Large Expansion Locating Pin

Model VFH　Hydraulic Double-Acting Model

VFH1000 has been newly added

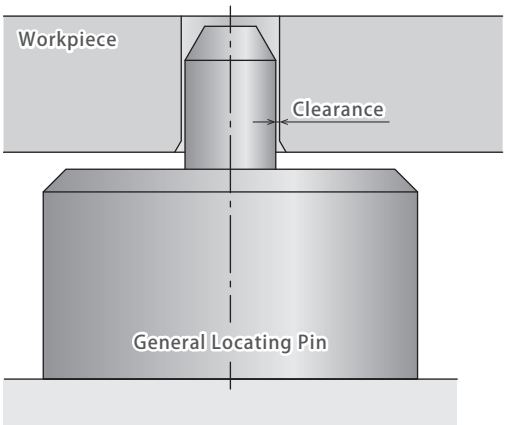
VFH1000　Locating Repeatability : 30 μm
VFH2000/3000　Locating Repeatability : 10 μm

Zero Clearance between Reference Hole and Large Expansion Locating Pin

What is Expansion Locating Pin ?

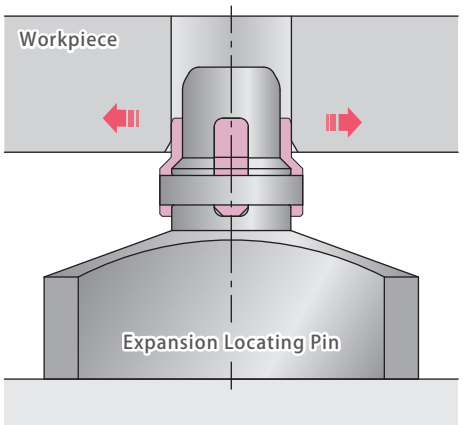
Hydraulic Control High-Accuracy Locating Pin that locates a workpiece by expanding its pin diameter.

The general locating pin has some clearance between pin and workpiece hole.

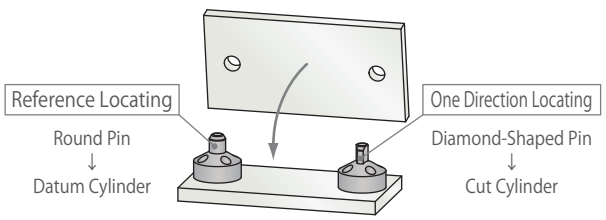


Expansion locating pin has zero clearance!!

High Accuracy　Suitable for Automation
Setup Time Reduction　Cost Reduction



Two types of locating pins (Cylindrical and Diamond shaped pins).
Expansion Locating Pin consisting of Datum-D and Cut-C cylinder.



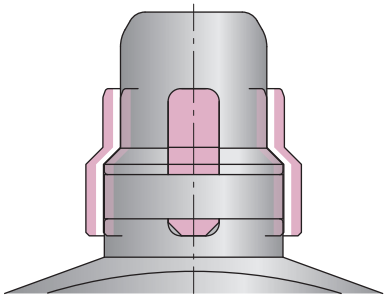
The World's First Locating Mechanism

When expanded : Clearance between the pin and reference hole becomes zero to locate with high accuracy.
When released : Easy to load/unload workpieces with enough clearance.

• Large Expansion

Expansion Stroke : 1.1mm※

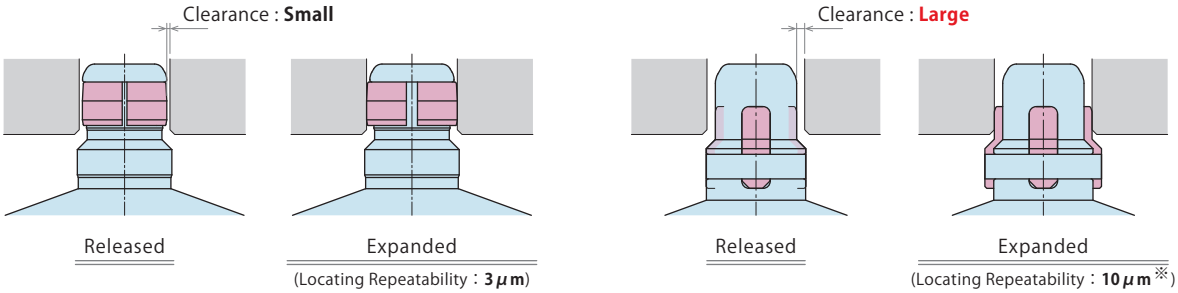
※When selecting VFH1000, expansion stroke is 0.7mm.



• Suitable for Automation • Robot Application

High Accuracy Model **VFM** has small clearance, but has high accuracy of 3μm locating repeatability.

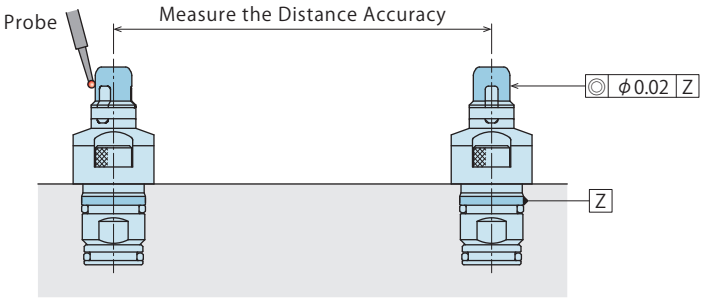
Large Expansion Model **VFH** has large clearance when released, suitable for automation such as transfer robot application. (Locating Repeatability : 10μm※)



※When selecting VFH1000, locating repeatability is 30μm.

• Easy to Measure the Mounting Distance Accuracy

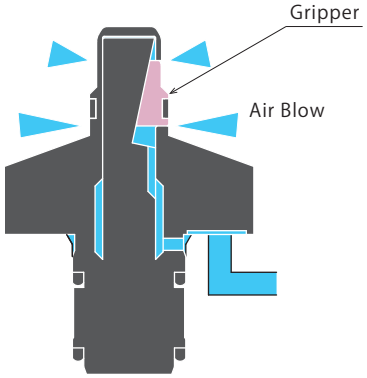
Able to measure the distance accuracy with the same core part on the top.※



※When selecting VFH1000, measurement is not available.

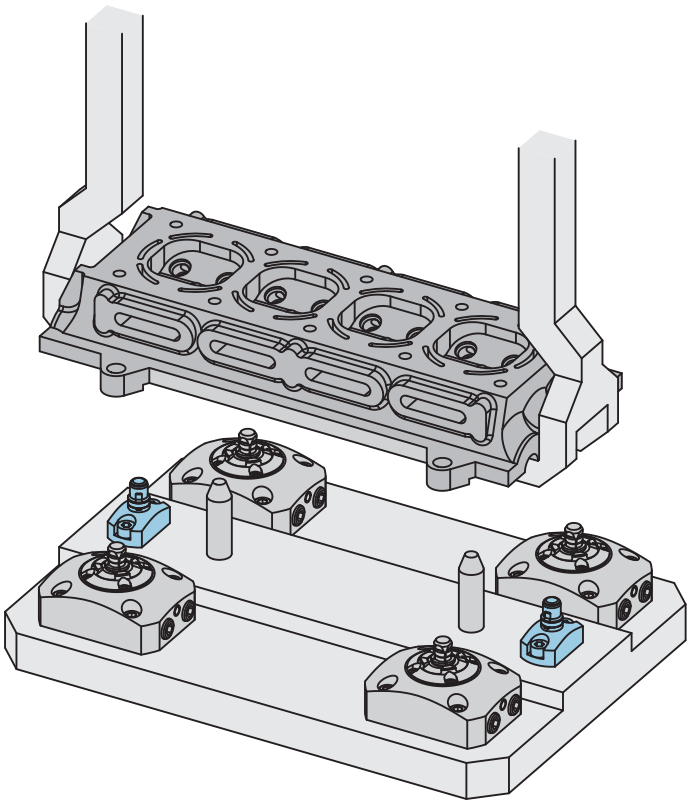
• Durability

Air blow from the inside of the cylinder comes out from the gripper gap and prevents contaminants.

