | |
| Allowable Thrust Load ※3 | | N | 450 | 600 | 800 |
| Cylinder Capacity (Empty Action) | | cm³ | 0.08 | 0.10 | 0.12 |
| Operating Pressure Range | | MPa | 2.5 ~ 7.0 | | |
| Withstanding Pressure | | MPa | 10.5 | | |
| Recommended Air Blow Pressure | | MPa | 0.3 ~ 0.4 | | |
| Operating Temperature Range | | ℃ | 0 ~ 70 | | |
| Usable Fluid | | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |

## Specifications：VFJ3000

| Model No. | | | VFJ3000-110 | VFJ3000-120 | VFJ3000-130 | VFJ3000-140 | VFJ3000-150 |
|---|---|---|---|---|---|---|---|
| Workpiece Hole Diameter mm | Straight Hole | | φ10.4 ~ φ12 | φ11.4 ~ φ13 | φ12.2 ~ φ14.1 | φ13.2 ~ φ15.1 | φ14 ~ φ16.2 |
| | Taper Hole | | φ11 ~ φ12 | φ12 ~ φ13 | φ13 ~ φ14.1 | φ14 ~ φ15.1 | φ15 ~ φ16.2 |
| Locating Repeatability ※1 | | mm | 0.01 | | | | |
| Allowable Offset (C：Cut) | | mm | ±0.6 | ±0.6 | ±0.7 | ±0.7 | ±0.8 |
| Expanding Force (F) ※2 N | at 2.5MPa | | 250 | | | | |
| | at 5.0MPa | | 580 | | | | |
| | at 7.0MPa | | 840 | | | | |
| Allowable Thrust Load ※3 | | N | 1000 | 1000 | 1300 | 1300 | 1800 |
| Cylinder Capacity (Empty Action) | | cm³ | 0.29 | 0.29 | 0.32 | 0.32 | 0.36 |
| Operating Pressure Range | | MPa | 2.5 ~ 7.0 | | | | |
| Withstanding Pressure | | MPa | 10.5 | | | | |
| Recommended Air Blow Pressure | | MPa | 0.3 ~ 0.4 | | | | |
| Operating Temperature Range | | ℃ | 0 ~ 70 | | | | |
| Usable Fluid | | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | |

Notes：

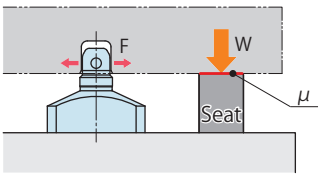
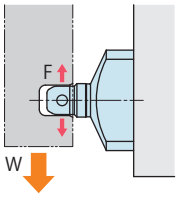
※1. It shows locating repeatability under the specific condition (no load).

※2. Expanding force shows the calculated value when coefficient friction is μ0.1.
Refer to the next page for the relative equation of expanding force and allowable workpiece weight for locating.

※3. Exceeding allowable thrust load leads to accuracy failure and/or damages on the product.

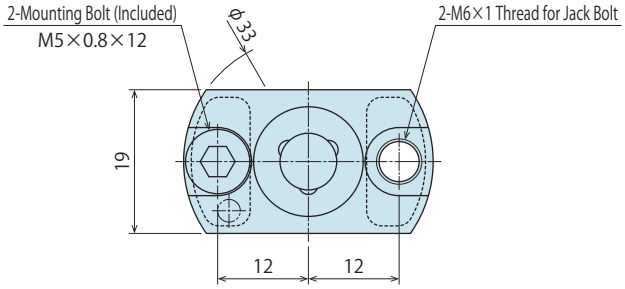
1. This product locates with hydraulic pressure and releases with spring. (Hydraulic Pressure Single Action)
2. This cylinder is used only for locating and does not have a clamping function.

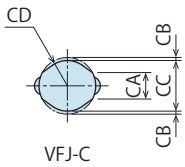
## Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

| Horizontal Attitude | Vertical Attitude |
|---|---|
|  |  |
| Workpiece Weight (W) ≦ $\frac{\text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency 0.5}}{\text{Friction Coefficient of Workpiece Seat Face } (\mu)}$ | Workpiece Weight (W) ≦ Expanding Force per Expansion Locating Pin (F) × Efficiency 0.5 |

## External Dimensions

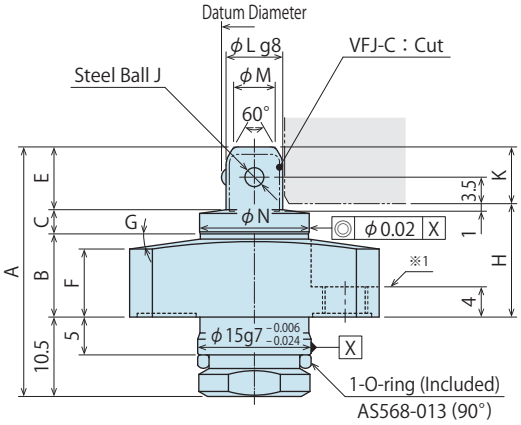
※This drawing shows VFJ2000 clamping action without workpiece.



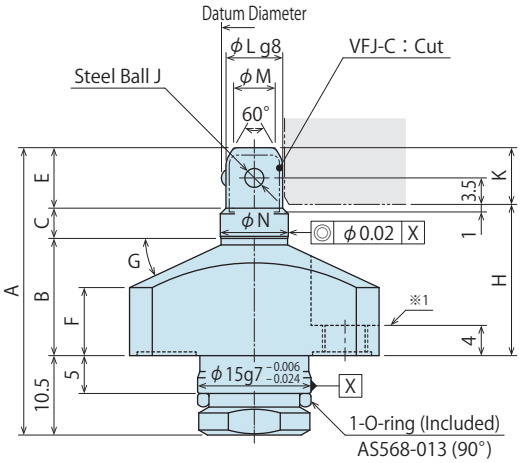




VFJ-C
(Cut : One Direction Locating)

5 Seating Height : **H15**

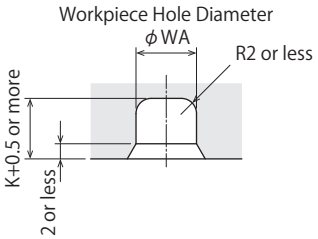



5 Seating Height : **H20 / H25**

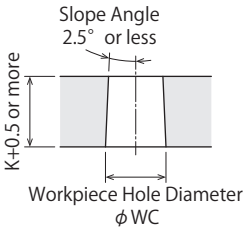


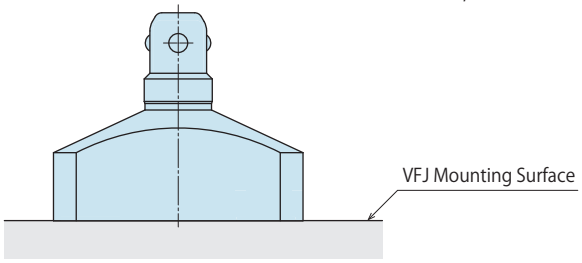

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



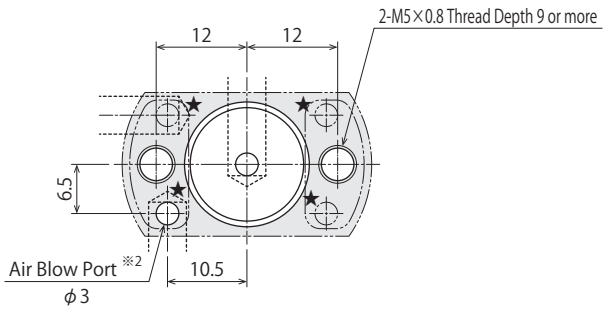



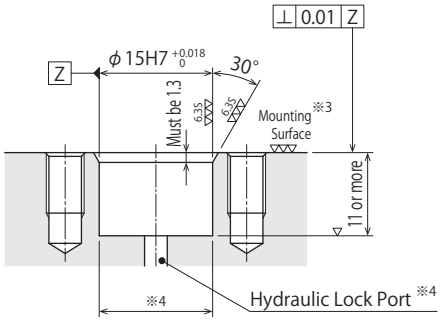

Notes :

※1. Do not use spring washer or toothed lock washer.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly. Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

## Machining Dimensions for Mounting




Notes：

※2. Install the air blow port choosing one port from four ★ parts.

※3. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※4. Prepare the hydraulic lock port on the bottom within the range of ϕ15.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

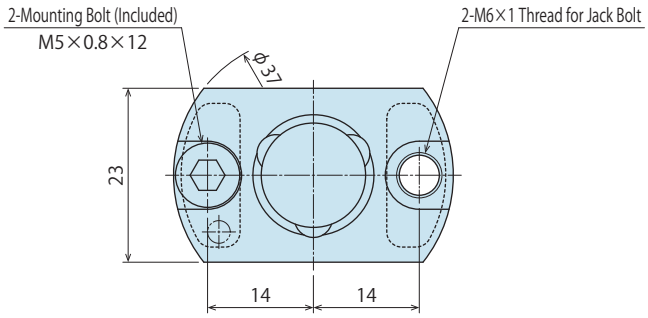
## External Dimensions and Machining Dimensions for Mounting

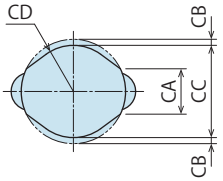
(mm)

| Model No. | | VFJ2000-080-□-□ | | | VFJ2000-090-□-□ | | | VFJ2000-100-□-□ | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 Workpiece Hole Diam. Code | 080 | | | 090 | | | 100 | | |
| | 5 Seating Height | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 7.6 ~ 8.5 | | | 8.5 ~ 9.5 | | | 9.5 ~ 10.8 | | |
| | WC (Taper Hole) | 8 ~ 8.5 | | | 9 ~ 9.5 | | | 10 ~ 10.8 | | |
| Datum Diameter | At Releasing | ϕ7.5 or less | | | ϕ8.3 or less | | | ϕ9.3 or less | | |
| | At Full Stroke | ϕ8.5 or more | | | ϕ9.5 or more | | | ϕ10.8 or more | | |
| Cylinder Stroke | | 1.8 | | | 2.2 | | | 2.6 | | |
| A | | 33 | 38 | 43 | 33.5 | 38.5 | 43.5 | 34 | 39 | 44 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 |
| E | | 8.3 | 8 | 8 | 8.8 | 8.5 | 8.5 | 9.3 | 9 | 9 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 2.5 | | | 3 | | | 3.5 | | |
| K | | 7.5 | | | 8 | | | 8.5 | | |
| L | | $7.5^{-0.005}_{-0.027}$ | | | $8.3^{-0.005}_{-0.027}$ | | | $9.3^{-0.005}_{-0.027}$ | | |
| M | | 5.5 | | | 6 | | | 6.5 | | |
| N | | 14.5 | 9 | 9 | 14.5 | 10 | 10 | 14.5 | 11 | 11 |
| CA | | 3.5 | | | 4 | | | 4.5 | | |
| CB | | 0.4 | | | 0.4 | | | 0.5 | | |
| CC | | 6.7 | | | 7.5 | | | 8.3 | | |
| CD | | R3.35 | | | R3.75 | | | R4.15 | | |
| Weight | g | 60 | 70 | 80 | 60 | 70 | 80 | 60 | 70 | 90 |

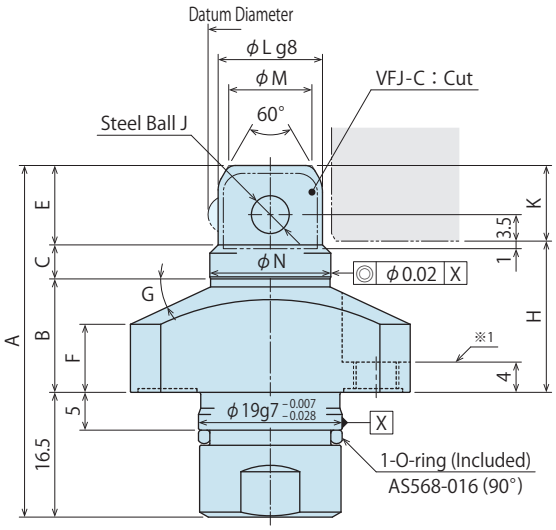
## External Dimensions

※This drawing shows VFJ3000 clamping action without workpiece.



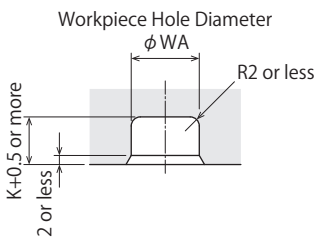




VFJ-C
(Cut : One Direction Locating)

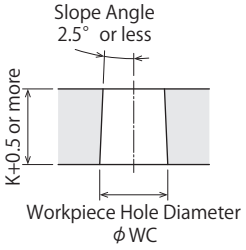


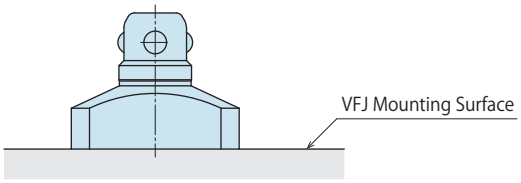

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



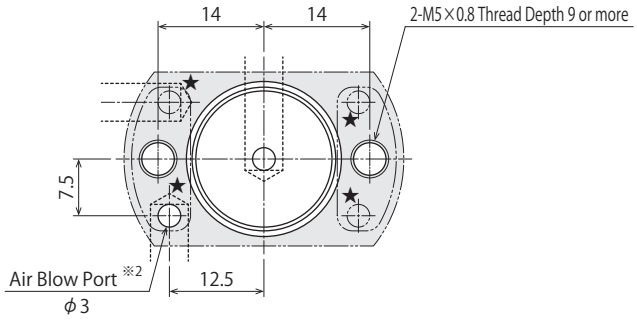



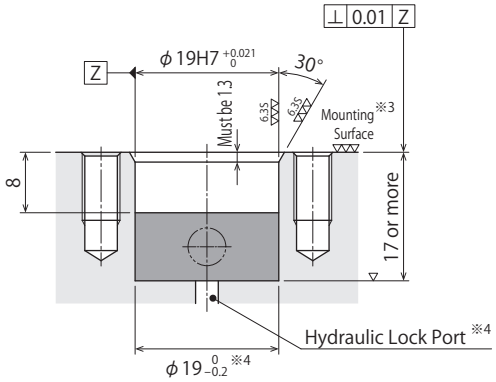

Notes :

※1. Do not use spring washer or toothed lock washer.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly. Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

## Machining Dimensions for Mounting




Notes：

※2. Install the air blow port choosing one port from four ★ parts.

※3. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※4. Prepare the hydraulic lock port on the bottom within the range of ϕ19, or within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

## External Dimensions and Machining Dimensions for Mounting

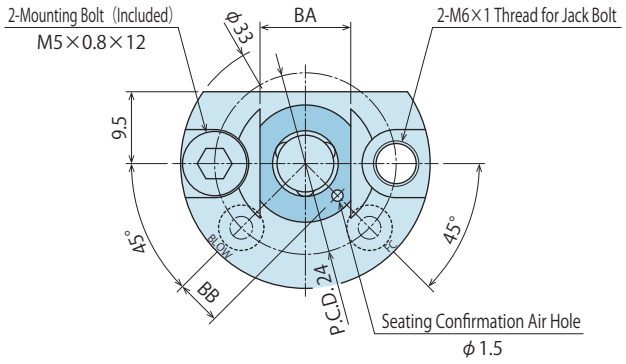
(mm)

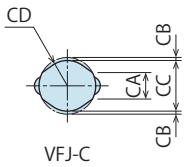
| Model No. | | VFJ3000-110-□-□ | | | VFJ3000-120-□-□ | | | VFJ3000-130-□-□ | | | VFJ3000-140-□-□ | | | VFJ3000-150-□-□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 Workpiece Hole Diam. Code | 110 | | | 120 | | | 130 | | | 140 | | | 150 | | |
| | 5 Seating Height | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 10.4 ~ 12 | | | 11.4 ~ 13 | | | 12.2 ~ 14.1 | | | 13.2 ~ 15.1 | | | 14 ~ 16.2 | | |
| | WC (Taper Hole) | 11 ~ 12 | | | 12 ~ 13 | | | 13 ~ 14.1 | | | 14 ~ 15.1 | | | 15 ~ 16.2 | | |
| Datum Diameter | At Releasing | ϕ10.2 or less | | | ϕ11.2 or less | | | ϕ12.0 or less | | | ϕ13.0 or less | | | ϕ13.8 or less | | |
| | At Full Stroke | ϕ12.0 or more | | | ϕ13.0 or more | | | ϕ14.1 or more | | | ϕ15.1 or more | | | ϕ16.2 or more | | |
| Cylinder Stroke | | 3 | | | 3 | | | 3.4 | | | 3.4 | | | 3.8 | | |
| A | | 40.5 | 45.5 | 50.5 | 40.5 | 45.5 | 50.5 | 41 | 46 | 51 | 41 | 46 | 51 | 41.5 | 46.5 | 51.5 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15 | 20 | 11 | 15 | 20 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4.5 | 4.5 | 3.2 | 4.5 | 4.5 |
| E | | 9.8 | 9.5 | 9.5 | 9.8 | 9.5 | 9.5 | 10.3 | 10 | 10 | 10.3 | 10 | 10 | 10.8 | 10.5 | 10.5 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 4 | | | 4 | | | 4.5 | | | 4.5 | | | 5 | | |
| K | | 9 | | | 9 | | | 9.5 | | | 9.5 | | | 10 | | |
| L | | 10.2 $^{-0.006}_{-0.033}$ | | | 11.2 $^{-0.006}_{-0.033}$ | | | 12.0 $^{-0.006}_{-0.033}$ | | | 13.0 $^{-0.006}_{-0.033}$ | | | 13.8 $^{-0.006}_{-0.033}$ | | |
| M | | 7.4 | | | 8.4 | | | 9.2 | | | 10.2 | | | 11.0 | | |
| N | | 18.5 | 12 | 12 | 18.5 | 13 | 13 | 18.5 | 14 | 14 | 18.5 | 15 | 15 | 18.5 | 16 | 16 |
| CA | | 5 | | | 5 | | | 5.5 | | | 5.5 | | | 6 | | |
| CB | | 0.6 | | | 0.6 | | | 0.7 | | | 0.7 | | | 0.8 | | |
| CC | | 9 | | | 10 | | | 10.6 | | | 11.6 | | | 12.2 | | |
| CD | | R4.5 | | | R5 | | | R5.3 | | | R5.8 | | | R6.1 | | |
| Weight | g | 100 | 110 | 130 | 100 | 110 | 130 | 100 | 120 | 130 | 100 | 120 | 130 | 100 | 120 | 130 |

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

## External Dimensions

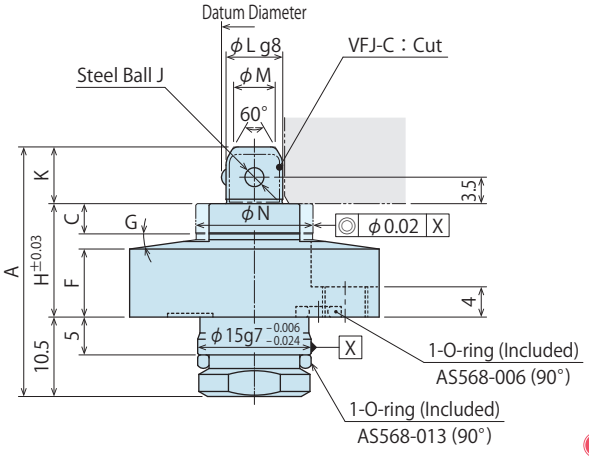
※This drawing shows VFJ2000-BR clamping action without workpiece.
The ports of VFJ2000-BL are placed to the symmetrical positions of this drawing.