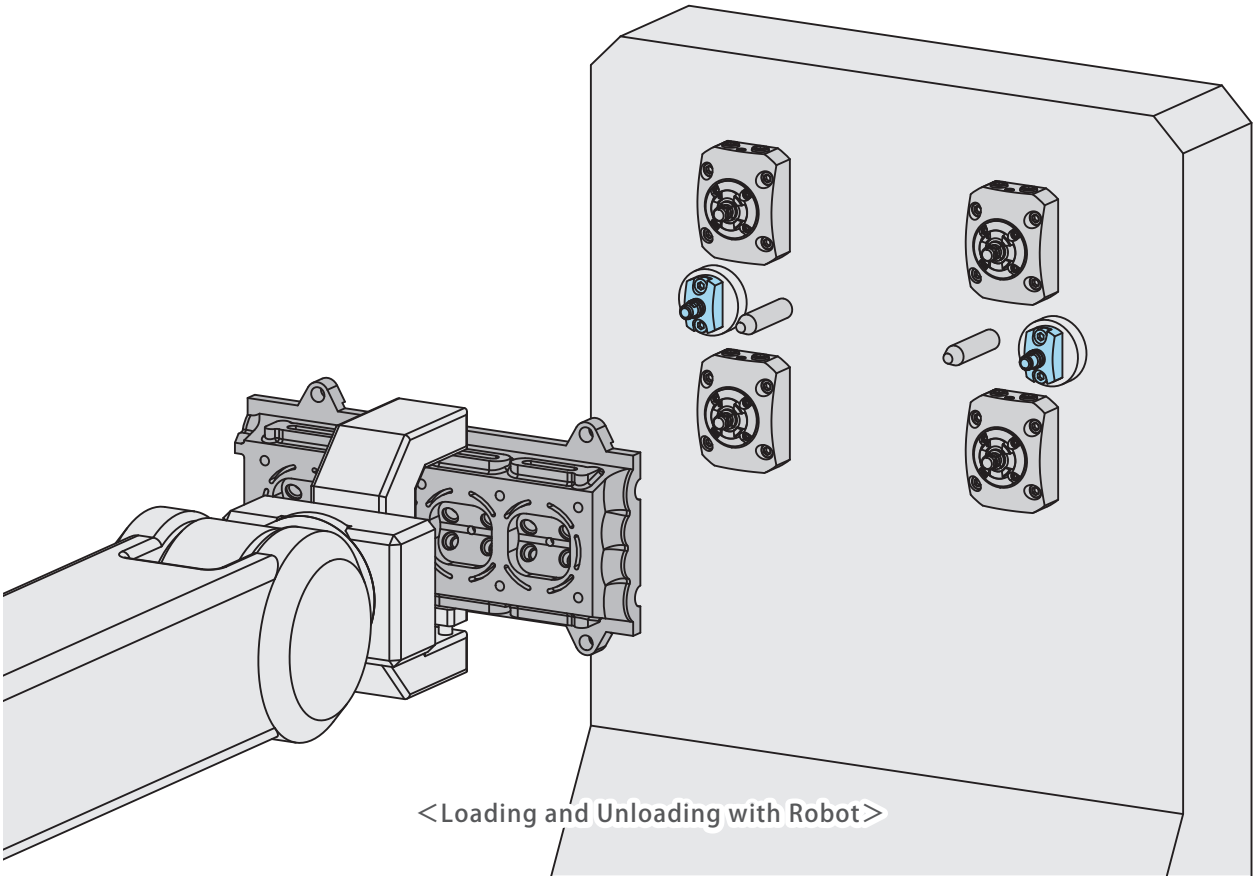


Application Examples

Suitable for Automation and Robot Application

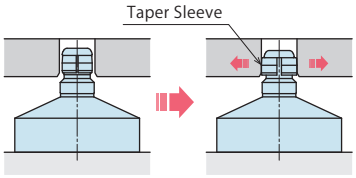
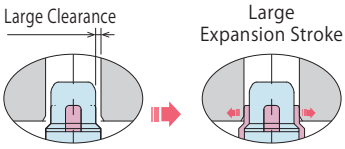
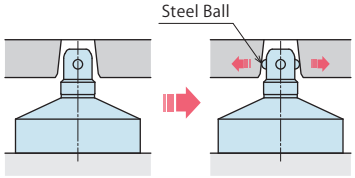


＜Knocking in from the Loader＞



＜Loading and Unloading with Robot＞

Line-up

Hydraulic MAX 7MPa	Model VFL → P.1003	Model VFM → P.1019	Model VFH	Model VFJ → P.1037	Model VFK → P.1053
Model/ Locating Repeatability	High Accuracy Model 3 μm		Multi-Purpose Model VFH1000 : 30 μm VFH2000/3000 : 10 μm	Casting Material Model 10 μm	
Control	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 Range	2.5 ~ 7 MPa		1.5 ~ 7 MPa	2.5 ~ 7 MPa	1.5 ~ 7 MPa
Action	 Released State Locked State The taper sleeve expands.		 Released State Locked State Large Gripper Expansion	 Released State Locked State The steel balls come out from the pin.	
Application Examples	Finishing Line / Dividing Operation Line			Locating Casting Holes / First Operation	

System References

- High Accuracy + One-Touch Locating Pin

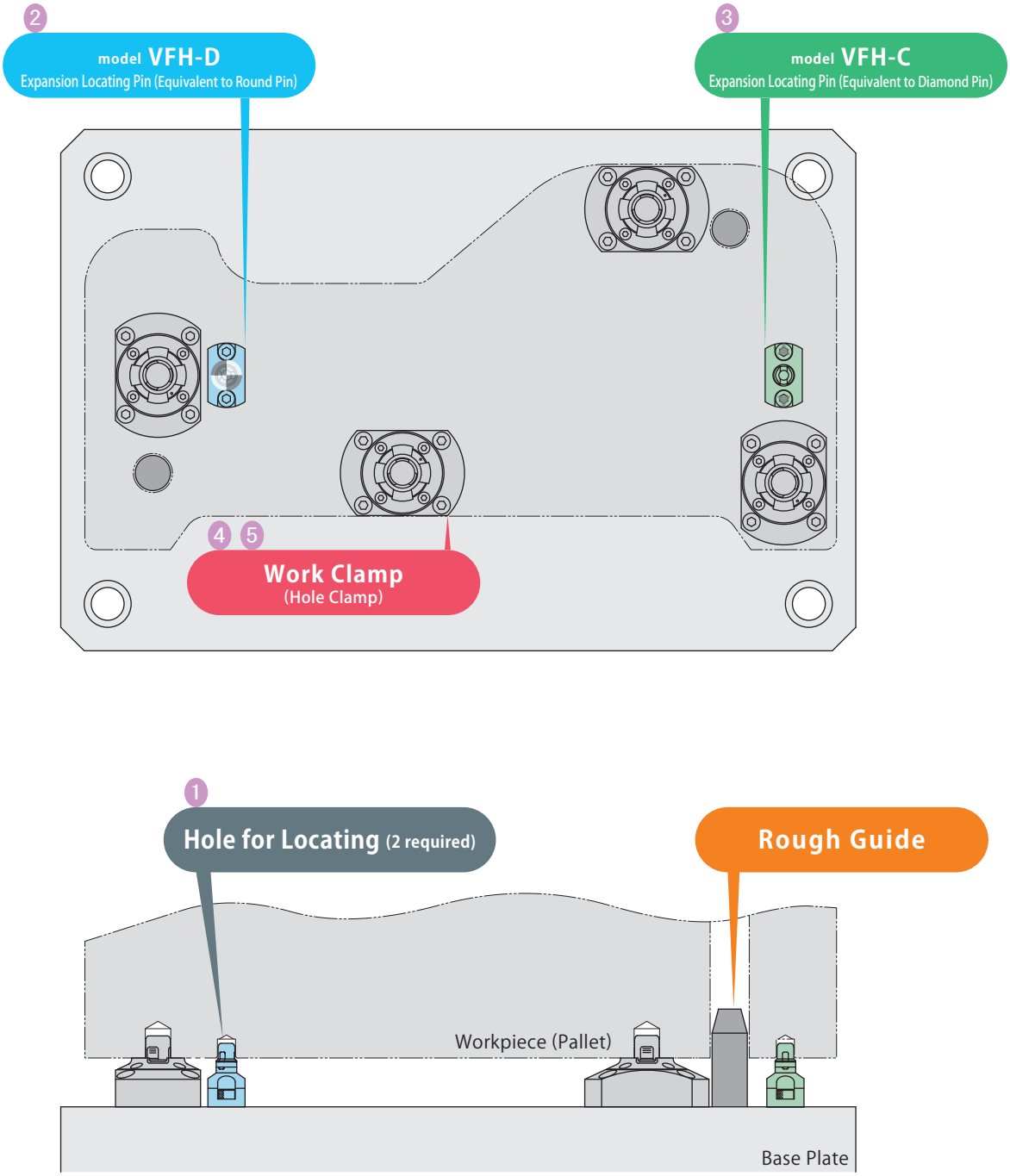
Reduces Setup Time!

- When dividing operations into different fixtures, High Accuracy Locating Pin

Prevents Deterioration of Workpiece Accuracy!

- Using with Hole Clamps enables 5-face machining,

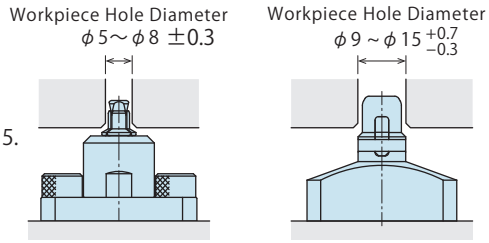
Integrated Operation and More Compact Fixture!



Essential Points

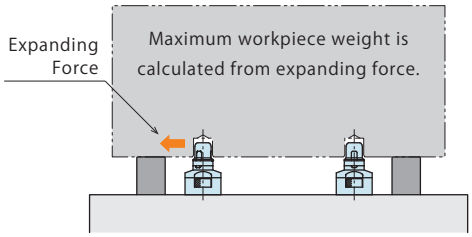
1 Workpiece Hole for Locating

- Workpiece hole diameter is $\phi 5 \sim \phi 15$ (in 1mm increments).
- Workpiece hole tolerance is $^{\pm 0.3}$ for $\phi 5 \sim \phi 8$, and $^{+0.7}_{-0.3}$ for $\phi 9 \sim \phi 15$.



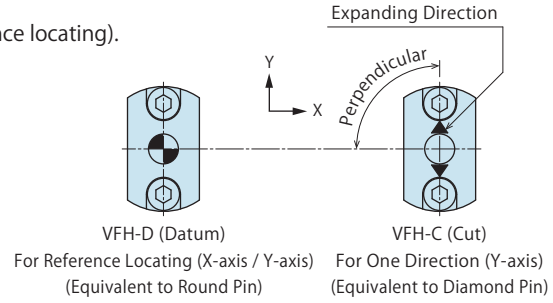
2 Workpiece Weight

- Workpiece weight that expansion locating pin is able to locate with is calculated from expanding force.
- Expanding force is the force with which the expansion locating pin pushes out (expands) against the workpiece.
- Refer to the specification page for each model's calculation method of expanding force and allowable workpiece weight for locating.



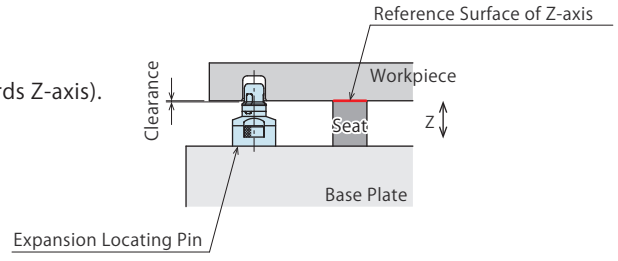
3 Mounting Phase of VFH-C (Cut：For One Direction Locating)

- Reference position (origin) is determined by VFH-D (Datum: for reference locating).
- VFH-C (Cut: for one direction locating) locates in one direction (Y-axis), so phasing is necessary.
  When mounting, ensure the expanding direction of VFH-C (cut) is perpendicular to VFH-D (datum).



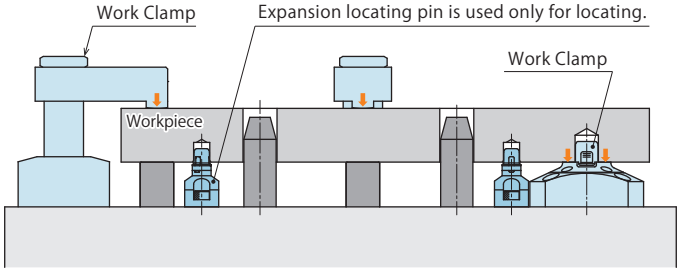
4 Seat Setting

- This product has no seating surface (reference surface towards Z-axis). Please prepare the seat separately.



5 Setting Additional Work Clamps

- Expansion locating pin has no clamping function.
- Additional clamps should be added to clamp workpieces.



Model No. Indication

VFH 2 00 0 - 090 - D - H20

1 2 3 4 5

1 Body Size

1 : Select from Workpiece Hole Diameter φ5 / φ6 / φ7 / φ8
2 : Select from Workpiece Hole Diameter φ9 / φ10 / φ11 / φ12 / φ13
3 : Select from Workpiece Hole Diameter φ14 / φ15

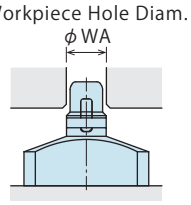
2 Design No.