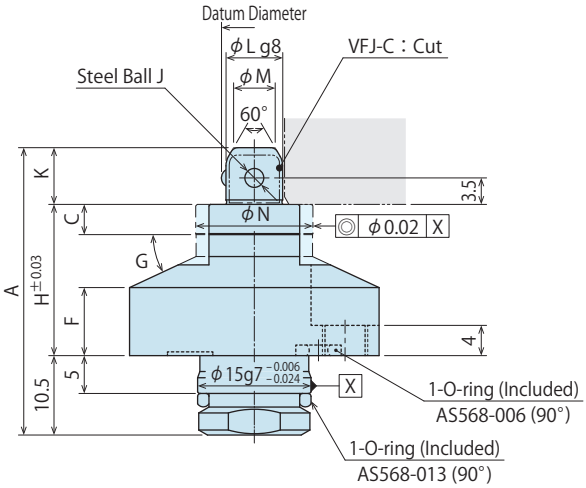




VFJ-C
(Cut：One Direction Locating)

5 Seating Height：**H15**

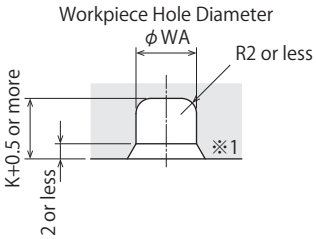



5 Seating Height：**H20 / H25**

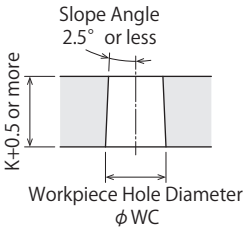


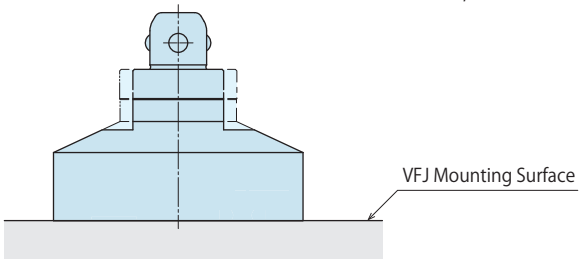

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



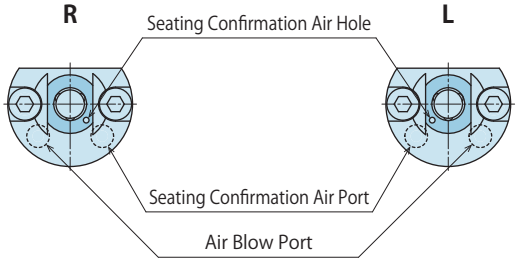




Notes：

※1. Please note that if the chamfer of the workpiece hole end is large, the seating confirmation air may not be increased.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (BLOW：Air Blow Port, FC：Seating Confirmation Air Port)
   Continuously supply air pressure to the air blow port and seating confirmation air port.

## Port Position

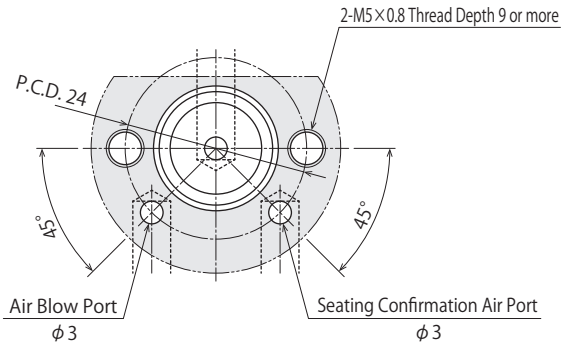



Note：

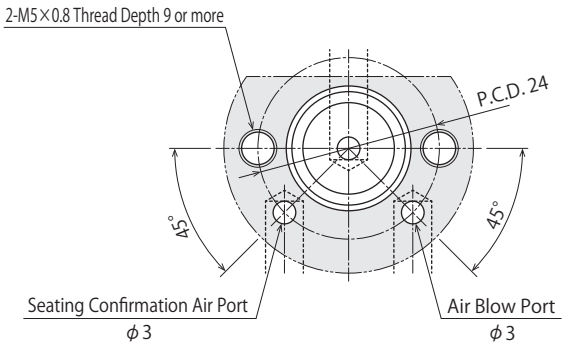
3. Please make sure that the port positions are correct.

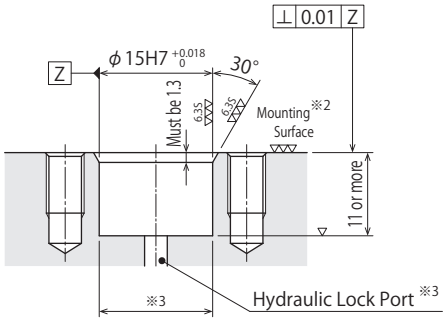
## Machining Dimensions for Mounting

7 Port Position : R




7 Port Position : L




Notes :

※2. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※3. Prepare the hydraulic lock port on the bottom within the range of ϕ15.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

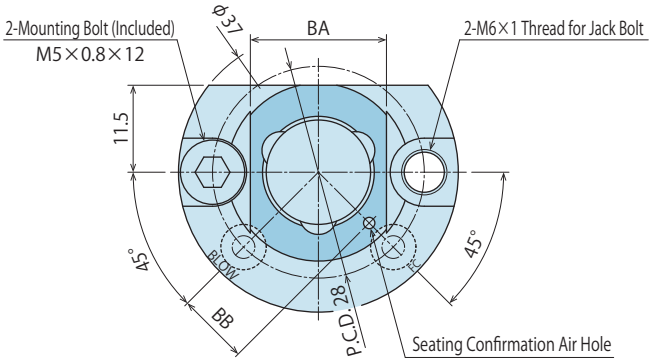
## External Dimensions and Machining Dimensions for Mounting

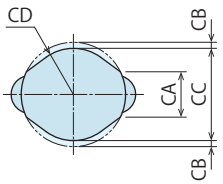
(mm)

| Model No. | | VFJ2000-080-□-□-B□ | | | VFJ2000-090-□-□-B□ | | | VFJ2000-100-□-□-B□ | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 Workpiece Hole Diam. Code | 080 | | | 090 | | | 100 | | |
| | 5 Seating Height | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 7.6 ~ 8.5 | | | 8.5 ~ 9.5 | | | 9.5 ~ 10.8 | | |
| | WC (Taper Hole) | 8 ~ 8.5 | | | 9 ~ 9.5 | | | 10 ~ 10.8 | | |
| Datum Diameter | At Releasing | ϕ7.5 or less | | | ϕ8.3 or less | | | ϕ9.3 or less | | |
| | At Full Stroke | ϕ8.5 or more | | | ϕ9.5 or more | | | ϕ10.8 or more | | |
| Cylinder Stroke | | 1.8 | | | 2.2 | | | 2.6 | | |
| A | | 33 | 38 | 43 | 33.5 | 38.5 | 43.5 | 34 | 39 | 44 |
| C | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 2.5 | | | 3 | | | 3.5 | | |
| K | | 7.5 | | | 8 | | | 8.5 | | |
| L | | 7.5 $^{-0.005}_{-0.027}$ | | | 8.3 $^{-0.005}_{-0.027}$ | | | 9.3 $^{-0.005}_{-0.027}$ | | |
| M | | 5.5 | | | 6 | | | 6.5 | | |
| N | | 15.5 | 15.5 | 15.5 | 16.5 | 16.5 | 16.5 | 17.5 | 17.5 | 17.5 |
| BA | | 12 | | | 13 | | | 14 | | |
| BB | | 6 | | | 6.5 | | | 7 | | |
| CA | | 3.5 | | | 4 | | | 4.5 | | |
| CB | | 0.4 | | | 0.4 | | | 0.5 | | |
| CC | | 6.7 | | | 7.5 | | | 8.3 | | |
| CD | | R3.35 | | | R3.75 | | | R4.15 | | |
| Weight | g | 70 | 80 | 100 | 70 | 80 | 100 | 70 | 80 | 100 |

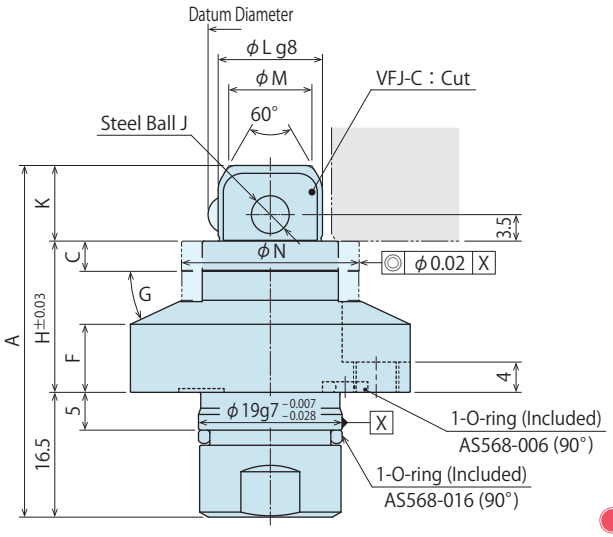
## External Dimensions

※This drawing shows VFJ3000-BR clamping action without workpiece.
The ports of VFJ3000-BL are placed to the symmetrical positions of this drawing.

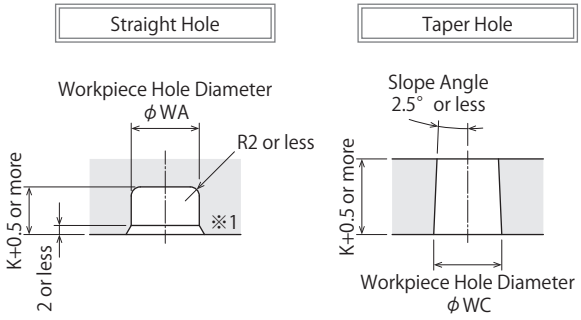


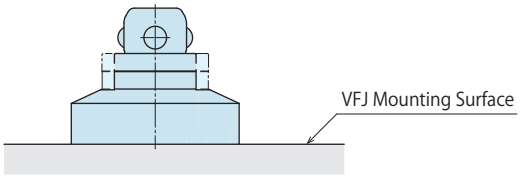




VFJ-C
(Cut：One Direction Locating)




## Workpiece Hole Dimensions



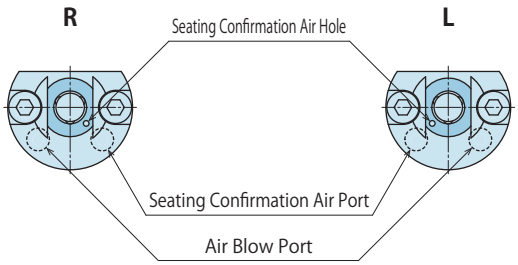




Notes：

※1. Please note that if the chamfer of the workpiece hole end is large, the seating confirmation air may not be increased.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (BLOW：Air Blow Port, FC：Seating Confirmation Air Port)
   Continuously supply air pressure to the air blow port and seating confirmation air port.

## Port Position

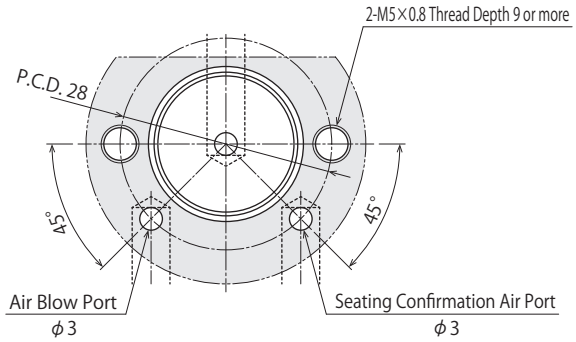



Note：

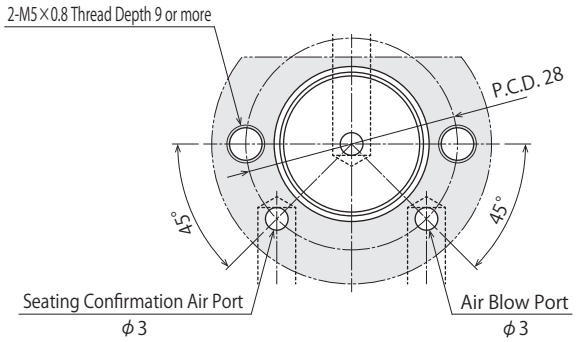
3. Please make sure that the port positions are correct.

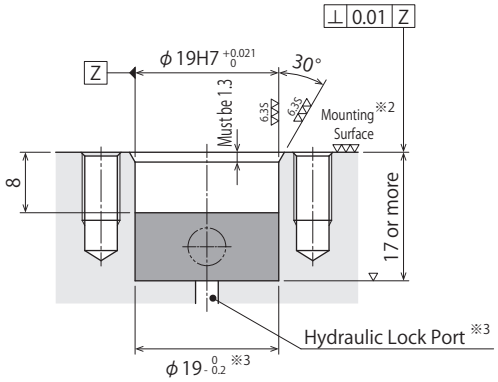
## Machining Dimensions for Mounting

7 Port Position : R




7 Port Position : L




Notes :

※2. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※3. Prepare the hydraulic lock port on the bottom within the range of ϕ19, or within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

## External Dimensions and Machining Dimensions for Mounting

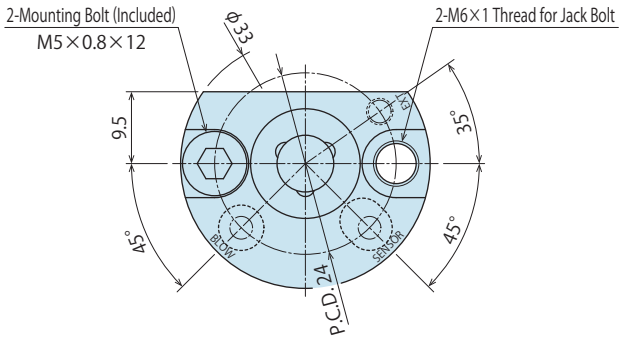
(mm)

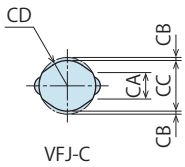
| Model No. | | VFJ3000-110-□-□-B□ | | | VFJ3000-120-□-□-B□ | | | VFJ3000-130-□-□-B□ | | | VFJ3000-140-□-□-B□ | | | VFJ3000-150-□-□-B□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 Workpiece Hole Diam. Code | | 110 | | | 120 | | | 130 | | | 140 | | | 150 | | |
| 5 Seating Height | | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 10.4 ~ 12 | | | 11.4 ~ 13 | | | 12.2 ~ 14.1 | | | 13.2 ~ 15.1 | | | 14 ~ 16.2 | | |
| | WC (Taper Hole) | 11 ~ 12 | | | 12 ~ 13 | | | 13 ~ 14.1 | | | 14 ~ 15.1 | | | 15 ~ 16.2 | | |
| Datum Diameter | At Releasing | ϕ10.2 or less | | | ϕ11.2 or less | | | ϕ12.0 or less | | | ϕ13.0 or less | | | ϕ13.8 or less | | |
| | At Full Stroke | ϕ12.0 or more | | | ϕ13.0 or more | | | ϕ14.1 or more | | | ϕ15.1 or more | | | ϕ16.2 or more | | |
| Cylinder Stroke | | 3 | | | 3 | | | 3.4 | | | 3.4 | | | 3.8 | | |
| A | | 40.5 | 45.5 | 50.5 | 40.5 | 45.5 | 50.5 | 41 | 46 | 51 | 41 | 46 | 51 | 41.5 | 46.5 | 51.5 |
| C | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 4 | | | 4 | | | 4.5 | | | 4.5 | | | 5 | | |
| K | | 9 | | | 9 | | | 9.5 | | | 9.5 | | | 10 | | |
| L | | 10.2 -0.006 -0.033 | | | 11.2 -0.006 -0.033 | | | 12.0 -0.006 -0.033 | | | 13.0 -0.006 -0.033 | | | 13.8 -0.006 -0.033 | | |
| M | | 7.4 | | | 8.4 | | | 9.2 | | | 10.2 | | | 11.0 | | |
| N | | 19.5 | 19.5 | 19.5 | 20.5 | 20.5 | 20.5 | 21.5 | 21.5 | 21.5 | 22.5 | 22.5 | 22.5 | 23.5 | 23.5 | 23.5 |
| BA | | 15 | | | 16 | | | 17 | | | 17 | | | 18 | | |
| BB | | 8 | | | 8.5 | | | 9 | | | 9.5 | | | 10 | | |
| CA | | 5 | | | 5 | | | 5.5 | | | 5.5 | | | 6 | | |
| CB | | 0.6 | | | 0.6 | | | 0.7 | | | 0.7 | | | 0.8 | | |
| CC | | 9 | | | 10 | | | 10.6 | | | 11.6 | | | 12.2 | | |
| CD | | R4.5 | | | R5 | | | R5.3 | | | R5.8 | | | R6.1 | | |
| Weight | g | 110 | 120 | 140 | 110 | 130 | 140 | 110 | 130 | 140 | 110 | 130 | 150 | 110 | 130 | 150 |

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

## External Dimensions

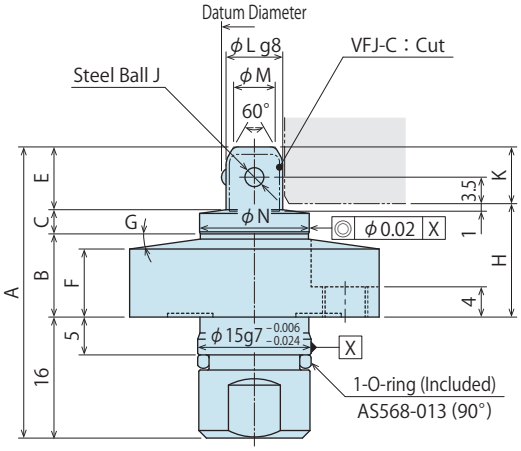
※This drawing shows VFJ2000-MR clamping action without workpiece.
The ports of VFJ2000-ML are placed to the symmetrical positions of this drawing.



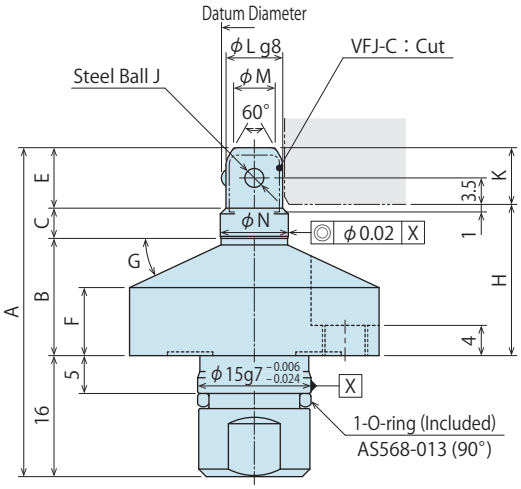




VFJ-C
(Cut : One Direction Locating)

5 Seating Height : **H15**

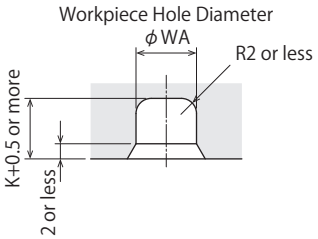



5 Seating Height : **H20 / H25**

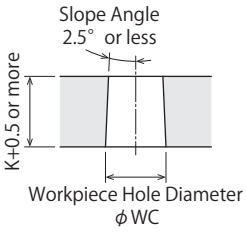


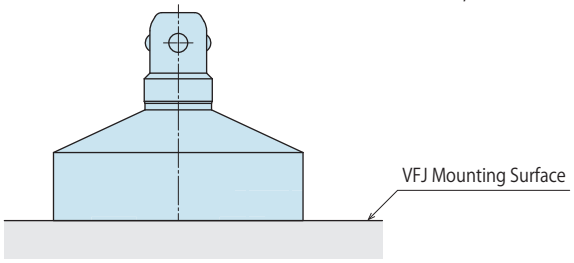

## Workpiece Hole Dimensions

Straight Hole




Taper Hole

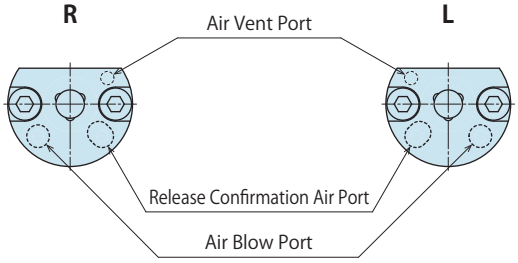



Notes :

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (EXT : Air Vent Port, BLOW : Air Blow Port,
   SENSOR : Release Confirmation Air Port)
   Continuously supply air pressure to the air blow port and release confirmation air port.
3. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

## Port Position

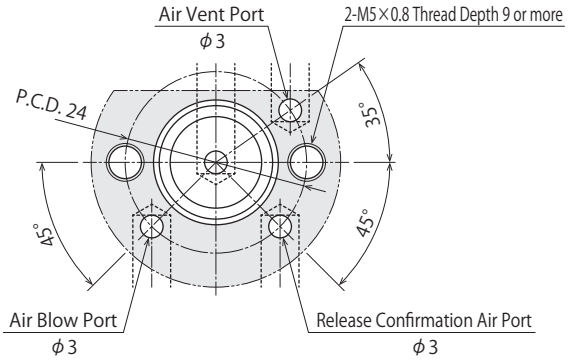



Note :

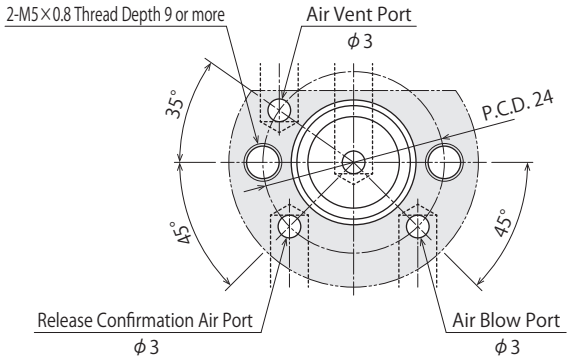
4. Please make sure that the port positions are correct.

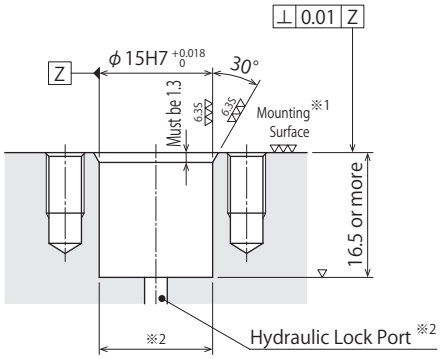
## Machining Dimensions for Mounting

7 Port Position : R




7 Port Position : L




Notes :

※1. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※2. Prepare the hydraulic lock port on the bottom within the range of φ15.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

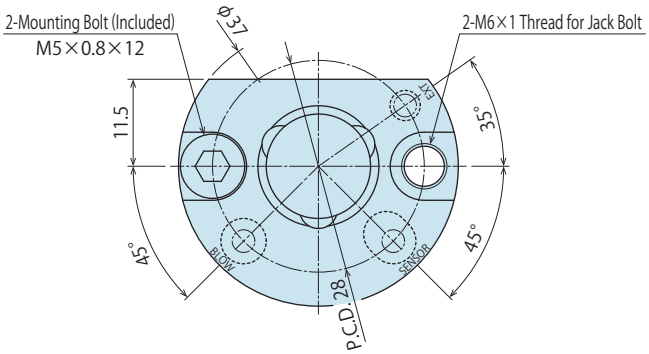
## External Dimensions and Machining Dimensions for Mounting

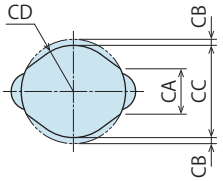
(mm)

| Model No. | | VFJ2000-080-□-□-M□ | | | VFJ2000-090-□-□-M□ | | | VFJ2000-100-□-□-M□ | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 Workpiece Hole Diam. Code | | 080 | | | 090 | | | 100 | | |
| 5 Seating Height | | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 7.6 ~ 8.5 | | | 8.5 ~ 9.5 | | | 9.5 ~ 10.8 | | |
| | WC (Taper Hole) | 8 ~ 8.5 | | | 9 ~ 9.5 | | | 10 ~ 10.8 | | |
| Datum Diameter | At Releasing | φ7.5 or less | | | φ8.3 or less | | | φ9.3 or less | | |
| | At Full Stroke | φ8.5 or more | | | φ9.5 or more | | | φ10.8 or more | | |
| Cylinder Stroke | | 1.8 | | | 2.2 | | | 2.6 | | |
| A | | 38.5 | 43.5 | 48.5 | 39 | 44 | 49 | 39.5 | 44.5 | 49.5 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 |
| E | | 8.3 | 8 | 8 | 8.8 | 8.5 | 8.5 | 9.3 | 9 | 9 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 2.5 | | | 3 | | | 3.5 | | |
| K | | 7.5 | | | 8 | | | 8.5 | | |
| L | | 7.5 $^{-0.005}_{-0.027}$ | | | 8.3 $^{-0.005}_{-0.027}$ | | | 9.3 $^{-0.005}_{-0.027}$ | | |
| M | | 5.5 | | | 6 | | | 6.5 | | |
| N | | 14.5 | 9 | 9 | 14.5 | 10 | 10 | 14.5 | 11 | 11 |
| CA | | 3.5 | | | 4 | | | 4.5 | | |
| CB | | 0.4 | | | 0.4 | | | 0.5 | | |
| CC | | 6.7 | | | 7.5 | | | 8.3 | | |
| CD | | R3.35 | | | R3.75 | | | R4.15 | | |
| Weight | g | 70 | 100 | 110 | 70 | 100 | 110 | 80 | 100 | 110 |

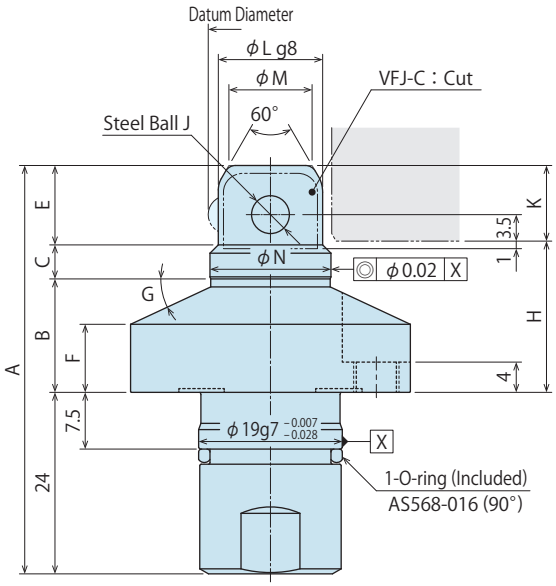
## External Dimensions

※ This drawing shows VFJ3000-MR clamping action without workpiece. The ports of VFJ3000-ML are placed to the symmetrical positions of this drawing.

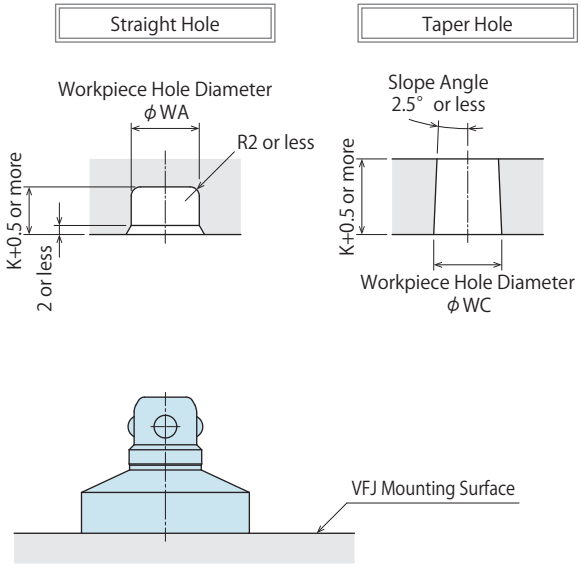



VFJ-C
(Cut : One Direction Locating)



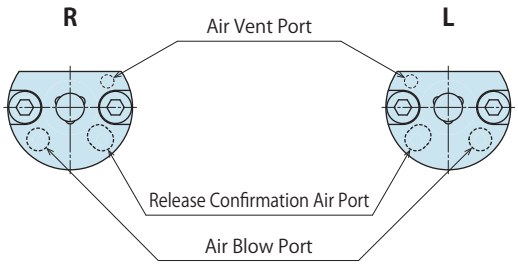

## Workpiece Hole Dimensions




Notes :

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly. Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface. (EXT : Air Vent Port, BLOW : Air Blow Port, SENSOR : Release Confirmation Air Port) Continuously supply air pressure to the air blow port and release confirmation air port.
3. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

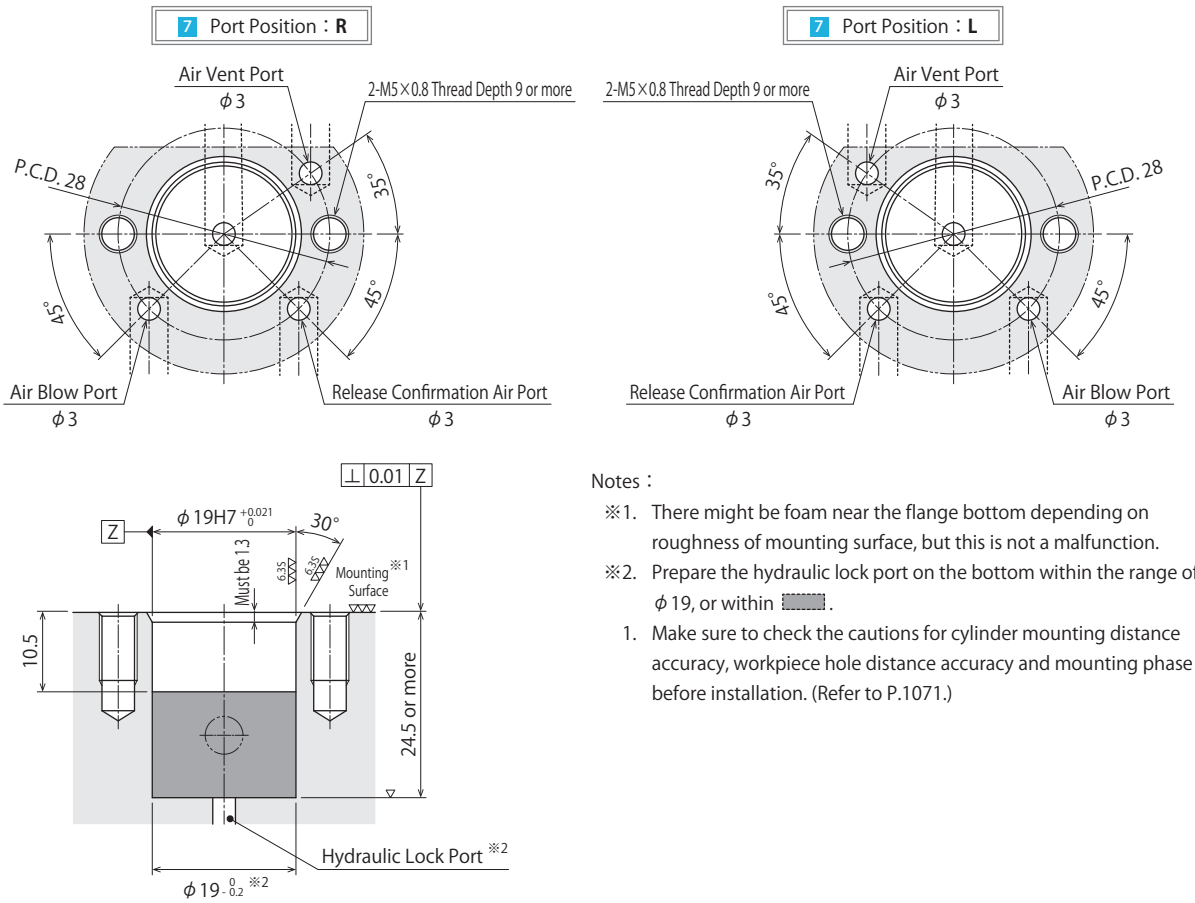
## Port Position




Note :

4. Please make sure that the port positions are correct.

## Machining Dimensions for Mounting




Notes :

※1. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※2. Prepare the hydraulic lock port on the bottom within the range of φ19, or within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No. | | VFJ3000-110-□-□-M□ | | | VFJ3000-120-□-□-M□ | | | VFJ3000-130-□-□-M□ | | | VFJ3000-140-□-□-M□ | | | VFJ3000-150-□-□-M□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 Workpiece Hole Diam. Code | 110 | | | 120 | | | 130 | | | 140 | | | 150 | | |
| | 5 Seating Height | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 10.4 ~ 12 | | | 11.4 ~ 13 | | | 12.2 ~ 14.1 | | | 13.2 ~ 15.1 | | | 14 ~ 16.2 | | |
| | WC (Taper Hole) | 11 ~ 12 | | | 12 ~ 13 | | | 13 ~ 14.1 | | | 14 ~ 15.1 | | | 15 ~ 16.2 | | |
| Datum Diameter | At Releasing | φ10.2 or less | | | φ11.2 or less | | | φ12.0 or less | | | φ13.0 or less | | | φ13.8 or less | | |
| | At Full Stroke | φ12.0 or more | | | φ13.0 or more | | | φ14.1 or more | | | φ15.1 or more | | | φ16.2 or more | | |
| Cylinder Stroke | | 3 | | | 3 | | | 3.4 | | | 3.4 | | | 3.8 | | |
| A | | 48 | 53 | 58 | 48 | 53 | 58 | 48.5 | 53.5 | 58.5 | 48.5 | 53.5 | 58.5 | 49 | 54 | 59 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15 | 20 | 11 | 15 | 20 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4.5 | 4.5 | 3.2 | 4.5 | 4.5 |
| E | | 9.8 | 9.5 | 9.5 | 9.8 | 9.5 | 9.5 | 10.3 | 10 | 10 | 10.3 | 10 | 10 | 10.8 | 10.5 | 10.5 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 4 | | | 4 | | | 4.5 | | | 4.5 | | | 5 | | |
| K | | 9 | | | 9 | | | 9.5 | | | 9.5 | | | 10 | | |
| L | | 10.2 -0.006 -0.033 | | | 11.2 -0.006 -0.033 | | | 12.0 -0.006 -0.033 | | | 13.0 -0.006 -0.033 | | | 13.8 -0.006 -0.033 | | |
| M | | 7.4 | | | 8.4 | | | 9.2 | | | 10.2 | | | 11.0 | | |
| N | | 18.5 | 12 | 12 | 18.5 | 13 | 13 | 18.5 | 14 | 14 | 18.5 | 15 | 15 | 18.5 | 16 | 16 |
| CA | | 5 | | | 5 | | | 5.5 | | | 5.5 | | | 6 | | |
| CB | | 0.6 | | | 0.6 | | | 0.7 | | | 0.7 | | | 0.8 | | |
| CC | | 9 | | | 10 | | | 10.6 | | | 11.6 | | | 12.2 | | |
| CD | | R4.5 | | | R5 | | | R5.3 | | | R5.8 | | | R6.1 | | |
| Weight | g | 150 | 170 | 190 | 150 | 170 | 190 | 150 | 170 | 190 | 150 | 170 | 190 | 160 | 170 | 190 |

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

## Model No. Indication

VFK **2** **00** **0** - **080** - **D** - **H20** - **M** **R**

1 2 3 4 5 6 7

## 1 Body Size

**2** : Select from Workpiece Hole Diameter ϕ7.6 ~ ϕ10.8

**3** : Select from Workpiece Hole Diameter ϕ10.4 ~ ϕ16.2

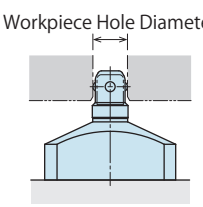
## 2 Design No.

**0** : Revision Number

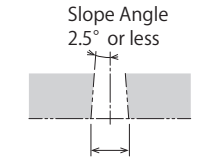
## 3 Workpiece Hole Diameter

| Workpiece Hole Diam. Code | | 080 | 090 | 100 | 110 | 120 | 130 | 140 | 150 |
|---|---|---|---|---|---|---|---|---|---|
| Workpiece Hole Diameter (mm) | Straight Hole | ϕ7.6 ~ ϕ8.5 | ϕ8.5 ~ ϕ9.5 | ϕ9.5 ~ ϕ10.8 | ϕ10.4 ~ ϕ12 | ϕ11.4 ~ ϕ13 | ϕ12.2 ~ ϕ14.1 | ϕ13.2 ~ ϕ15.1 | ϕ14 ~ ϕ16.2 |
| | Taper Hole | ϕ8 ~ ϕ8.5 | ϕ9 ~ ϕ9.5 | ϕ10 ~ ϕ10.8 | ϕ11 ~ ϕ12 | ϕ12 ~ ϕ13 | ϕ13 ~ ϕ14.1 | ϕ14 ~ ϕ15.1 | ϕ15 ~ ϕ16.2 |
| **VFK2000** | | Selection Range | | | | | | | |
| **VFK3000** | | | | | Selection Range | | | | |

**Straight Hole**



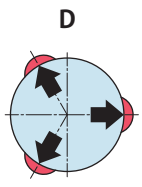

**Taper Hole**

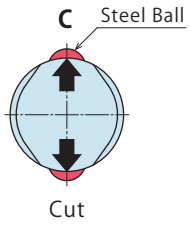



## 4 Functions

**D** : Datum (for Reference Locating)

**C** : Cut (for One Direction Locating)



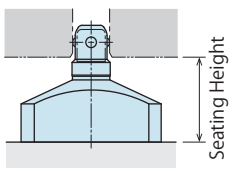




## 5 Seating Height

**H15** : 15mm

**H20** : 20mm

**H25** : 25mm




Note :

Prepare an additional seat for 6 Option **Blank** : Standard and **M** : Release Confirmation Model.