0 : Revision Number

3 Workpiece Hole Diameter

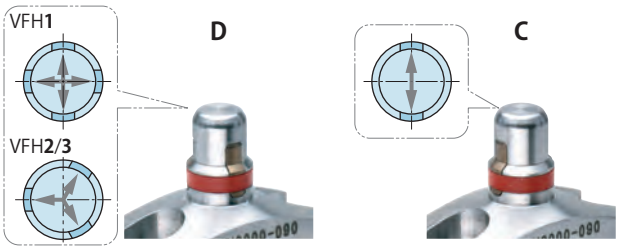
Please contact us for unlisted workpiece hole diameters.

Workpiece Hole Diam. Code	050	060	070	080	090	100	110	120	130	140	150
Workpiece Hole Diam. φWA	$5^{\pm0.3}$	$6^{\pm0.3}$	$7^{\pm0.3}$	$8^{\pm0.3}$	$9^{+0.7}_{-0.3}$	$10^{+0.7}_{-0.3}$	$11^{+0.7}_{-0.3}$	$12^{+0.7}_{-0.3}$	$13^{+0.7}_{-0.3}$	$14^{+0.7}_{-0.3}$	$15^{+0.7}_{-0.3}$
VFH1000	Selection Range										
VFH2000					Selection Range						
VFH3000										Selection Range	



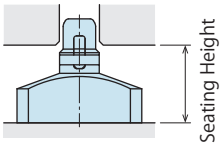
4 Functions

D : Datum (for Reference Locating)
C : Cut (for One Direction Locating)



Datum Cut

5 Seating Height



H15※ : 15mm
H20 : 20mm
H25※ : 25mm

※Only **H20** can be selected for VFH1000.

Note :
Please prepare a seat separately.

Specifications

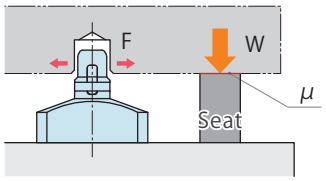
(mm)

Model No.		VFH1000				VFH2000					VFH3000	
3 Workpiece Hole Diam. Code		050	060	070	080	090	100	110	120	130	140	150
Workpiece Hole Diam. (Straight Hole) mm		$\phi5^{\pm0.3}$	$\phi6^{\pm0.3}$	$\phi7^{\pm0.3}$	$\phi8^{\pm0.3}$	$\phi9^{+0.7}_{-0.3}$	$\phi10^{+0.7}_{-0.3}$	$\phi11^{+0.7}_{-0.3}$	$\phi12^{+0.7}_{-0.3}$	$\phi13^{+0.7}_{-0.3}$	$\phi14^{+0.7}_{-0.3}$	$\phi15^{+0.7}_{-0.3}$
Locating Repeatability ※1 mm		0.03				0.01						
Allowable Offset (C : Cut) mm	at Min. Hole Diam.	±0.10				±0.05						
	at Max. Hole Diam.	±0.10				±0.55						
Expanding Force (F) ※2 N	at 1.5MPa	90	90	90	90	90	90	90	90	90	160	160
	at 5.0MPa	340	340	340	340	340	340	340	340	340	580	580
	at 7.0MPa	480	480	480	480	480	480	480	480	480	810	810
Allowable Thrust Load ※3 N		30	50	50	150	800	800	900	1000	1000	1200	1300
Allowable Workpiece Weight for Locating kg		3	5	5	15	Refer to "Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating" on P.1111R.						
Cylinder Capacity (Empty Action) cm^3	Release	0.16	0.16	0.16	0.16	0.21	0.21	0.21	0.21	0.21	0.4	0.4
	Lock	0.07	0.07	0.07	0.07	0.1	0.1	0.1	0.1	0.1	0.16	0.16
Operating Pressure Range MPa		1.5 ~ 7.0										
Withstanding Pressure MPa		10.5										
Recommended Air Blow Pressure MPa		0.2 ~ 0.3										
Operating Temperature Range ℃		0 ~ 70										
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32										

Notes :
※1. It shows the locating repeatability under specific condition (when no load is applied).
※2. Expanding force shows the calculated value when coefficient friction is μ0.2.
※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 product is used only for locating and does not have a clamping function.

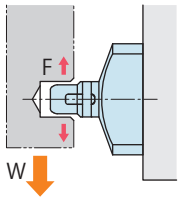
Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

Horizontal Attitude



$$\text{Workpiece Weight (W) [kg]} \leqq \frac{\text{Expanding Force per Expansion Locating Pin (F) [N]} \times \text{Efficiency } 0.25}{\text{Friction Coefficient of Workpiece Seat Face } (\mu) \times 9.8}$$

Vertical Attitude



$$\text{Workpiece Weight (W) [kg]} \leqq \frac{\text{Expanding Force per Expansion Locating Pin (F) [N]}}{9.8} \times \text{Efficiency } 0.25$$

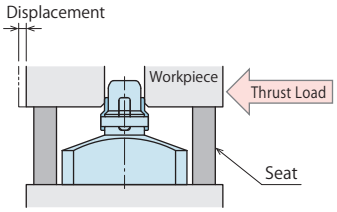
Thrust Load/Displacement Curve

This graph shows the relationship between thrust load and displacement. Thrust load is the static load applied perpendicular to the center axis of the VFH (Hydraulic Expansion Locating Pin).

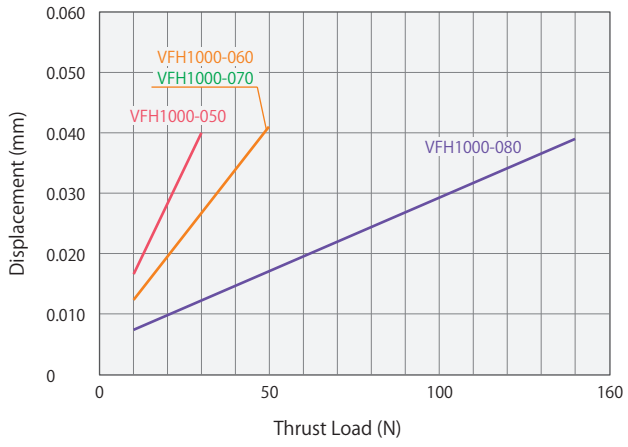
Note :
This graph shows the thrust load (static load) applied to a single datum cylinder (VFH-D) that is not used with any other cylinders, etc.

【How to Read the Thrust Load/Displacement Curve】

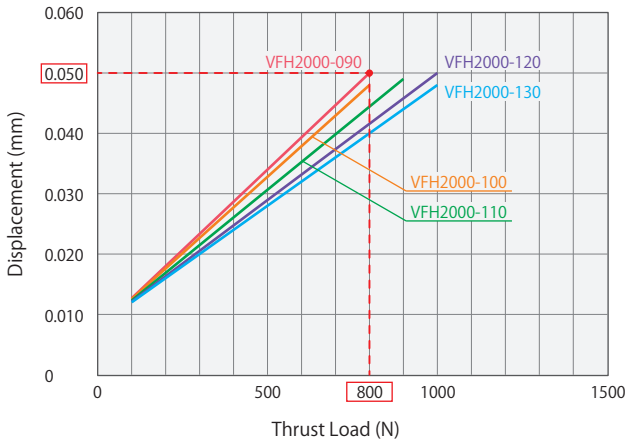
ex.) When using VFH2000-090
Requirement : When an 800N thrust load is applied to an expanded VFH2000-090, the displacement will be about 0.050mm.