## 6 Options

**Blank** : None (Standard)

**B** : with Seating Surface

**M** : Release Confirmation Model

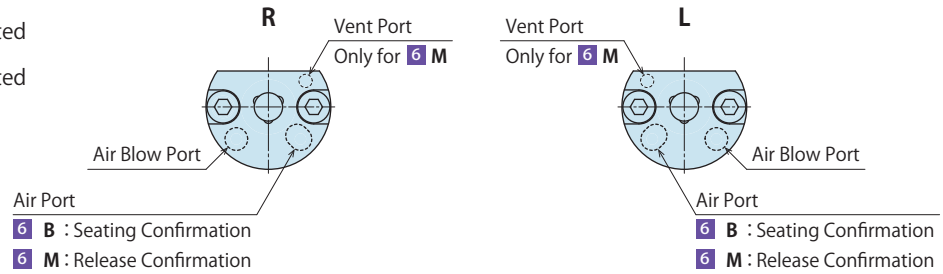
Note :
Contact us for combined use of **B** : with Seating Surface and **M** : Release Confirmation model.

## 7 Port Position

Only for 6 Options : **B** (with Seating Surface), and **M** (Release Confirmation Model)

**R** : As Illustrated

**L** : As Illustrated



## Specifications : VFK2000

| Model No. | | VFK2000-080 | VFK2000-090 | VFK2000-100 |
|---|---|---|---|---|
| Workpiece Hole Diameter mm | Straight Hole | φ7.6 ~ φ8.5 | φ8.5 ~ φ9.5 | φ9.5 ~ φ10.8 |
| | Taper Hole | φ8 ~ φ8.5 | φ9 ~ φ9.5 | φ10 ~ φ10.8 |
| Locating Repeatability ※1 mm | | 0.01 | | |
| Allowable Offset (C : Cut) mm | | ±0.4 | ±0.4 | ±0.5 |
| Expanding Force (F) ※2 N | at 1.5MPa | 90 | | |
| | at 5.0MPa | 300 | | |
| | at 7.0MPa | 420 | | |
| Allowable Thrust Load ※3 N | | 450 | 600 | 800 |
| Cylinder Capacity (Empty Action) cm³ | Release side | 0.03 | 0.04 | 0.04 |
| | Lock side | 0.08 | 0.10 | 0.12 |
| Operating Pressure Range MPa | | 1.5 ~ 7.0 | | |
| Withstanding Pressure MPa | | 10.5 | | |
| Recommended Air Blow Pressure MPa | | 0.3 ~ 0.4 | | |
| Operating Temperature Range ℃ | | 0 ~ 70 | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |

## Specifications : VFK3000

| Model No. | | VFK3000-110 | VFK3000-120 | VFK3000-130 | VFK3000-140 | VFK3000-150 |
|---|---|---|---|---|---|---|
| Workpiece Hole Diameter mm | Straight Hole | φ10.4 ~ φ12 | φ11.4 ~ φ13 | φ12.2 ~ φ14.1 | φ13.2 ~ φ15.1 | φ14 ~ φ16.2 |
| | Taper Hole | φ11 ~ φ12 | φ12 ~ φ13 | φ13 ~ φ14.1 | φ14 ~ φ15.1 | φ15 ~ φ16.2 |
| Locating Repeatability ※1 mm | | 0.01 | | | | |
| Allowable Offset (C : Cut) mm | | ±0.6 | ±0.6 | ±0.7 | ±0.7 | ±0.8 |
| Expanding Force (F) ※2 N | at 1.5MPa | 200 | | | | |
| | at 5.0MPa | 650 | | | | |
| | at 7.0MPa | 910 | | | | |
| Allowable Thrust Load ※3 N | | 1000 | 1000 | 1300 | 1300 | 1800 |
| Cylinder Capacity (Empty Action) cm³ | Release side | 0.11 | 0.11 | 0.13 | 0.13 | 0.15 |
| | Lock side | 0.29 | 0.29 | 0.32 | 0.32 | 0.36 |
| Operating Pressure Range MPa | | 1.5 ~ 7.0 | | | | |
| Withstanding Pressure MPa | | 10.5 | | | | |
| Recommended Air Blow Pressure MPa | | 0.3 ~ 0.4 | | | | |
| Operating Temperature Range ℃ | | 0 ~ 70 | | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | |

Notes :

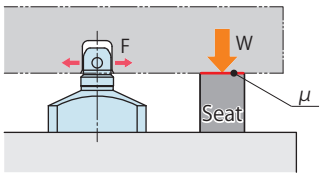
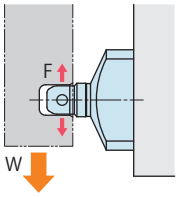
※1. It shows locating repeatability under the specific condition (no load).

※2. Expanding force shows the calculated value when coefficient friction is μ0.1.
Refer to the next page for the relative equation of expanding force and allowable workpiece weight for locating.

※3. Exceeding allowable thrust load leads to accuracy failure and/or damages on the product.

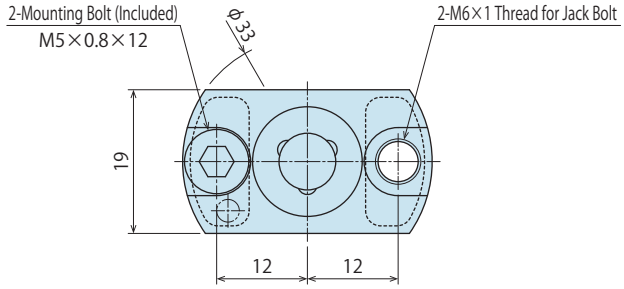
1. This product locates and releases with hydraulic pressure. (Hydraulic Pressure Double Acting Model)
2. This cylinder is used only for locating and does not have a clamping function.

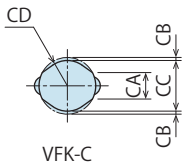
## Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

| Horizontal Attitude | Vertical Attitude |
|---|---|
|  |  |
| Workpiece Weight (W) ≦ $\frac{\text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency 0.5}}{\text{Friction Coefficient of Workpiece Seat Face } (\mu)}$ | Workpiece Weight (W) ≦ Expanding Force per Expansion Locating Pin (F) × Efficiency 0.5 |

## External Dimensions

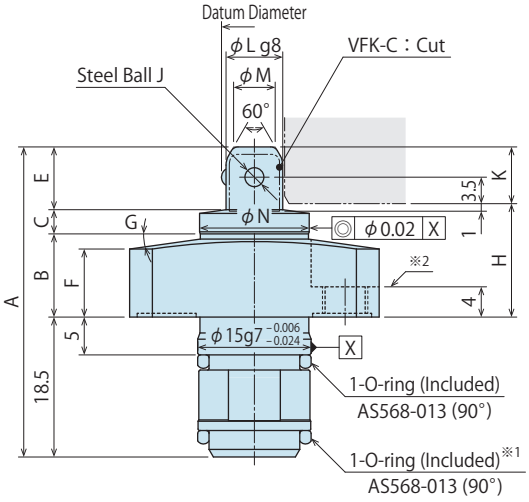
※This drawing shows VFK2000 clamping action without workpiece.



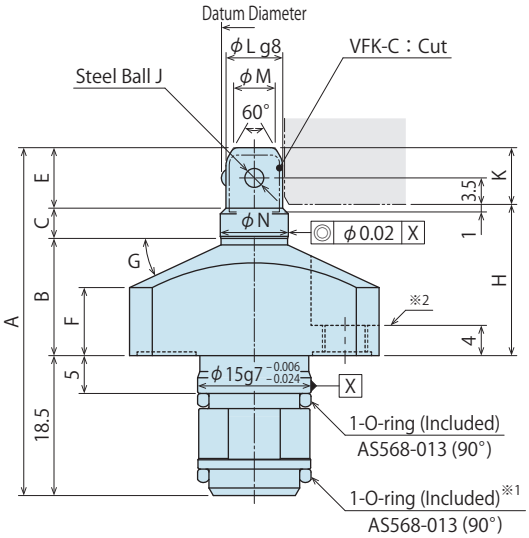




VFK-C
(Cut : One Direction Locating)

5 Seating Height : **H15**

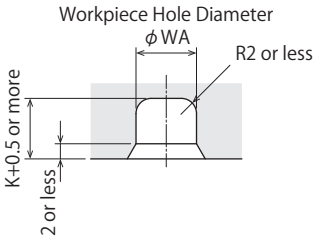



5 Seating Height : **H20 / H25**

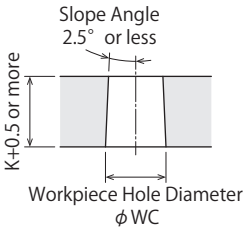


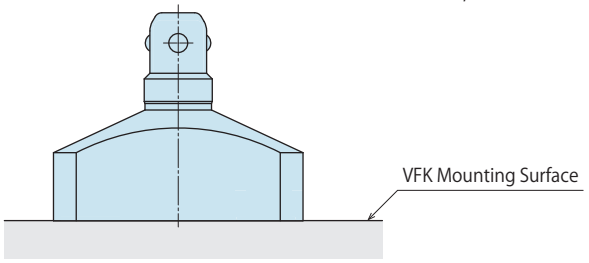

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



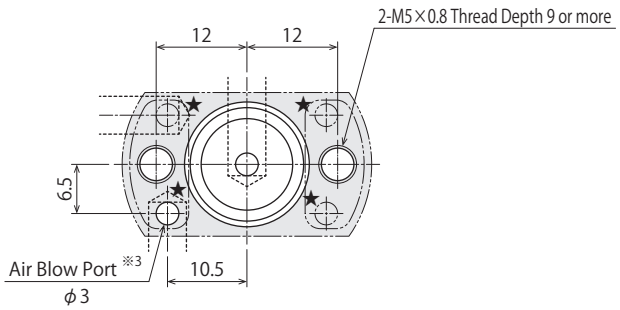

Notes :

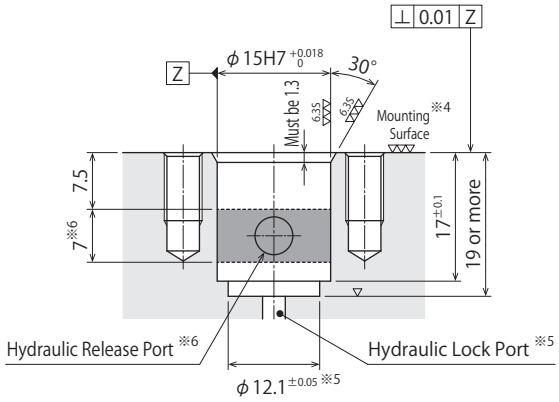
※1. Set the O-ring to the mounting hole side (fixture side) before mounting the body.

※2. Do not use spring washer or toothed lock washer.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly. Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

## Machining Dimensions for Mounting




Notes：

※3. Install the air blow port choosing one port from four ★ parts.

※4. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※5. Prepare the hydraulic lock port on the bottom within the range of ϕ12.1.

※6. Prepare the hydraulic release port within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

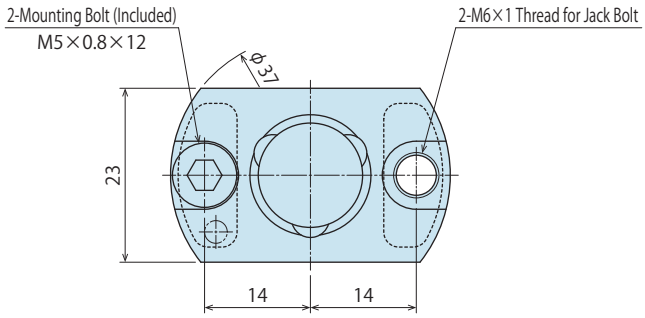
## External Dimensions and Machining Dimensions for Mounting

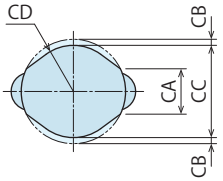
(mm)

| Model No. | | VFK2000-080-□-□ | | | VFK2000-090-□-□ | | | VFK2000-100-□-□ | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 Workpiece Hole Diam. Code | 080 | | | 090 | | | 100 | | |
| | 5 Seating Height | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 7.6～8.5 | | | 8.5～9.5 | | | 9.5～10.8 | | |
| | WC (Taper Hole) | 8～8.5 | | | 9～9.5 | | | 10～10.8 | | |
| Datum Diameter | At Releasing | ϕ7.5 or less | | | ϕ8.3 or less | | | ϕ9.3 or less | | |
| | At Full Stroke | ϕ8.5 or more | | | ϕ9.5 or more | | | ϕ10.8 or more | | |
| Cylinder Stroke | | 1.8 | | | 2.2 | | | 2.6 | | |
| A | | 41 | 46 | 51 | 41.5 | 46.5 | 51.5 | 42 | 47 | 52 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 |
| E | | 8.3 | 8 | 8 | 8.8 | 8.5 | 8.5 | 9.3 | 9 | 9 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 2.5 | | | 3 | | | 3.5 | | |
| K | | 7.5 | | | 8 | | | 8.5 | | |
| L | | 7.5 $^{-0.005}_{-0.027}$ | | | 8.3 $^{-0.005}_{-0.027}$ | | | 9.3 $^{-0.005}_{-0.027}$ | | |
| M | | 5.5 | | | 6 | | | 6.5 | | |
| N | | 14.5 | 9 | 9 | 14.5 | 10 | 10 | 14.5 | 11 | 11 |
| CA | | 3.5 | | | 4 | | | 4.5 | | |
| CB | | 0.4 | | | 0.4 | | | 0.5 | | |
| CC | | 6.7 | | | 7.5 | | | 8.3 | | |
| CD | | R3.35 | | | R3.75 | | | R4.15 | | |
| Weight | g | 70 | 80 | 90 | 70 | 80 | 90 | 70 | 80 | 100 |

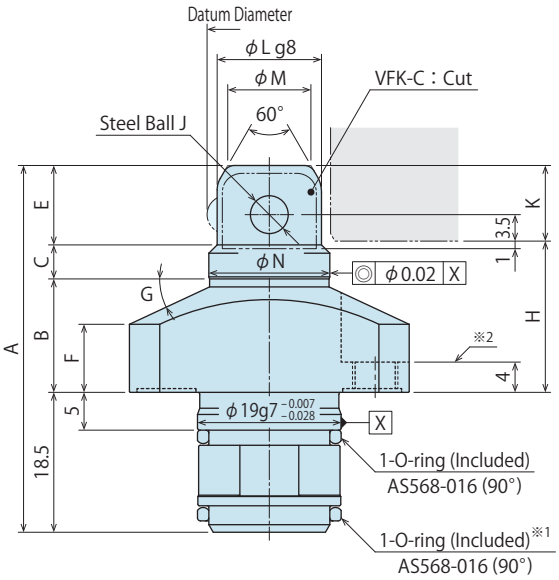
## External Dimensions

※This drawing shows VFK3000 clamping action without workpiece.



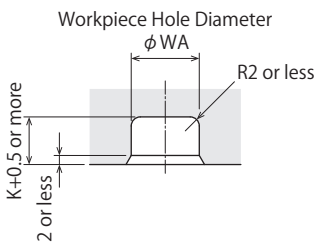




VFK-C
(Cut : One Direction Locating)

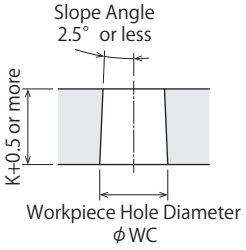


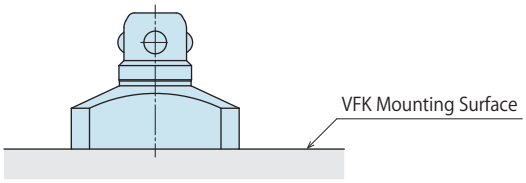

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



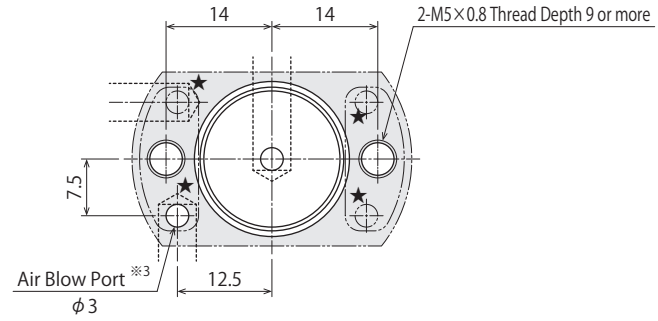

Notes :

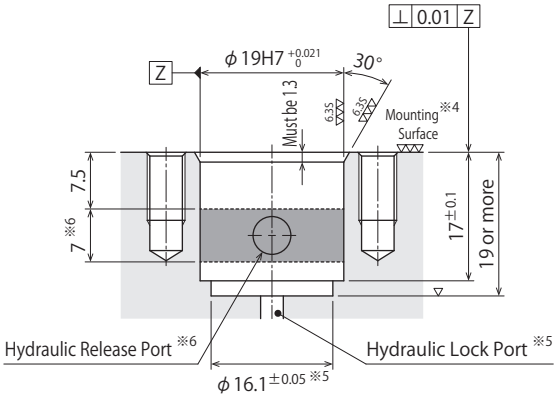
※1. Set the O-ring to the mounting hole side (fixture side) before mounting the body.

※2. Do not use spring washer or toothed lock washer.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly. Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

## Machining Dimensions for Mounting




Notes：

※3. Install the air blow port choosing one port from four ★ parts.

※4. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※5. Prepare the hydraulic lock port on the bottom within the range of ϕ16.1.

※6. Prepare the hydraulic release port within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

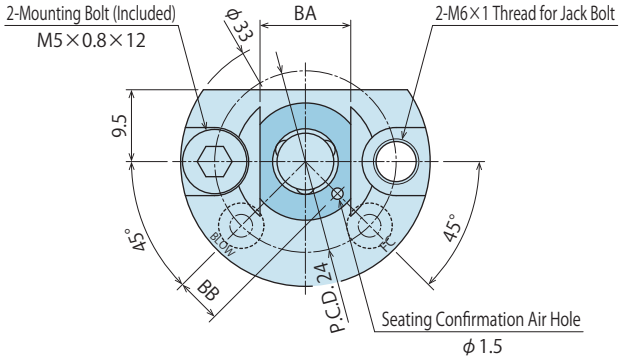
## External Dimensions and Machining Dimensions for Mounting

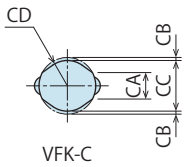
(mm)

| Model No. | | VFK3000-110-□-□ | | | VFK3000-120-□-□ | | | VFK3000-130-□-□ | | | VFK3000-140-□-□ | | | VFK3000-150-□-□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 Workpiece Hole Diam. Code | 110 | | | 120 | | | 130 | | | 140 | | | 150 | | |
| | 5 Seating Height | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 10.4～12 | | | 11.4～13 | | | 12.2～14.1 | | | 13.2～15.1 | | | 14～16.2 | | |
| | WC (Taper Hole) | 11～12 | | | 12～13 | | | 13～14.1 | | | 14～15.1 | | | 15～16.2 | | |
| Datum Diameter | At Releasing | ϕ10.2 or less | | | ϕ11.2 or less | | | ϕ12.0 or less | | | ϕ13.0 or less | | | ϕ13.8 or less | | |
| | At Full Stroke | ϕ12.0 or more | | | ϕ13.0 or more | | | ϕ14.1 or more | | | ϕ15.1 or more | | | ϕ16.2 or more | | |
| Cylinder Stroke | | 3 | | | 3 | | | 3.4 | | | 3.4 | | | 3.8 | | |
| A | | 42.5 | 47.5 | 52.5 | 42.5 | 47.5 | 52.5 | 43 | 48 | 53 | 43 | 48 | 53 | 43.5 | 48.5 | 53.5 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15 | 20 | 11 | 15 | 20 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4.5 | 4.5 | 3.2 | 4.5 | 4.5 |
| E | | 9.8 | 9.5 | 9.5 | 9.8 | 9.5 | 9.5 | 10.3 | 10 | 10 | 10.3 | 10 | 10 | 10.8 | 10.5 | 10.5 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 4 | | | 4 | | | 4.5 | | | 4.5 | | | 5 | | |
| K | | 9 | | | 9 | | | 9.5 | | | 9.5 | | | 10 | | |
| L | | 10.2 $^{-0.006}_{-0.033}$ | | | 11.2 $^{-0.006}_{-0.033}$ | | | 12.0 $^{-0.006}_{-0.033}$ | | | 13.0 $^{-0.006}_{-0.033}$ | | | 13.8 $^{-0.006}_{-0.033}$ | | |
| M | | 7.4 | | | 8.4 | | | 9.2 | | | 10.2 | | | 11.0 | | |
| N | | 18.5 | 12 | 12 | 18.5 | 13 | 13 | 18.5 | 14 | 14 | 18.5 | 15 | 15 | 18.5 | 16 | 16 |
| CA | | 5 | | | 5 | | | 5.5 | | | 5.5 | | | 6 | | |
| CB | | 0.6 | | | 0.6 | | | 0.7 | | | 0.7 | | | 0.8 | | |
| CC | | 9 | | | 10 | | | 10.6 | | | 11.6 | | | 12.2 | | |
| CD | | R4.5 | | | R5 | | | R5.3 | | | R5.8 | | | R6.1 | | |
| Weight | g | 100 | 120 | 130 | 100 | 120 | 130 | 100 | 120 | 140 | 110 | 120 | 140 | 110 | 120 | 140 |

## External Dimensions

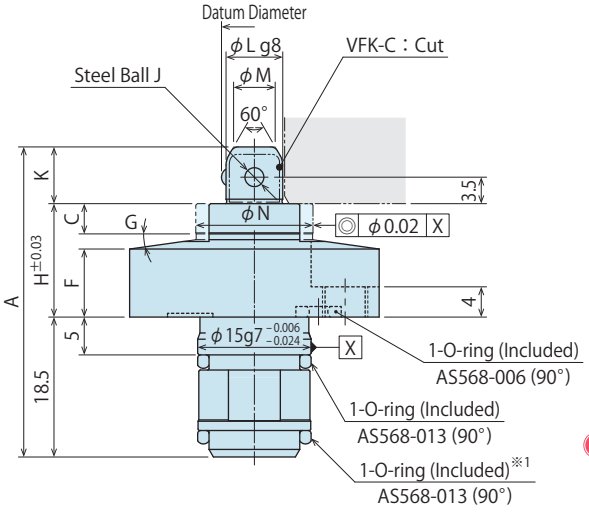
※ This drawing shows VFK2000-BR clamping action without workpiece.
The ports of VFK2000-BL are placed to the symmetrical positions of this drawing.



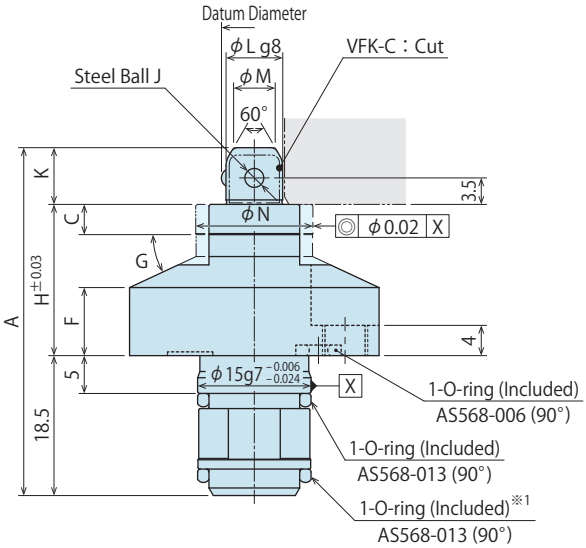




VFK-C
(Cut：One Direction Locating)

5 Seating Height：**H15**

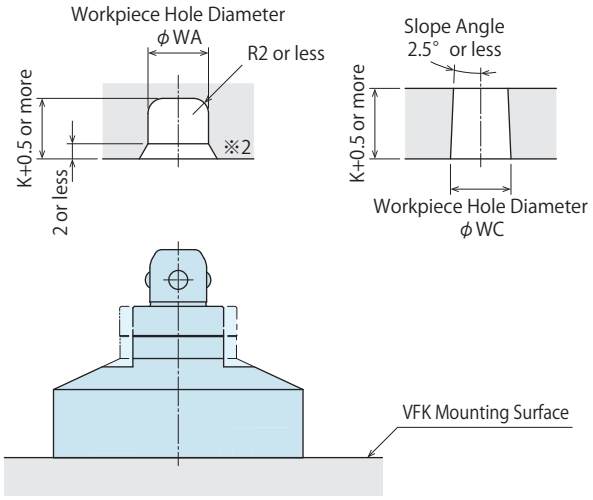



5 Seating Height：**H20 / H25**




## Workpiece Hole Dimensions

Straight Hole | Taper Hole



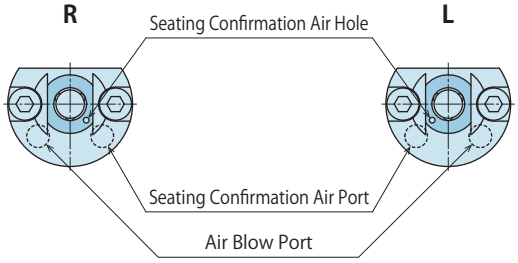

Notes：

※1. Set the O-ring to the mounting hole side (fixture side) before mounting the body.

※2. Please note that if the chamfer of the workpiece hole end is large, the seating confirmation air may not be increased.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (BLOW：Air Blow Port, FC：Seating Confirmation Air Port)
   Continuously supply air pressure to the air blow port and seating confirmation air port.

## Port Position

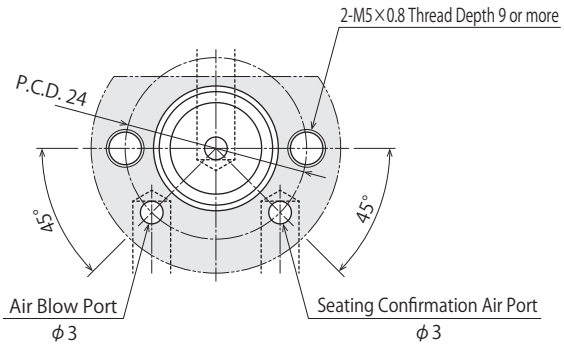



Note：

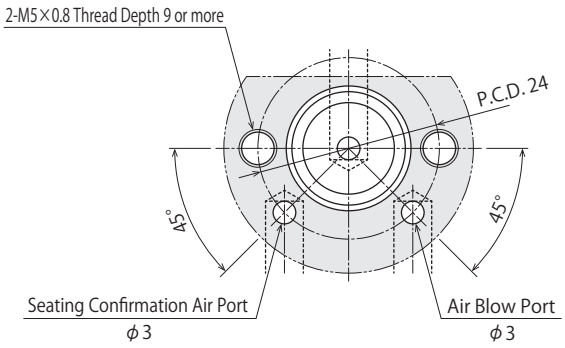
3. Please make sure that the port positions are correct.

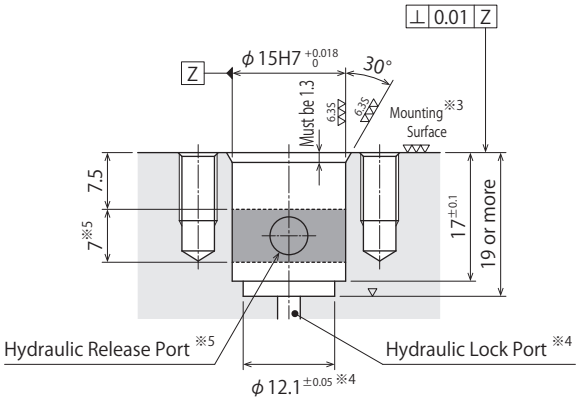
## Machining Dimensions for Mounting

7 Port Position : R




7 Port Position : L




Notes :

※3. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※4. Prepare the hydraulic lock port on the bottom within the range of ϕ12.1.

※5. Prepare the hydraulic release port within ▭ .

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

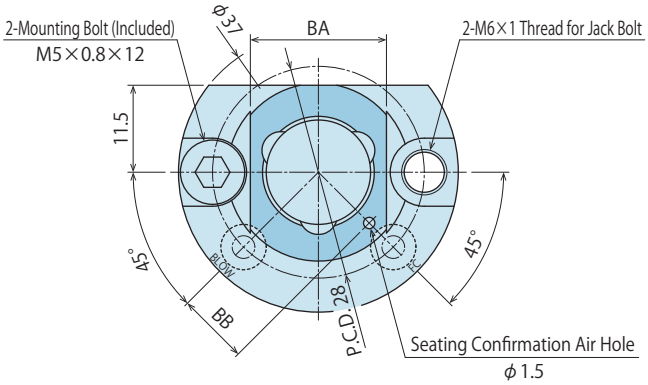
## External Dimensions and Machining Dimensions for Mounting

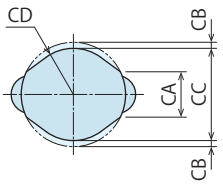
(mm)

| Model No. | | VFK2000-080-□-□-B□ | | | VFK2000-090-□-□-B□ | | | VFK2000-100-□-□-B□ | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 Workpiece Hole Diam. Code | | 080 | | | 090 | | | 100 | | |
| 5 Seating Height | | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 7.6 ~ 8.5 | | | 8.5 ~ 9.5 | | | 9.5 ~ 10.8 | | |
| | WC (Taper Hole) | 8 ~ 8.5 | | | 9 ~ 9.5 | | | 10 ~ 10.8 | | |
| Datum Diameter | At Releasing | ϕ7.5 or less | | | ϕ8.3 or less | | | ϕ9.3 or less | | |
| | At Full Stroke | ϕ8.5 or more | | | ϕ9.5 or more | | | ϕ10.8 or more | | |
| Cylinder Stroke | | 1.8 | | | 2.2 | | | 2.6 | | |
| A | | 41 | 46 | 51 | 41.5 | 46.5 | 51.5 | 42 | 47 | 52 |
| C | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 2.5 | | | 3 | | | 3.5 | | |
| K | | 7.5 | | | 8 | | | 8.5 | | |
| L | | 7.5 $^{-0.005}_{-0.027}$ | | | 8.3 $^{-0.005}_{-0.027}$ | | | 9.3 $^{-0.005}_{-0.027}$ | | |
| M | | 5.5 | | | 6 | | | 6.5 | | |
| N | | 15.5 | 15.5 | 15.5 | 16.5 | 16.5 | 16.5 | 17.5 | 17.5 | 17.5 |
| BA | | 12 | | | 13 | | | 14 | | |
| BB | | 6 | | | 6.5 | | | 7 | | |
| CA | | 3.5 | | | 4 | | | 4.5 | | |
| CB | | 0.4 | | | 0.4 | | | 0.5 | | |
| CC | | 6.7 | | | 7.5 | | | 8.3 | | |
| CD | | R3.35 | | | R3.75 | | | R4.15 | | |
| Weight | g | 80 | 90 | 110 | 80 | 90 | 110 | 80 | 90 | 110 |

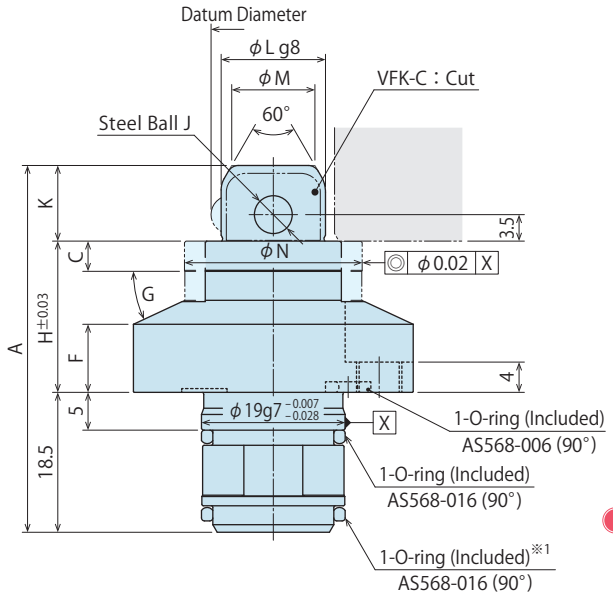
## External Dimensions

※This drawing shows VFK3000-BR clamping action without workpiece.
The ports of VFK3000-BL are placed to the symmetrical positions of this drawing.



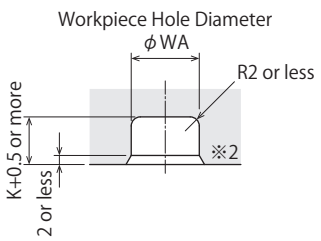




VFK-C
（Cut：One Direction Locating）

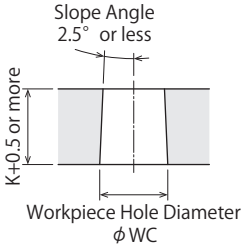


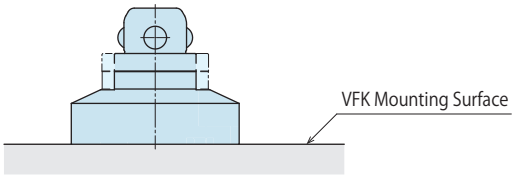

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



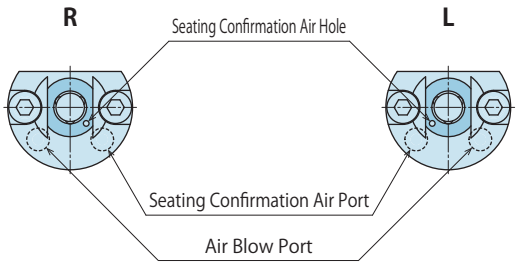

Notes：

※1. Set the O-ring to the mounting hole side (fixture side) before mounting the body.

※2. Please note that if the chamfer of the workpiece hole end is large, the seating confirmation air may not be increased.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (BLOW：Air Blow Port, FC：Seating Confirmation Air Port)
   Continuously supply air pressure to the air blow port and seating confirmation air port.

## Port Position

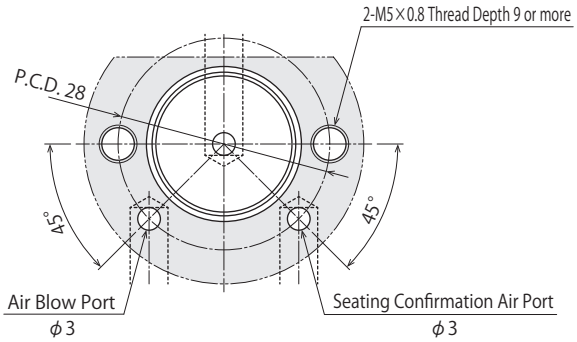



Note：

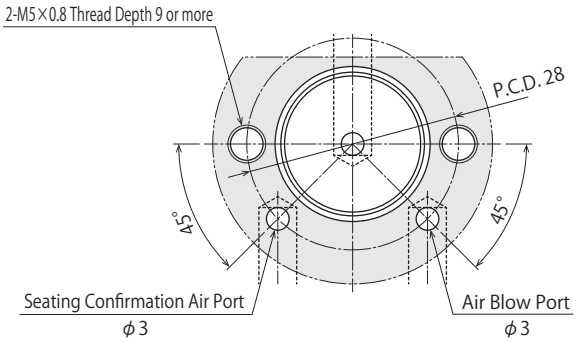
3. Please make sure that the port positions are correct.

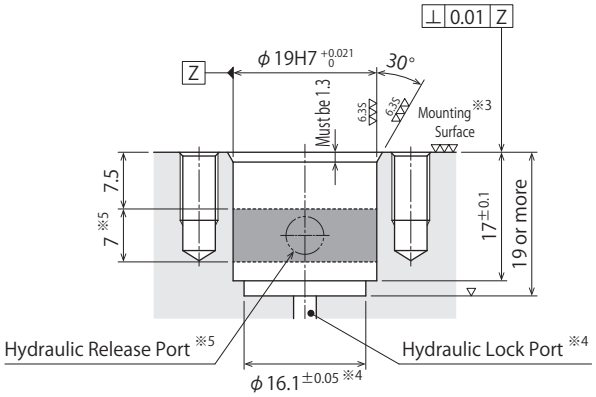
## Machining Dimensions for Mounting

7 Port Position : R




7 Port Position : L




Notes :

※3. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※4. Prepare the hydraulic lock port on the bottom within the range of ϕ16.1.

※5. Prepare the hydraulic release port within ▭ .