VFH1000



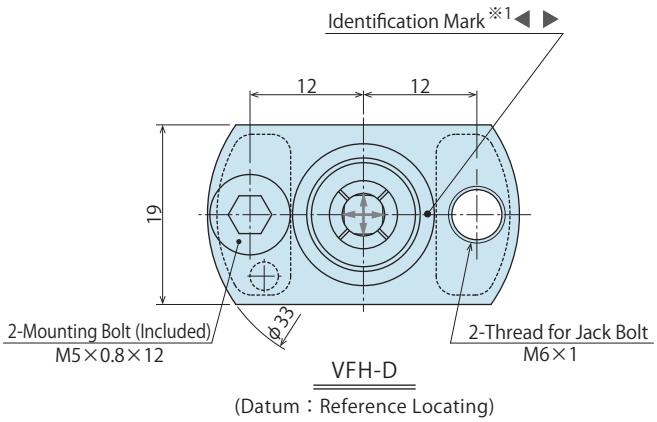
VFH2000



VFH3000

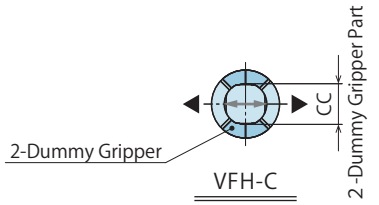
External Dimensions

※The drawing shows the released state of VFH1000.



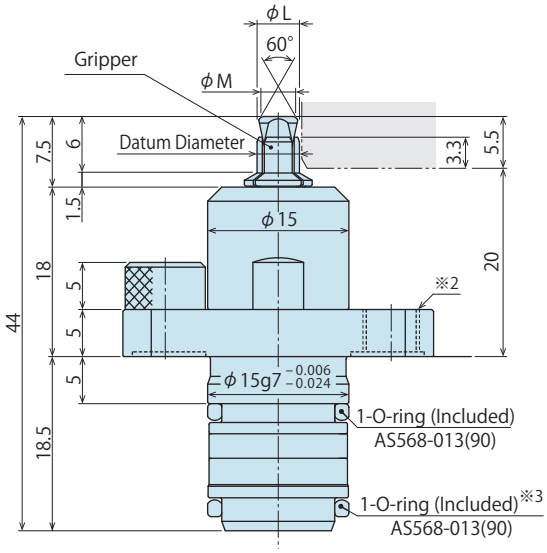
VFH-D

(Datum：Reference Locating)

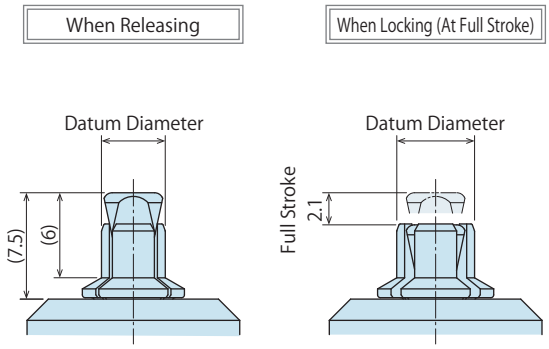


VFH-C

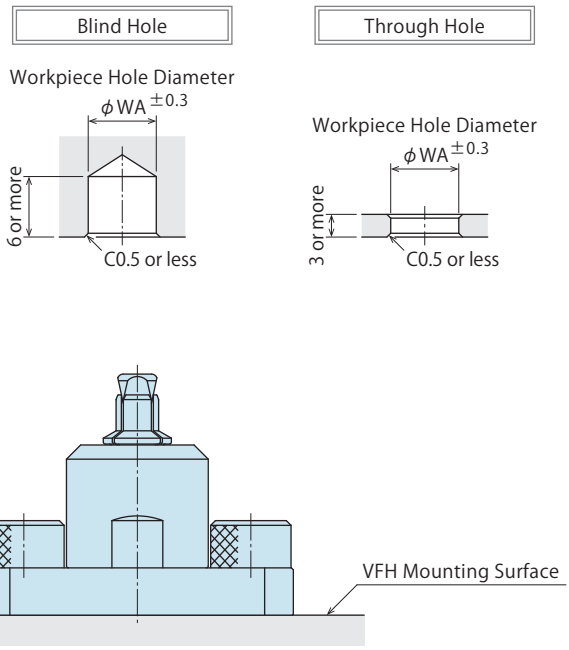
(Cut：One Direction Locating)



Expanding Area Detail



Workpiece Hole Dimensions



Notes :

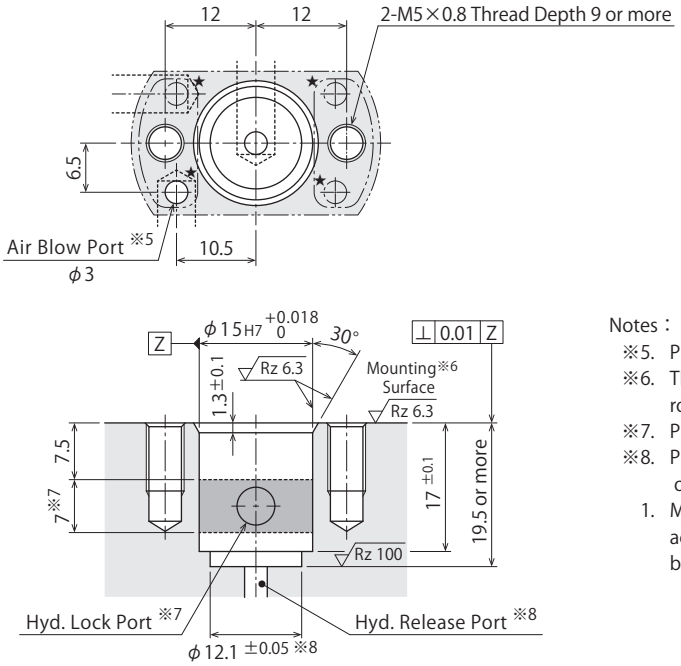
※1. Identification mark is only marked on -C：Cut (for one direction locating). ◀ ▶ indicates the locating direction.

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

※3. 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. This product has no seat. Please prepare a seat separately.

Machining Dimensions for Mounting



Notes :

※5. Prepare an air blow port choosing one port from four ★ parts.
※6. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.
※7. Prepare the hydraulic lock port within ▭ .
※8. Prepare the hydraulic release port on the bottom within the range of ϕ12.1.
1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1115/1116.)