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

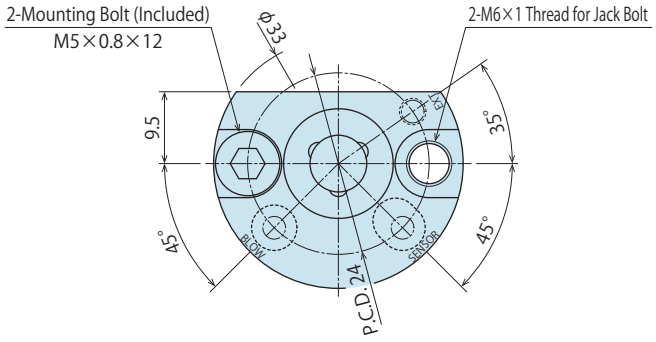
## External Dimensions and Machining Dimensions for Mounting

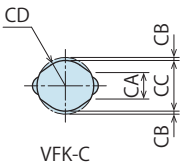
(mm)

| Model No. | | VFK3000-110-□-□-B□ | | | VFK3000-120-□-□-B□ | | | VFK3000-130-□-□-B□ | | | VFK3000-140-□-□-B□ | | | VFK3000-150-□-□-B□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 Workpiece Hole Diam. Code | | 110 | | | 120 | | | 130 | | | 140 | | | 150 | | |
| 5 Seating Height | | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 10.4 ~ 12 | | | 11.4 ~ 13 | | | 12.2 ~ 14.1 | | | 13.2 ~ 15.1 | | | 14 ~ 16.2 | | |
| | WC (Taper Hole) | 11 ~ 12 | | | 12 ~ 13 | | | 13 ~ 14.1 | | | 14 ~ 15.1 | | | 15 ~ 16.2 | | |
| Datum Diameter | At Releasing | ϕ10.2 or less | | | ϕ11.2 or less | | | ϕ12.0 or less | | | ϕ13.0 or less | | | ϕ13.8 or less | | |
| | At Full Stroke | ϕ12.0 or more | | | ϕ13.0 or more | | | ϕ14.1 or more | | | ϕ15.1 or more | | | ϕ16.2 or more | | |
| Cylinder Stroke | | 3 | | | 3 | | | 3.4 | | | 3.4 | | | 3.8 | | |
| A | | 42.5 | 47.5 | 52.5 | 42.5 | 47.5 | 52.5 | 43 | 48 | 53 | 43 | 48 | 53 | 43.5 | 48.5 | 53.5 |
| C | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 4 | | | 4 | | | 4.5 | | | 4.5 | | | 5 | | |
| K | | 9 | | | 9 | | | 9.5 | | | 9.5 | | | 10 | | |
| L | | 10.2 -0.006 -0.033 | | | 11.2 -0.006 -0.033 | | | 12.0 -0.006 -0.033 | | | 13.0 -0.006 -0.033 | | | 13.8 -0.006 -0.033 | | |
| M | | 7.4 | | | 8.4 | | | 9.2 | | | 10.2 | | | 11.0 | | |
| N | | 19.5 | 19.5 | 19.5 | 20.5 | 20.5 | 20.5 | 21.5 | 21.5 | 21.5 | 22.5 | 22.5 | 22.5 | 23.5 | 23.5 | 23.5 |
| BA | | 15 | | | 16 | | | 17 | | | 17 | | | 18 | | |
| BB | | 8 | | | 8.5 | | | 9 | | | 9.5 | | | 10 | | |
| CA | | 5 | | | 5 | | | 5.5 | | | 5.5 | | | 6 | | |
| CB | | 0.6 | | | 0.6 | | | 0.7 | | | 0.7 | | | 0.8 | | |
| CC | | 9 | | | 10 | | | 10.6 | | | 11.6 | | | 12.2 | | |
| CD | | R4.5 | | | R5 | | | R5.3 | | | R5.8 | | | R6.1 | | |
| Weight | g | 110 | 130 | 150 | 110 | 130 | 150 | 110 | 130 | 150 | 110 | 130 | 150 | 120 | 130 | 150 |

## External Dimensions

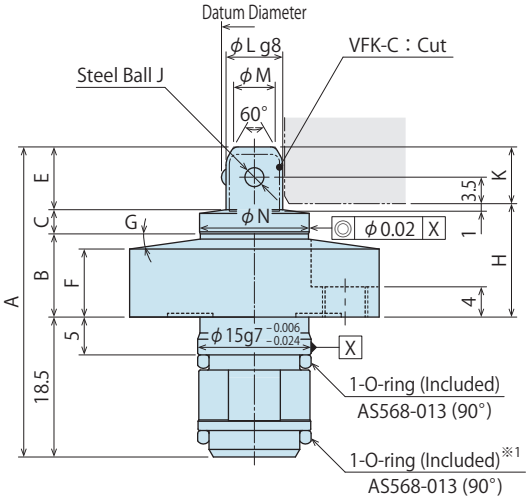
※ This drawing shows VFK2000-MR clamping action without workpiece.
The ports of VFK2000-ML are placed to the symmetrical positions of this drawing.



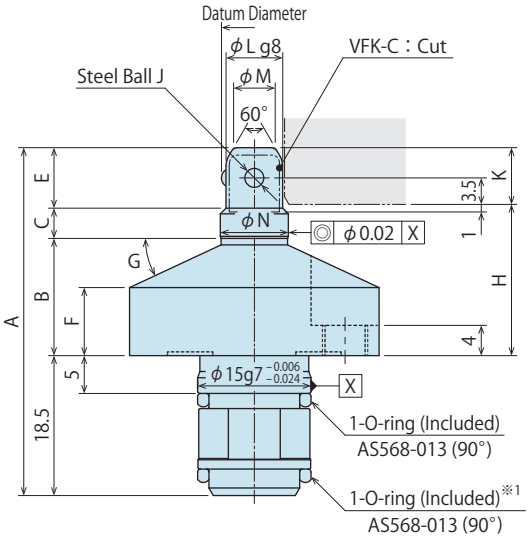




VFK-C
(Cut : One Direction Locating)

5 Seating Height : **H15**

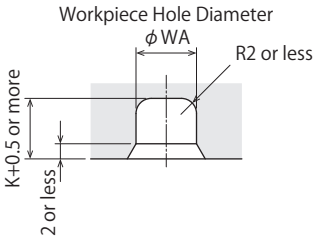



5 Seating Height : **H20 / H25**

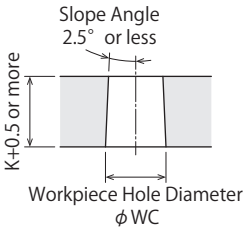


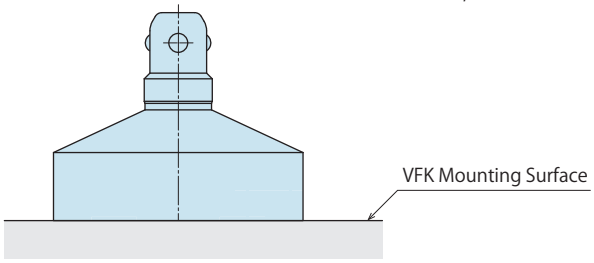

## Workpiece Hole Dimensions

Straight Hole




Taper Hole



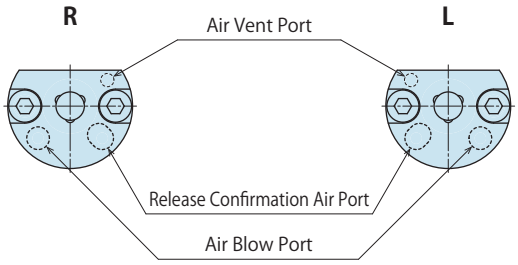




Notes :

※1. Set the O-ring to the mounting hole side (fixture side) before mounting the body.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (EXT : Air Vent Port, BLOW : Air Blow Port,
   SENSOR : Release Confirmation Air Port)
   Continuously supply air pressure to the air blow port and release confirmation air port.
3. This product has no seat. Choose option **-B** : with Seating Surface or prepare an additional seat if necessary.

## Port Position

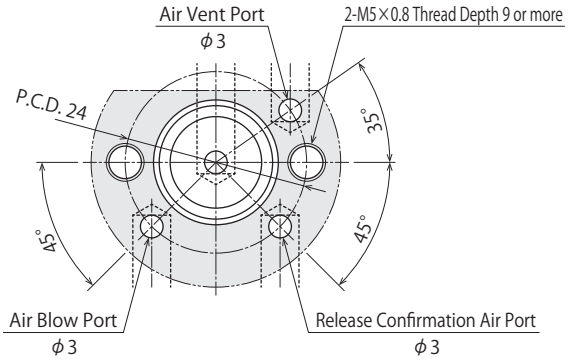



Note :

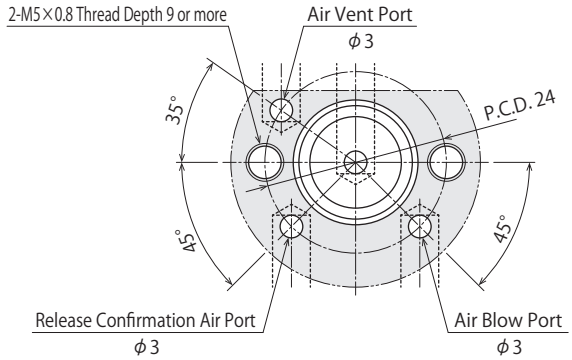
4. Please make sure that the port positions are correct.

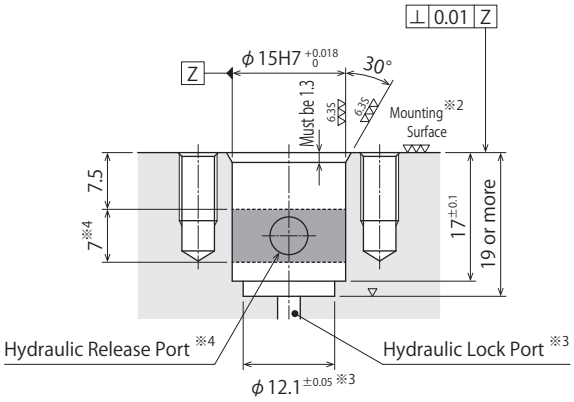
## Machining Dimensions for Mounting

7 Port Position : R




7 Port Position : L




Notes :

※2. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※3. Prepare the hydraulic lock port on the bottom within the range of φ12.1.

※4. Prepare the hydraulic release port within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

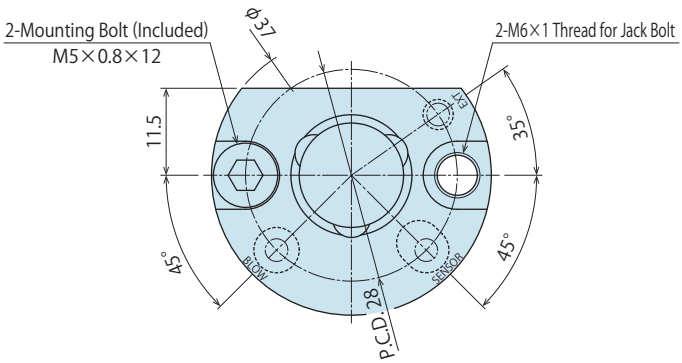
## External Dimensions and Machining Dimensions for Mounting

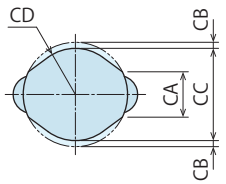
(mm)

| Model No. | | VFK2000-080-□-□-M□ | | | VFK2000-090-□-□-M□ | | | VFK2000-100-□-□-M□ | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 3 Workpiece Hole Diam. Code | | 080 | | | 090 | | | 100 | | |
| 5 Seating Height | | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 7.6 ~ 8.5 | | | 8.5 ~ 9.5 | | | 9.5 ~ 10.8 | | |
| | WC (Taper Hole) | 8 ~ 8.5 | | | 9 ~ 9.5 | | | 10 ~ 10.8 | | |
| Datum Diameter | At Releasing | φ7.5 or less | | | φ8.3 or less | | | φ9.3 or less | | |
| | At Full Stroke | φ8.5 or more | | | φ9.5 or more | | | φ10.8 or more | | |
| Cylinder Stroke | | 1.8 | | | 2.2 | | | 2.6 | | |
| A | | 41 | 46 | 51 | 41.5 | 46.5 | 51.5 | 42 | 47 | 52 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 |
| E | | 8.3 | 8 | 8 | 8.8 | 8.5 | 8.5 | 9.3 | 9 | 9 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 2.5 | | | 3 | | | 3.5 | | |
| K | | 7.5 | | | 8 | | | 8.5 | | |
| L | | 7.5 $^{-0.005}_{-0.027}$ | | | 8.3 $^{-0.005}_{-0.027}$ | | | 9.3 $^{-0.005}_{-0.027}$ | | |
| M | | 5.5 | | | 6 | | | 6.5 | | |
| N | | 14.5 | 9 | 9 | 14.5 | 10 | 10 | 14.5 | 11 | 11 |
| CA | | 3.5 | | | 4 | | | 4.5 | | |
| CB | | 0.4 | | | 0.4 | | | 0.5 | | |
| CC | | 6.7 | | | 7.5 | | | 8.3 | | |
| CD | | R3.35 | | | R3.75 | | | R4.15 | | |
| Weight | g | 80 | 90 | 110 | 80 | 90 | 110 | 80 | 90 | 110 |

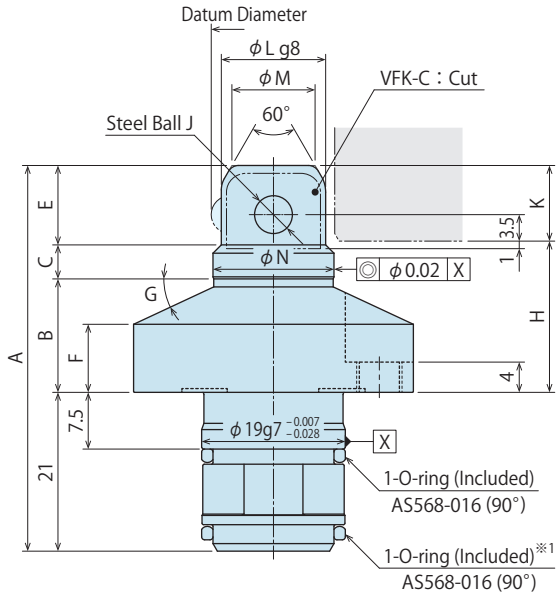
## External Dimensions

※ This drawing shows VFK3000-MR clamping action without workpiece.
The ports of VFK3000-ML are placed to the symmetrical positions of this drawing.

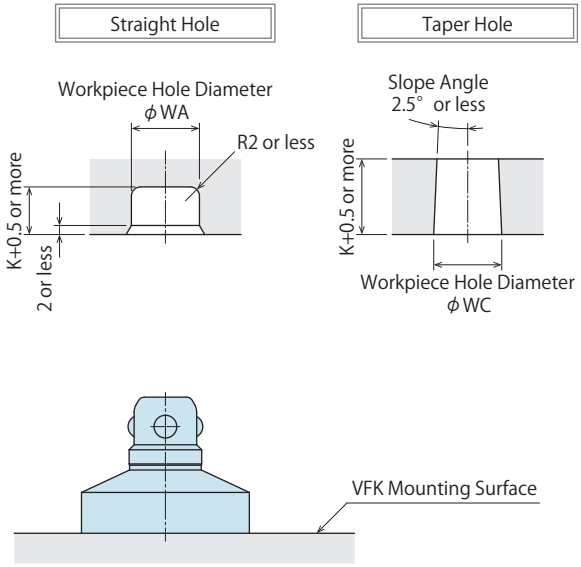



VFK-C
(Cut：One Direction Locating)




## Workpiece Hole Dimensions

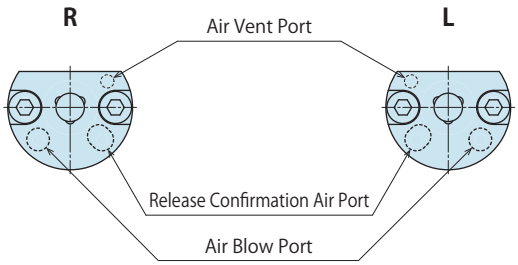



Notes：

※1. Set the O-ring to the mounting hole side (fixture side) before mounting the body.

1. When mounting the product, use two mounting bolts (Strength Grade 12.9) and tighten them evenly.
   Use two jack bolts to remove the product, keeping it parallel to the mounting surface.
2. The port names are marked on the product surface.
   (EXT：Air Vent Port, BLOW：Air Blow Port,
   SENSOR：Release Confirmation Air Port)
   Continuously supply air pressure to the air blow port and release confirmation air port.
3. This product has no seat. Choose option **-B**：with Seating Surface or prepare an additional seat if necessary.

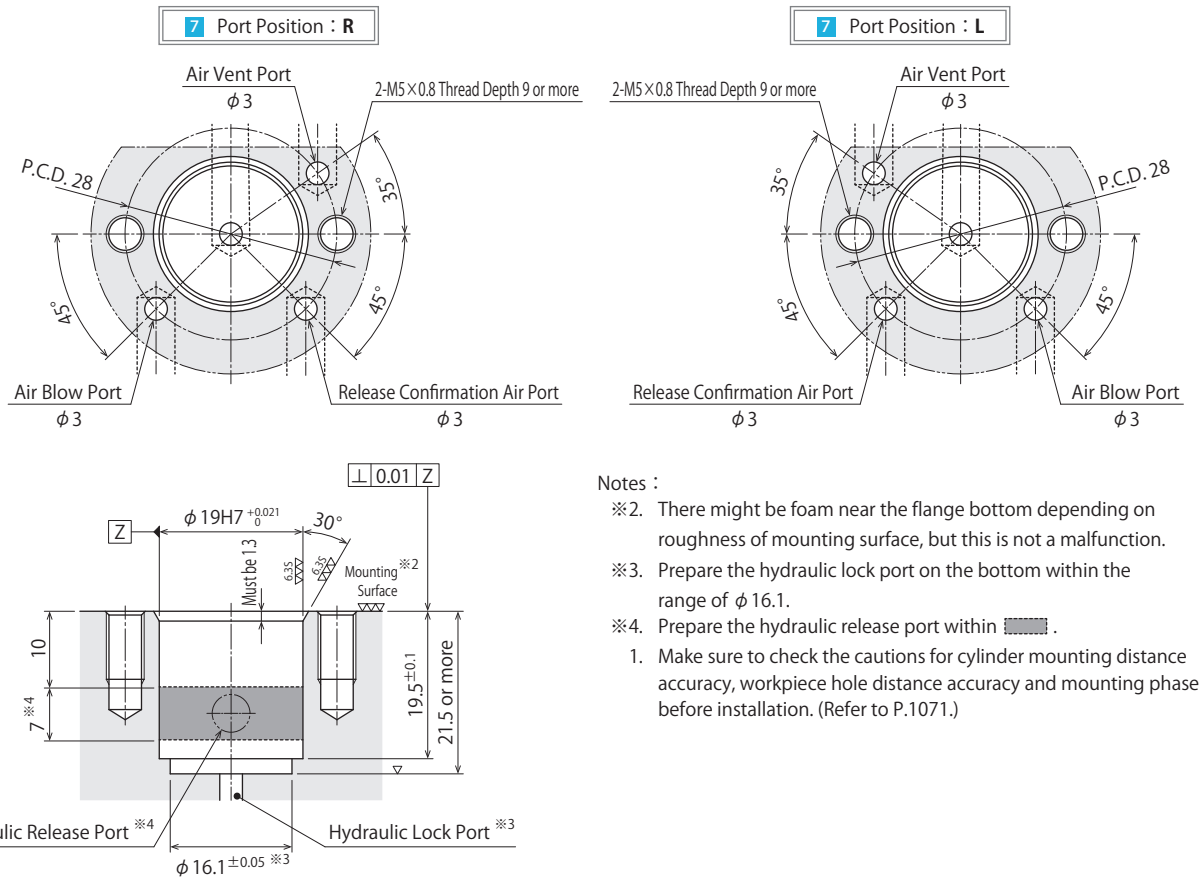
## Port Position




Note：

4. Please make sure that the port positions are correct.

## Machining Dimensions for Mounting




Notes :

※2. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.

※3. Prepare the hydraulic lock port on the bottom within the range of φ16.1.

※4. Prepare the hydraulic release port within ▭.

1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1071.)

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No. | | VFK3000-110-□-□-M□ | | | VFK3000-120-□-□-M□ | | | VFK3000-130-□-□-M□ | | | VFK3000-140-□-□-M□ | | | VFK3000-150-□-□-M□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 Workpiece Hole Diam. Code | | 110 | | | 120 | | | 130 | | | 140 | | | 150 | | |
| 5 Seating Height | | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 | H15 | H20 | H25 |
| Workpiece Hole Diameter | WA (Straight Hole) | 10.4 ~ 12 | | | 11.4 ~ 13 | | | 12.2 ~ 14.1 | | | 13.2 ~ 15.1 | | | 14 ~ 16.2 | | |
| | WC (Taper Hole) | 11 ~ 12 | | | 12 ~ 13 | | | 13 ~ 14.1 | | | 14 ~ 15.1 | | | 15 ~ 16.2 | | |
| Datum Diameter | At Releasing | φ10.2 or less | | | φ11.2 or less | | | φ12.0 or less | | | φ13.0 or less | | | φ13.8 or less | | |
| | At Full Stroke | φ12.0 or more | | | φ13.0 or more | | | φ14.1 or more | | | φ15.1 or more | | | φ16.2 or more | | |
| Cylinder Stroke | | 3 | | | 3 | | | 3.4 | | | 3.4 | | | 3.8 | | |
| A | | 45 | 50 | 55 | 45 | 50 | 55 | 45.5 | 50.5 | 55.5 | 45.5 | 50.5 | 55.5 | 46 | 51 | 56 |
| B | | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15.5 | 20.5 | 11 | 15 | 20 | 11 | 15 | 20 |
| C | | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4 | 4 | 3.2 | 4.5 | 4.5 | 3.2 | 4.5 | 4.5 |
| E | | 9.8 | 9.5 | 9.5 | 9.8 | 9.5 | 9.5 | 10.3 | 10 | 10 | 10.3 | 10 | 10 | 10.8 | 10.5 | 10.5 |
| F | | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 | 9 | 9 | 9.5 |
| G | | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° | 8° | 25° | 40° |
| H | | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 | 15 | 20 | 25 |
| J | | 4 | | | 4 | | | 4.5 | | | 4.5 | | | 5 | | |
| K | | 9 | | | 9 | | | 9.5 | | | 9.5 | | | 10 | | |
| L | | 10.2 $^{-0.006}_{-0.033}$ | | | 11.2 $^{-0.006}_{-0.033}$ | | | 12.0 $^{-0.006}_{-0.033}$ | | | 13.0 $^{-0.006}_{-0.033}$ | | | 13.8 $^{-0.006}_{-0.033}$ | | |
| M | | 7.4 | | | 8.4 | | | 9.2 | | | 10.2 | | | 11.0 | | |
| N | | 18.5 | 12 | 12 | 18.5 | 13 | 13 | 18.5 | 14 | 14 | 18.5 | 15 | 15 | 18.5 | 16 | 16 |
| CA | | 5 | | | 5 | | | 5.5 | | | 5.5 | | | 6 | | |
| CB | | 0.6 | | | 0.6 | | | 0.7 | | | 0.7 | | | 0.8 | | |
| CC | | 9 | | | 10 | | | 10.6 | | | 11.6 | | | 12.2 | | |
| CD | | R4.5 | | | R5 | | | R5.3 | | | R5.8 | | | R6.1 | | |
| Weight | g | 120 | 140 | 160 | 120 | 140 | 160 | 120 | 140 | 160 | 120 | 140 | 160 | 120 | 140 | 160 |

## Cautions

### Notes for Design Regarding VFL / VFM / VFJ / VFK

1) Check Specifications

- Please use each product according to the specifications.
  VFL locates with spring and releases with hydraulic pressure.
  VFM locates and releases with hydraulic pressure.
  VFJ locates with hydraulic pressure and releases with spring.
  VFK locates and releases with hydraulic pressure.

2) Notes for Circuit Design

- Please read "Circuit Reference" for proper hydraulic circuit design. Improper circuit design may lead to malfunctions and damages.

3) Air Supply

- Continuously supply air pressure to the air blow port. If air supply is shut off during operation, contaminants enter into the cylinder leading to malfunctions.
- Continuously supply air pressure to the seating confirmation air port for -**B**：with Seating Surface, and to the release confirmation air port for -**M**：Release Confirmation model.

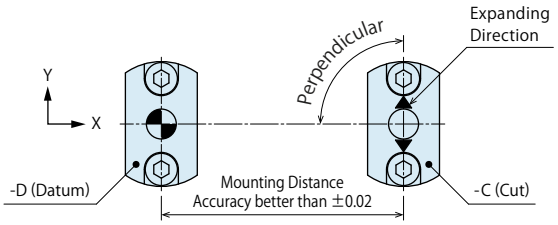
4) Setting Up a Clamp

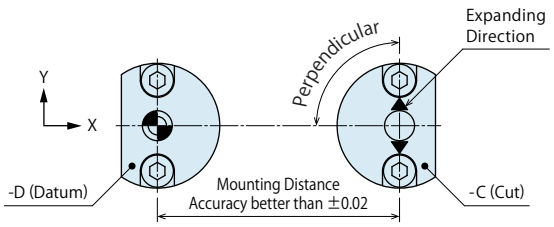
- The expansion locating pin is a positioning cylinder and has no clamping mechanism. A clamp must be provided separately.

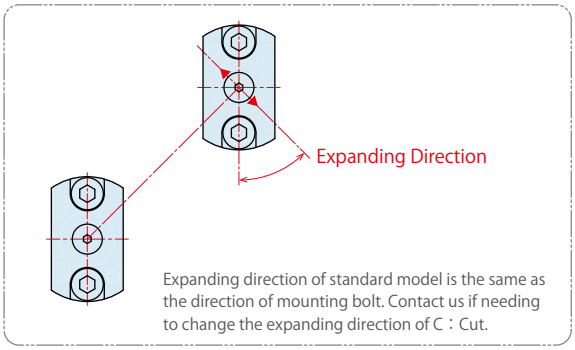
5) Expansion Locating Pin Mounting Direction (Phase)

- The Cut (VF□-C) locates a workpiece in the direction of rotation, based on the datum (VF□-D). VF□-C (Cut : for locating in one direction) locates in one direction (Y-axis), so phasing is necessary.

  When mounting the product, make sure that expanding direction of -C (Cut) is perpendicular to -D (Datum).



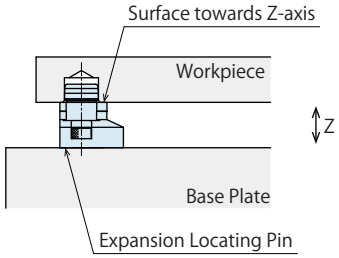



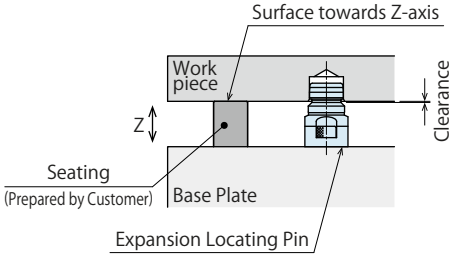

6) Reference Surface towards Z-axis

- -**B**：with Seating Surface has seating on the flange surface, but Standard and -**M**：Release Confirmation models have no seating (reference surface towards Z-axis). Please prepare an additional seat.

-**B**：with Seating Surface

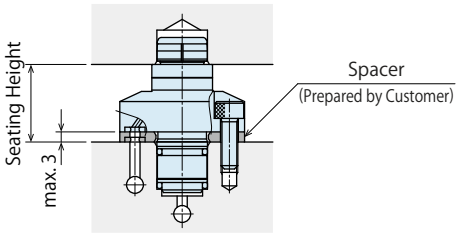



Standard / -**M**：Release Confirmation Model

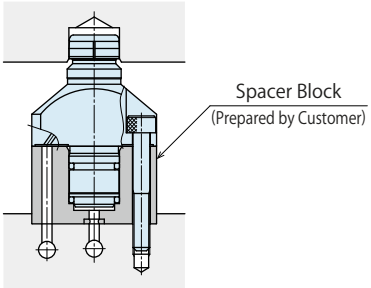



7) Adjusting Height of Expansion Locating Pin

- Seating height can be selected from 15mm / 20mm / 25mm / 30mm.
- For slight adjustment of seating height and expanding part height, install a spacer (3mm or less) under the flange.

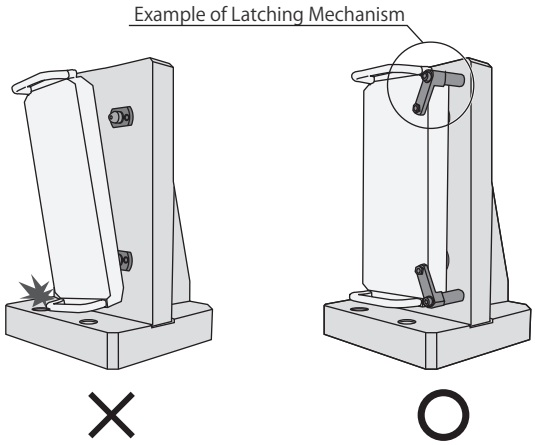



- Install a spacer block under the flange if the height of expansion locating pin is not enough.



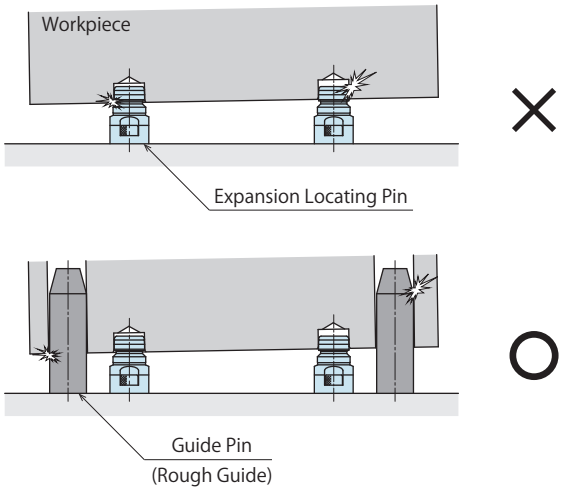
8) When the workpiece is in vertical position.

- When setting a workpiece, make sure it is in proper proximity and square to the expansion locating pins.
  If it is locked out of position, the products may be damaged.
- As the workpiece may fall down during releasing, it is recommended to set up the latching mechanism to prevent it from falling down.
- When the workpiece is used in vertical position (hanging on the wall), the internal moving parts tend to wear out. Check the locating accuracy regularly, and if exceeding the allowable range, replace the product.



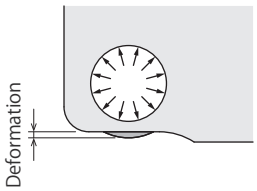

9) Inclination in the Z-axis direction.

- If a workpiece is tilted when loading/unloading, expanded part of expansion locating pin and workpiece hole will get stuck and the cylinder and workpiece will be damaged. Workpiece should be loaded and unloaded with less than 4/100 ~ 5/100 (approx. 2 ~ 3°) of tilt between workpiece and expansion locating pin plane.
- If necessary, provide guide pins to keep the workpiece level during loading and unloading. Please prepare guide pin (rough guide) etc.




10) Thickness around the Workpiece Hole

- Thin wall around the workpiece hole could be deformed by expanding force, and locating accuracy would not fill the specification. Please conduct trial testing and adjust to proper hydraulic pressure before use.



## Cautions

### ● Notes for Design Regarding VFL / VFM

1) Distance Accuracy of VFL / VFM

● Distance accuracy of the VFL / VFM's mounting hole should be better than ±0.02mm.

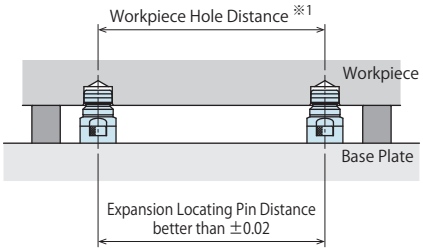
※1. The distance accuracy of each workpiece hole should be within the center distance accuracy on the following list "JIS B 0613 Class 2" considering the allowable offset (VFL / VFM-C：Cut) and the datum cylinder distance accuracy (VFL / VFM-D：Datum).

Allowable Offset (C : Cut) ≧ Datum Cylinder Distance Accuracy
+Workpiece Hole Distance Accuracy
(Listed in JIS B 0613)

The following shows the center distance accuracy [Class 2] (JIS B 0613).

[JIS B 0613 Excerpt] unit : mm

| Center Distance Classification | | Center Distance Accuracy |
|---|---|---|
| Greater than | or less | Class 2 |
| 50 | 80 | ±0.023 |
| 80 | 120 | ±0.027 |
| 120 | 180 | ±0.032 |
| 180 | 250 | ±0.036 |
| 250 | 315 | ±0.041 |
| 315 | 400 | ±0.045 |
| 400 | 500 | ±0.049 |
| 500 | 630 | ±0.055 |
| 630 | 800 | ±0.063 |
| 800 | 1000 | ±0.070 |




### ● Notes for Design Regarding VFJ / VFK

1) Distance Accuracy of VFJ / VFK

● Distance accuracy between VFJ / VFK mounting holes (-D/-C) and between workpiece holes has to be determined according to the allowable offset (VFJ / VFK-C：Cut).

## Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1355).

2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly.
  The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.

3) Applying Sealing Tape

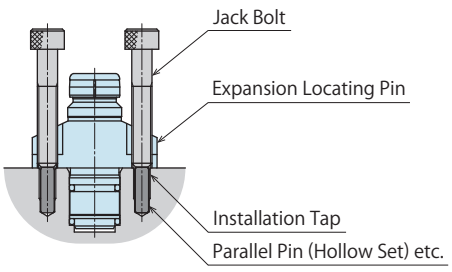
- Wrap with tape 1 to 2 times following the screwing direction.
  Wrapping in the wrong direction will cause leaks and malfunction.
- Pieces of the sealing tape can lead to oil leaks and malfunction.
- When piping, be careful that contaminant such as sealing tape does not enter in products.

4) Installation / Removal of the Expansion Locating Pin

- Use all bolts with hex holes (Strength Grade 12.9) and tighten them with a torque shown in the table below.
  Tighten them evenly to prevent twisting or jamming.

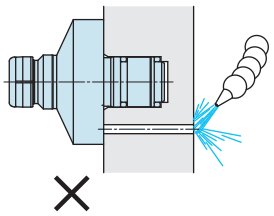
| Model No. | Thread Size | Tightening Torque (N·m) |
|---|---|---|
| **VFL2000** | M5×0.8 | 6.3 |
| **VFL3000** | M5×0.8 | 6.3 |
| **VFL4000** | M6×1 | 10 |
| **VFL5000** | M6×1 | 10 |
| **VFL6000** | M8×1.25 | 25 |
| **VFM2000** | M5×0.8 | 6.3 |
| **VFM3000** | M5×0.8 | 6.3 |
| **VFM4000** | M6×1 | 10 |
| **VFM5000** | M6×1 | 10 |
| **VFM6000** | M8×1.25 | 25 |
| **VFJ2000** | M5×0.8 | 6.3 |
| **VFJ3000** | M5×0.8 | 6.3 |
| **VFK2000** | M5×0.8 | 6.3 |
| **VFK3000** | M5×0.8 | 6.3 |

- Do not use spring washer or toothed lock washer.
- There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.
- When removing the product, use two jack bolts (two mounting bolt holes) in order not to damage the installation tap. The following shows the case in which the parallel pin (hollow set) is set in the tapped hole so that the installation tap will not be damaged.



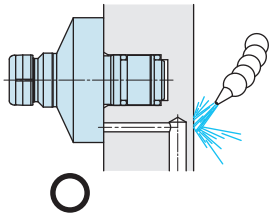

5) Appropriate Measures for the Air Vent Port

- For the air vent port of **–M** : Release Confirmation model, consider the environment and avoid coolant or any contaminants. If coolant or contaminants enter in the product, it will not function properly.

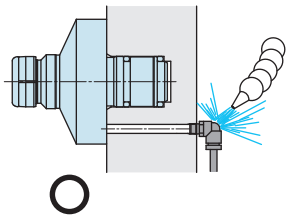


Examples

① Prepare a manifold piping.
Use the manifold piping and prepare the air vent port to the place without the influence of coolant or cutting chips.

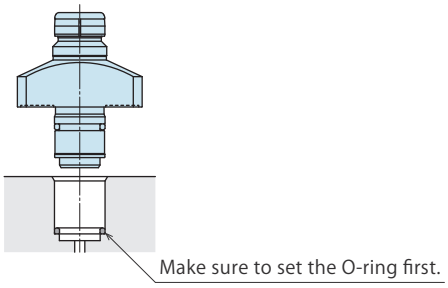


② Prepare an external piping.
If it is impossible to prepare manifold piping like the case ①, move the air vent port by using external piping to the place without the influence of coolant or any contaminants.



6) Installation of O-ring (Included)

- For VFL / VFM (VFM2000 / VFM3000 / VFM4000) / VFK, set the O-ring to the mounting hole side (fixture side) before mounting the body.