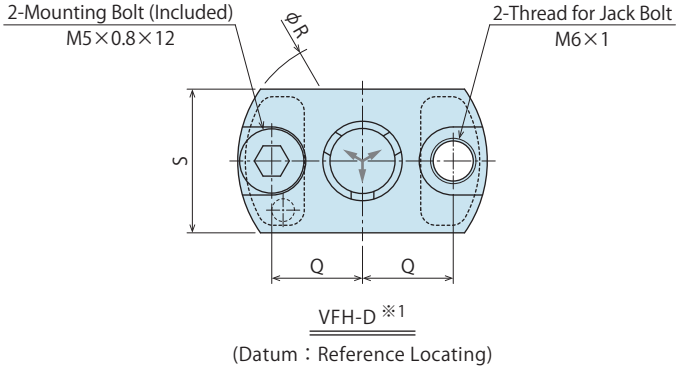
External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		VFH1000-□-□-H20			
3 Workpiece Hole Diam. Code		050	060	070	080
Workpiece Hole Diam. (Standard Diam.) ϕWA		ϕ5 ±0.3	ϕ6 ±0.3	ϕ7 ±0.3	ϕ8 ±0.3
Datum Diam.	When Released	ϕ4.6 or less	ϕ5.6 or less	ϕ6.6 or less	ϕ7.6 or less
	When Fully Stroked	ϕ5.3 or more	ϕ6.3 or more	ϕ7.3 or more	ϕ8.3 or more
Cylinder Stroke		2.1			
L		4.6	5.4	5.4	6.4
M		3.7	4.5	4.5	5.5
CC	When Released	4.3	5.3	6.3	7.3
	When Fully Stroked	5.1	6.1	7.1	8.1
Weight g		60	60	60	60

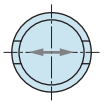
External Dimensions

※ The drawing shows the released state of VFH2000/3000.



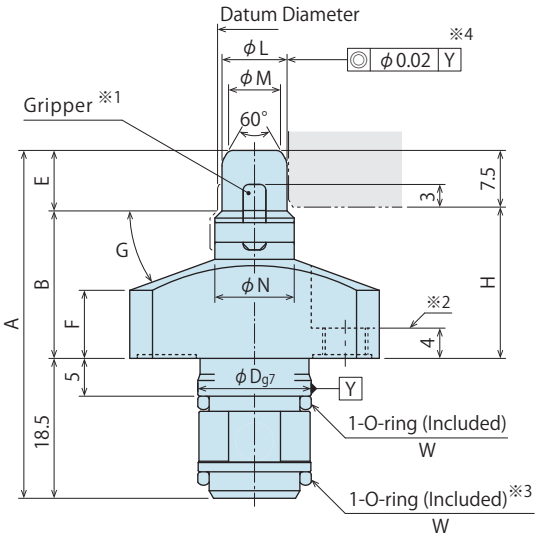
VFH-D ※1

(Datum：Reference Locating)

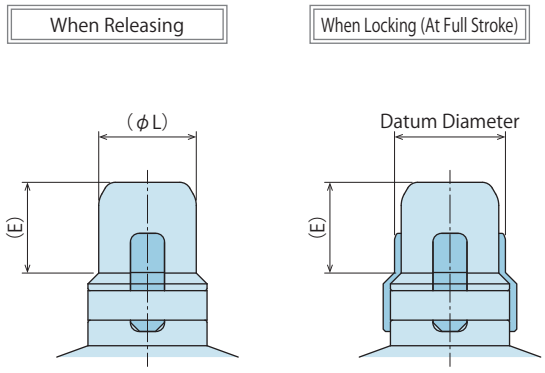


VFH-C ※1

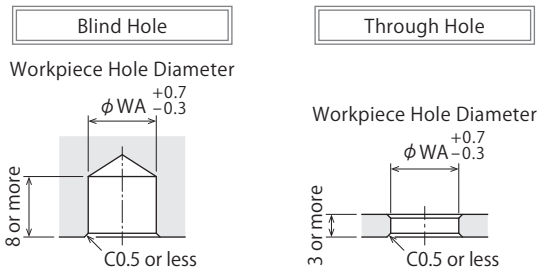
(Cut：One Direction Locating)

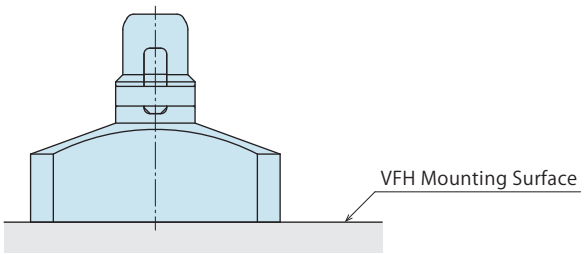


Expanding Area Detail



Workpiece Hole Dimensions





Notes :

※1. The mounting direction of VFH-C (Cut) should be confirmed by the direction of the gripper.

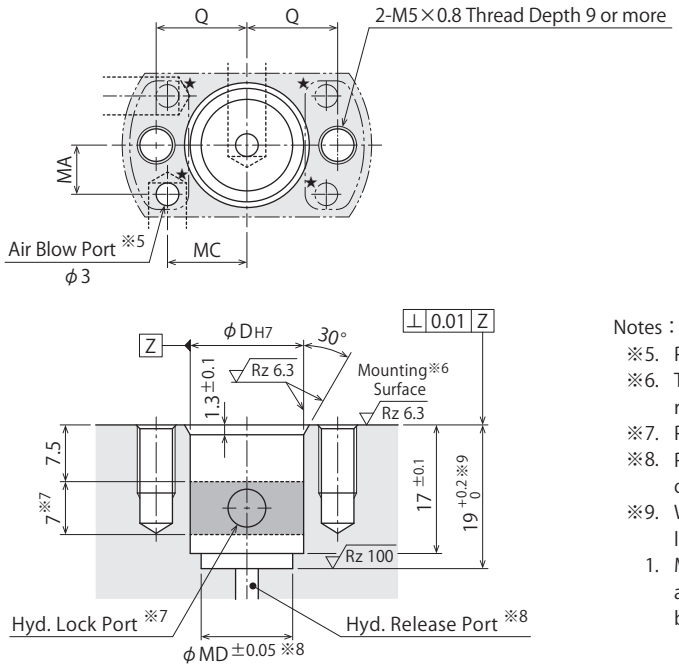
※2. Do not use spring washer or toothed lock washer.

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

※4. The tip of the product can be used to check the mounting distance accuracy after installed. However, it is different from the center accuracy of the gripper part (locating part), so make sure to determine the origin with an actual workpiece before machining.

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. Please prepare a seat separately.