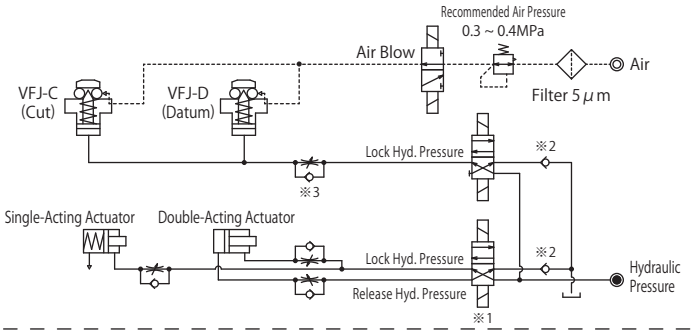
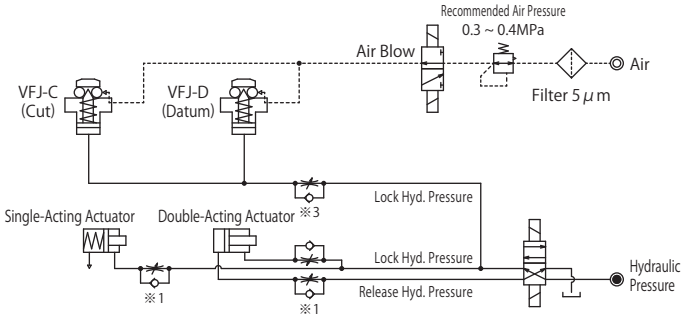
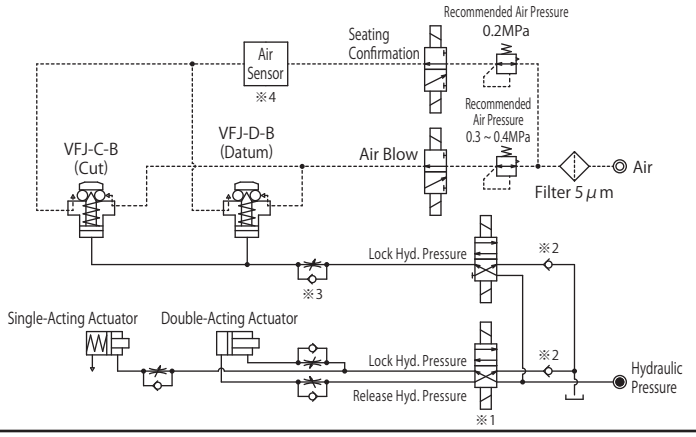
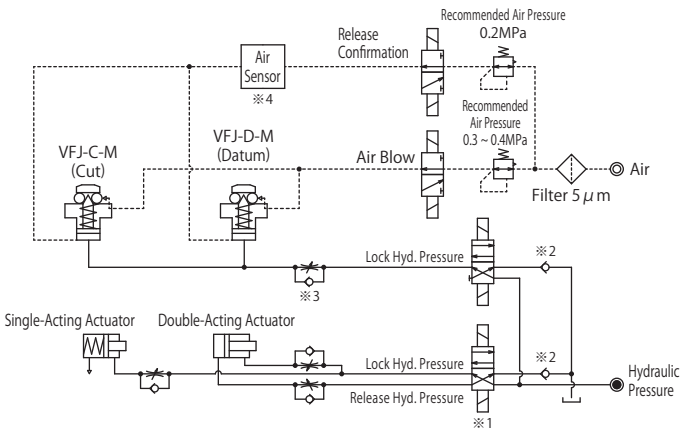

※ Please refer to P.1355 for common cautions. • Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit • Notes on Handling • Maintenance/Inspection • Warranty

## Circuit Reference

● Notes on Hydraulic Cylinder Speed Control Circuit | VFJ (Standard) | VFJ-B (with Seating Surface) | VFJ-M (Release Confirmation)

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

Circuit Reference

| | | |
|---|---|---|
| Single Action<br>model VFJ<br>Standard | Expansion Locating Pin and other actuators on different circuits.<br>**VFJ**<br>Locates with Hydraulic Pressure<br>Releases with Spring |  |
| | Expansion Locating Pin and other actuators on the same circuit.<br>**VFJ**<br>Locates with Hydraulic Pressure<br>Releases with Spring |  |
| Single Action<br>model VFJ-B<br>with Seating Surface | Expansion Locating Pin and other actuators on different circuits.<br>**VFJ-B**<br>Locates with Hydraulic Pressure<br>Releases with Spring |  |
| Single Action<br>model VFJ-M<br>Release Confirmation Model | Expansion Locating Pin and other actuators on different circuits.<br>**VFJ-M**<br>Locates with Hydraulic Pressure<br>Releases with Spring |  |

Notes：

※1. The procedure for lock operation should be "VFJ (Expansion Locating Pin)" → "other actuators". Otherwise there might be accuracy failure and/or damages on the product.

※2. Use the check valve (Recommended cracking pressure：0.04MPa or less) if there is back pressure in the tank port.

※3. Adjust the flow rate so that there is no surge pressure.

※4. Refer to the table on the right for recommended air sensors.

1. This circuit reference is one example. It should be prepared depending on the fixture structure.

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

## Notes on Hydraulic Cylinder Speed Control Circuit

VFK (Standard) | VFK-B (with Seating Surface) | VFK-M (Release Confirmation)

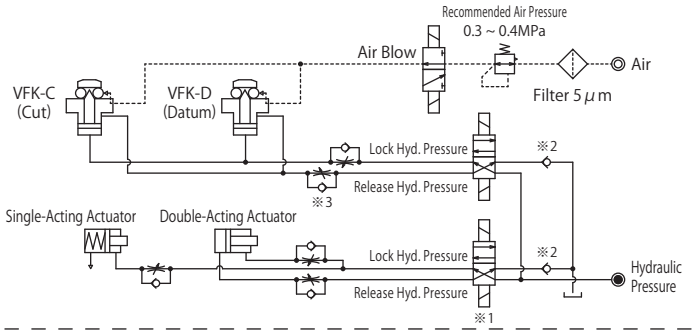
Please pay attention to the cautions below. Design the circuit for controlling the action speed of cylinder.
Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Circuit Reference

### Double Action model VFK Standard

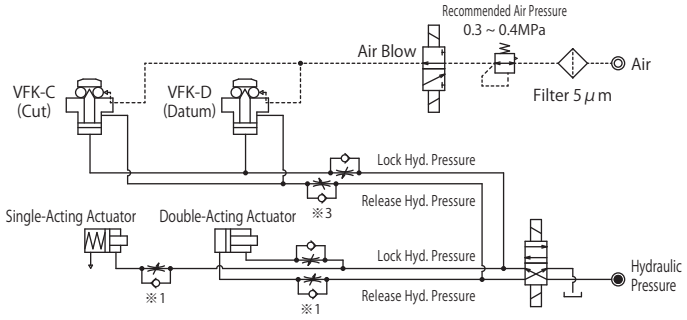
Expansion Locating Pin and other actuators on different circuits.

**VFK**
**Locates and Releases with Hydraulic Pressure**




Expansion Locating Pin and other actuators on the same circuit.

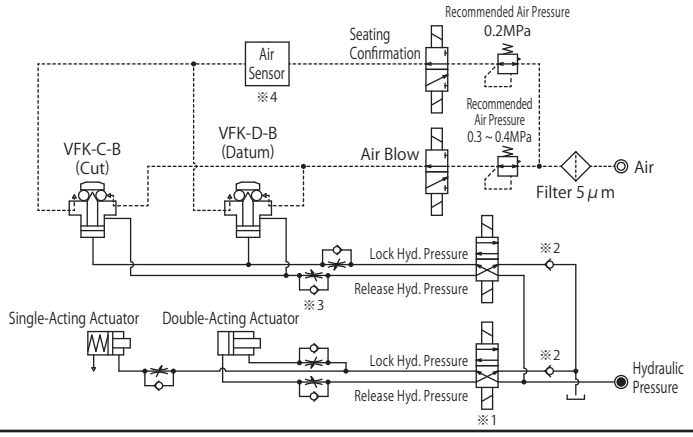
**VFK**
**Locates and Releases with Hydraulic Pressure**




### Double Action model VFK-B with Seating Surface

Expansion Locating Pin and other actuators on different circuits.

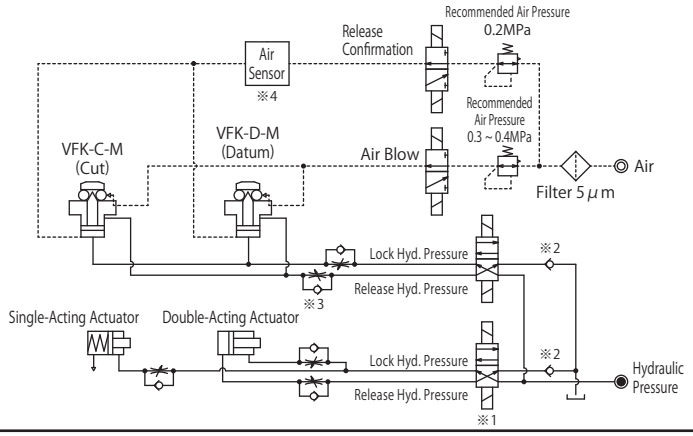
**VFK-B**
**Locates and Releases with Hydraulic Pressure**




### Double Action model VFK-M Release Confirmation Model

Expansion Locating Pin and other actuators on different circuits.

**VFK-M**
**Locates and Releases with Hydraulic Pressure**




Notes：

※1. The procedure for lock operation should be "VFK (Expansion Locating Pin)" → "other actuators". Otherwise there might be accuracy failure and/or damages on the product.
※2. Use the check valve (Recommended cracking pressure：0.04MPa or less) if there is back pressure in the tank port.
※3. Adjust the flow rate so that there is no surge pressure.
※4. Refer to the table on the right for recommended air sensors.
1. This circuit reference is one example. It should be prepared depending on the fixture structure.

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

## Cautions

### Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
- The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with Kosmek's product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.

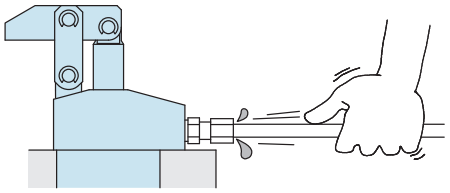
3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- Please implement piping construction in a clear environment to prevent anything getting in products.

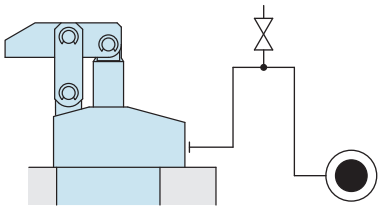
4) Air Bleeding of the Hydraulic Circuit

- If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.

① Reduce hydraulic pressure to less than 2MPa.
② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
③ Shake the pipeline to loosen the outlet of pipe fitting.
Hydraulic fluid mixed with air comes out.



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



5) Checking Looseness and Retightening

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

### Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

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

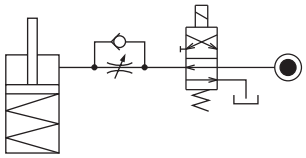
Note : Please contact manufacturers when customers require products in the list above.

## Notes on Hydraulic Cylinder Speed Control Unit

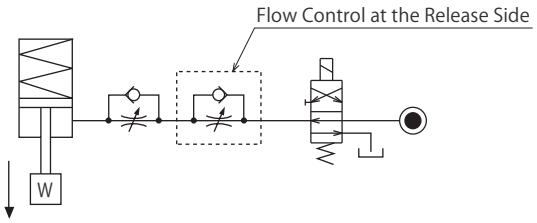
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

### Flow Control Circuit for Single Acting Cylinder

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



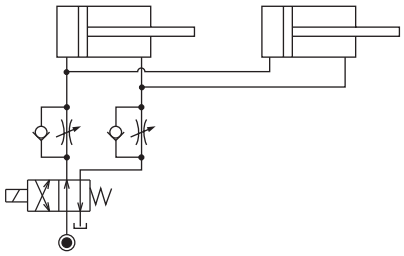
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



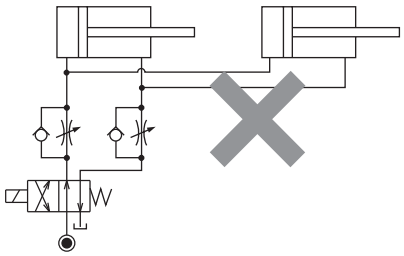

### Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.
However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
Refer to P.75 for speed adjustment of LKE.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

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

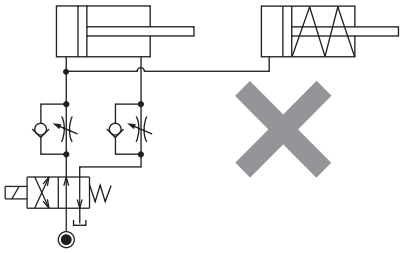


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



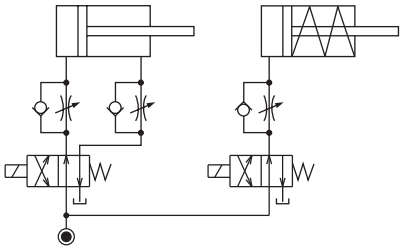
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

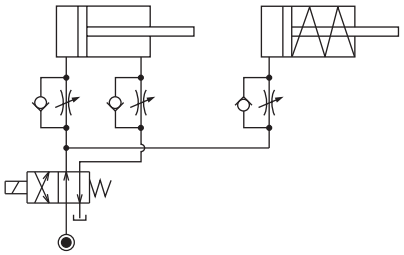


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

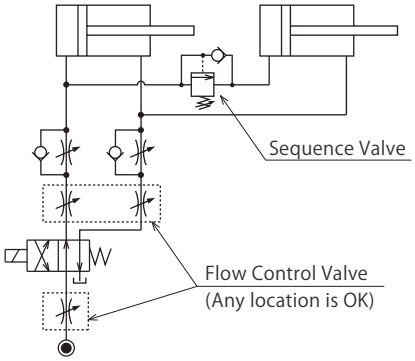
○ Separate the control circuit.



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



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



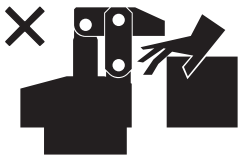
## Cautions

### Notes on Handling

1) It should be 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 abnormality 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 due to clinching.

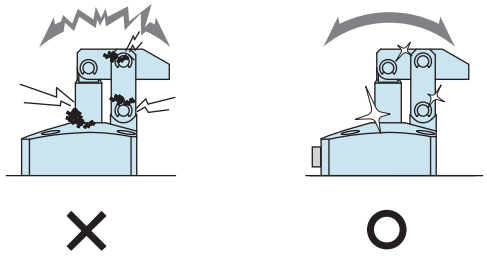


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

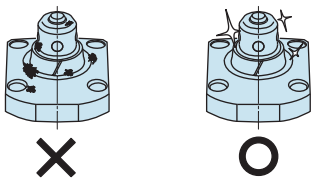
### Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that safety devices and preventive 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 abnormality in the bolts and respective parts before restarting.

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



3) Please clean out the reference surfaces on a regular basis (taper reference surface and seating surface) of the locating products. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXE/VXF)
- The locating products, except VX/VXE/VXF model, can remove contaminants with cleaning functions. However, hardened cutting chips, adhesive coolant and others may not be removed. Make sure there are no contaminants before installing a workpiece/pallet.
- Continuous use with contaminant on components will lead to locating accuracy failure, malfunction and fluid leakage.



4) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.

5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) 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.

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

9) Please contact us for overhaul and repair.

## Warranty

1) Warranty Period

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

2) Warranty Scope

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

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or 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.

# Sales Offices

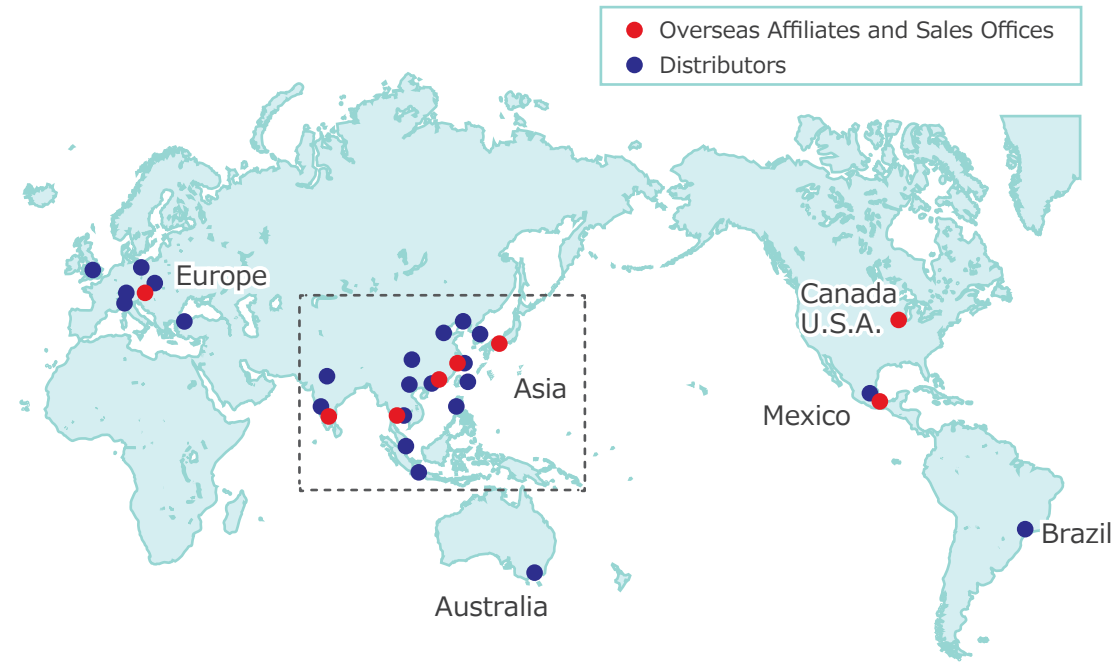
## Sales Offices across the World

| | | |
|---|---|---|
| JAPAN<br>HEAD OFFICE<br>Overseas Sales | **TEL. +81-78-991-5162** | FAX. +81-78-991-8787<br>KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241<br>〒651-2241　兵庫県神戸市西区室谷2丁目1番5号 |
| United States of America<br>SUBSIDIARY<br>KOSMEK (USA) LTD. | **TEL. +1-630-620-7650** | FAX. +1-630-620-9015<br>650 Springer Drive, Lombard, IL 60148 USA |
| MEXICO<br>REPRESENTATIVE OFFICE<br>KOSMEK USA Mexico Office | **TEL. +52-442-161-2347** | Av. Santa Fe #103 int 59 Col. Santa Fe Juriquilla C.P. 76230 Queretaro, Qro Mexico |
| EUROPE<br>SUBSIDIARY<br>KOSMEK EUROPE GmbH | **TEL. +43-463-287587** | FAX. +43-463-287587-20<br>Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria |
| CHINA<br>KOSMEK (CHINA) LTD.<br>考世美(上海)貿易有限公司 | **TEL. +86-21-54253000** | FAX. +86-21-54253709<br>Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China<br>中国上海市浦东新区浦三路21弄55号银亿滨江中心601室 200125 |
| INDIA<br>BRANCH OFFICE<br>KOSMEK LTD - INDIA | **TEL. +91-9880561695** | F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India |
| THAILAND<br>REPRESENTATIVE OFFICE<br>KOSMEK Thailand Representation Office | **TEL. +66-2-300-5132** | FAX. +66-2-300-5133<br>67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand |
| TAIWAN<br>(Taiwan Exclusive Distributor)<br>Full Life Trading Co., Ltd.<br>盈生貿易有限公司 | **TEL. +886-2-82261860** | FAX. +886-2-82261890<br>16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511<br>台湾新北市中和區建八路2號 16F－4（遠東世紀廣場） |
| PHILIPPINES<br>(Philippines Exclusive Distributor)<br>G.E.T. Inc, Phil. | **TEL. +63-2-310-7286** | FAX. +63-2-310-7286<br>Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427 |
| INDONESIA<br>(Indonesia Exclusive Distributor)<br>PT. Yamata Machinery | **TEL. +62-21-29628607** | FAX. +62-21-29628608<br>Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti, Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia |

## Sales Offices in Japan

| | | |
|---|---|---|
| Head Office<br>Osaka Sales Office<br>Overseas Sales | **TEL. 078-991-5162** | FAX. 078-991-8787<br>〒651-2241　兵庫県神戸市西区室谷2丁目1番5号 |
| Tokyo Sales Office | **TEL. 048-652-8839** | FAX. 048-652-8828<br>〒331-0815　埼玉県さいたま市北区大成町4丁目81番地 |
| Nagoya Sales Office | **TEL. 0566-74-8778** | FAX. 0566-74-8808<br>〒446-0076　愛知県安城市美園町2丁目10番地1 |
| Fukuoka Sales Office | **TEL. 092-433-0424** | FAX. 092-433-0426<br>〒812-0006　福岡県福岡市博多区上牟田1丁目8-10-101 |

# Global Network




Asia Detailed Map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