Machining Dimensions for Mounting



Notes：

※5. Prepare an air blow port choosing one port from four ★ parts.
※6. There might be foam near the flange bottom depending on roughness of mounting surface, but this is not a malfunction.
※7. Prepare the hydraulic lock port within ▭.
※8. Prepare the hydraulic release port on the bottom within the range of ϕMD.
※9. When the depth of mounting hole is not properly machined, it may lead to insufficient expansion or damages on the product.
1. Make sure to check the cautions for cylinder mounting distance accuracy, workpiece hole distance accuracy and mounting phase before installation. (Refer to P.1115/1116.)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		VFH2000-□-□-□																VFH3000-□-□-□					
3 Workpiece Hole Diam. Code		090			100			110			120			130			140			150		
5 Seating Height		H15	H20	H25	H15	H20	H25	H15	H20	H25	H15	H20	H25	H15	H20	H25	H15	H20	H25	H15	H20	H25
Workpiece Hole Diam. (Standard Diam.) ϕWA		ϕ9 +0.7 −0.3			ϕ10 +0.7 −0.3			ϕ11 +0.7 −0.3			ϕ12 +0.7 −0.3			ϕ13 +0.7 −0.3			ϕ14 +0.7 −0.3			ϕ15 +0.7 −0.3		
Datum Diam.	When Released	ϕ8.6 or less			ϕ9.6 or less			ϕ10.6 or less			ϕ11.6 or less			ϕ12.6 or less			ϕ13.6 or less			ϕ14.6 or less		
	When Fully Stroked	ϕ9.7 or more			ϕ10.7 or more			ϕ11.7 or more			ϕ12.7 or more			ϕ13.7 or more			ϕ14.7 or more			ϕ15.7 or more		
Cylinder Stroke		3															3					
A		41	46	51	41	46	51	41	46	51	41	46	51	41	46	51	41	46	51	41	46	51
B		14.5	19.5	24.5	14.5	19.5	24.5	14.5	19.5	24.5	14.5	19.5	24.5	14.5	19.5	24.5	14.5	19.5	24.5	14.5	19.5	24.5
D g7（Main Body Side）		15 −0.006 −0.024															19 −0.007 −0.028					
D H7（Machining Hole）		15 +0.018 0															19 +0.021 0					
E		8															8					
F		7.5	9	9.5	7.5	9	9.5	7.5	9	9.5	7.5	9	9.5	7.5	9	9.5	7.5	9	9.5	7.5	9	9.5
G		8°	20°	35°	8°	20°	35°	8°	20°	35°	8°	20°	35°	8°	20°	35°	8°	25°	40°	8°	25°	40°
H		15	20	25	15	20	25	15	20	25	15	20	25	15	20	25	15	20	25	15	20	25
L		8.6			9.6			10.6			11.6			12.6			13.6			14.6		
M		6.9			7.9			8.9			9.9			10.9			11.9			12.9		
N		10.5			11.5			12.5			13.5			14.5			15.5			16.5		
Q		12															14					
R		33															37					
S		19															23					
W		AS568-013（90）															AS568-016（90）					
MA		6.5															7.5					
MC		10.5															12.5					
MD		12.1															16.1					
Weight	g	70	80	100	70	80	100	70	90	100	70	90	100	80	90	100	100	120	140	110	120	140

Cautions

Notes for Design

1) Check Specifications

- Please use each product according to the specifications. VFH locates and releases with hydraulic pressure.

2) Notes for Circuit Design

- Please read "Circuit Reference" to assist with proper hydraulic circuit design.
  Carry out sufficient advance review as the wrong circuit design may lead to product malfunctioning and damage.

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.

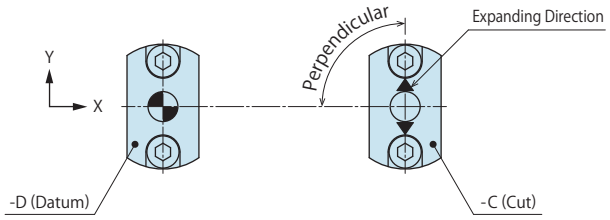
4) Setting Up the Clamps

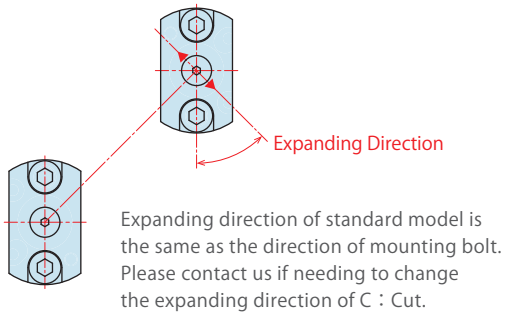
- The expansion locating pin is a positioning cylinder and has no clamping mechanism. A clamp must be provided separately.

5) Mounting Direction (Phase)

- C : Cut (VFH-C) locates a workpiece in the direction of rotation, based on D : Datum (VFH-D). Therefore, it is required to determine the phase of C : Cut when mounting.

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





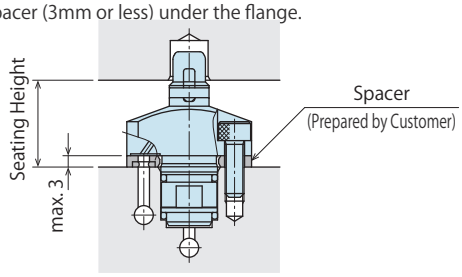
Expanding direction of standard model is the same as the direction of mounting bolt. Please contact us if needing to change the expanding direction of C : Cut.

6) Reference Surface towards Z-axis

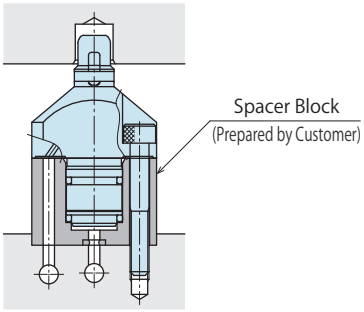
- This product has no seating. Please prepare a seat separately.

7) Adjusting Height of Expansion Locating Pin

- Seating height can be selected from 15mm / 20mm / 25mm. (Only 20mm can be selected for VFH1000)
- For slight adjustment of seating height and expanding part height, install a spacer (3mm or less) under the flange.



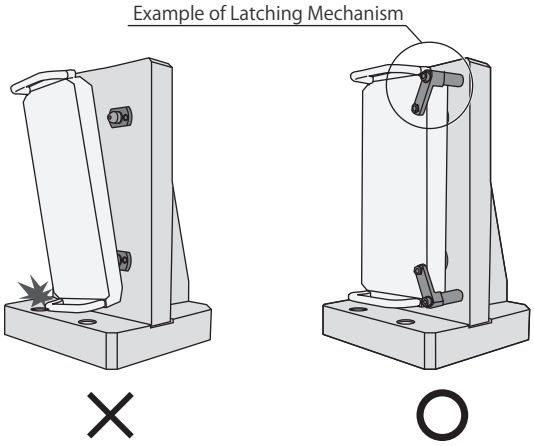
- Install a spacer block under the flange if the height of expansion locating pin is not enough.



8) When the workpiece is in vertical position.

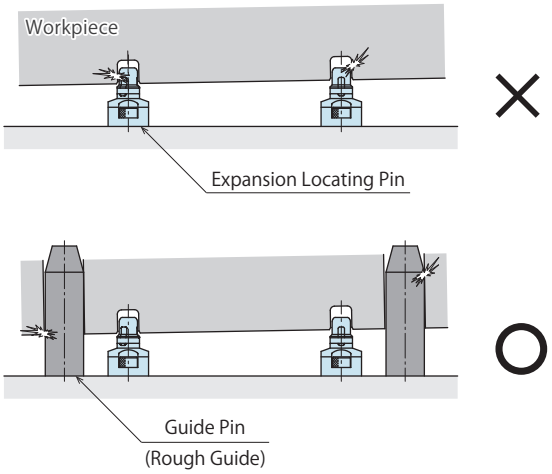
- When setting a workpiece, make sure it is in proper proximity and square to the expansion locating pins.
  If it is locked out of position, the products may be damaged.
- As the workpiece may fall down during releasing, it is recommended to set up the latching mechanism to prevent it from falling down.
- 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.

Example of Latching Mechanism



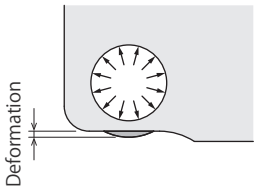
9) Inclination in the Z-axis direction.

- 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.
- The product will be damaged when a workpiece is tilted during loading/unloading (especially when unloaded). Prepare guide pins (rough guides) to keep the workpiece level during loading/unloading.



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 before use.



11) Distance Accuracy of VFH

- Distance accuracy between VFH mounting holes (D : Datum / C: Cut) and between workpiece holes has to be machined corresponding with the allowable offset (VFH-C : Cut).

12) Depth of Mounting Hole

- When the depth of mounting hole is not properly machined, it may lead to insufficient expansion or damages on the product.

Cautions

Installation Notes

1) Usable Fluid

- 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

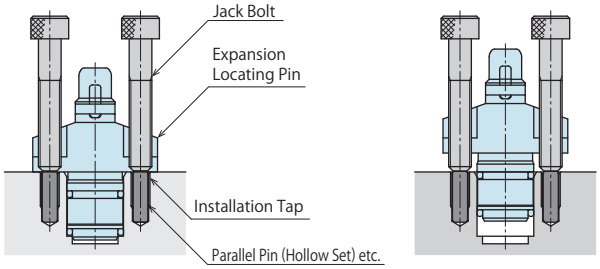
- Wrap with tape 1 to 2 times following the screwing direction.
- Pieces of the sealing tape can lead to fluid leakage and malfunction.
- When piping, be careful that contaminant such as sealing tape does not enter in products.

4) Mounting / Removing Expansion Locating Pin

- Use all the attached hexagonal socket bolts (Strength Grade12.9) and tighten them with torque shown in the table below.
  Tighten them evenly to prevent tilting of the product.

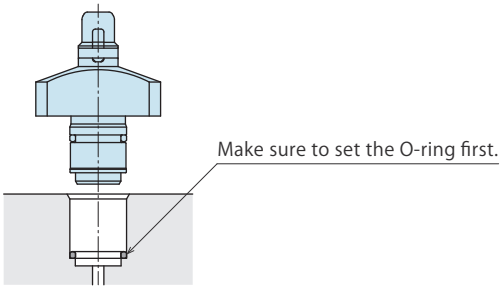
Model No.	Thread Size	Tightening Torque (N·m)
VFH1000	M5×0.8	6.3
VFH2000	M5×0.8	6.3
VFH3000	M5×0.8	6.3

- 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 below picture 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) Installation of O-ring (Included)

- For VFH, set the O-ring to the mounting hole side (fixture side) before mounting the body.



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

Notes on Cylinder Speed Control Circuit

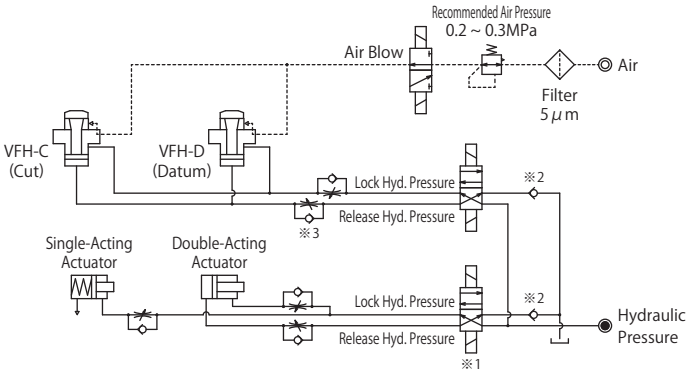
Please pay attention to the cautions below. Design the circuit for controlling the action speed of cylinder.
Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Circuit Reference

Double Action
model **VFH**

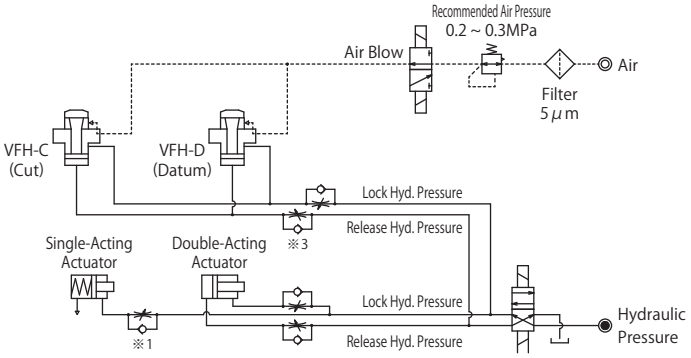
Expansion Locating Pin and other actuators on different circuits.

VFH
Locates with Hyd. Pressure
Releases with Hyd. Pressure



Expansion Locating Pin and other actuators on the same circuit.

VFH
Locates with Hyd. Pressure
Releases with Hyd. Pressure



Notes：
※1. The procedure for lock operation should be "VFH (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.
1. This circuit reference is one example. It should be prepared depending on the fixture structure.

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.

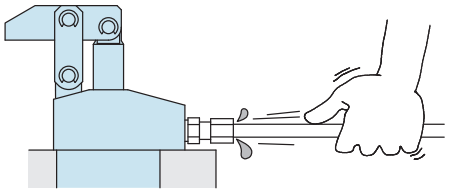
3) Applying Sealing Tape

- 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.

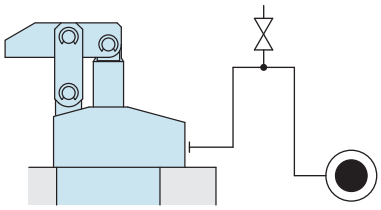
4) Air Bleeding of the Hydraulic Circuit

- 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	

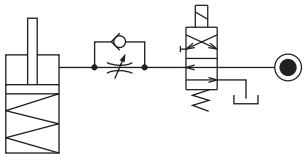
Note : Please contact manufacturers when customers require products in the list above.

Notes on Hydraulic Cylinder Speed Control Unit

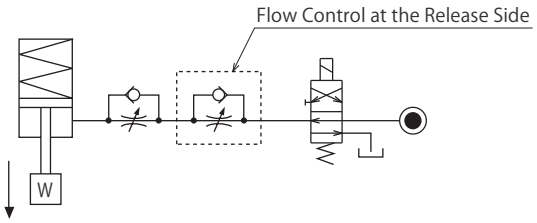
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

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.



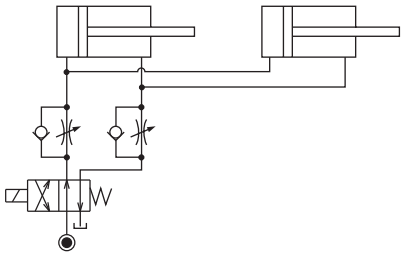
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



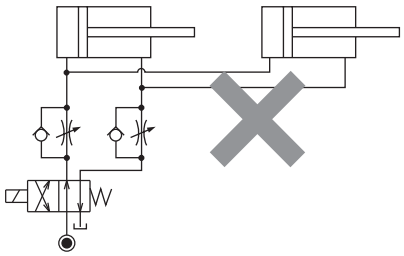
Flow Control Circuit for Double Acting Cylinder

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)

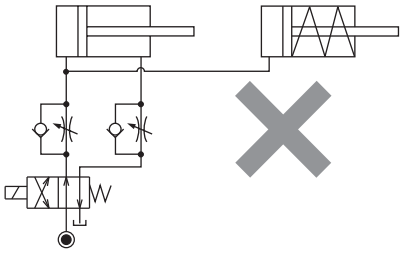


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



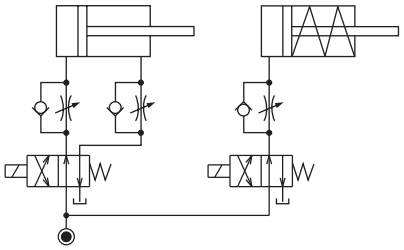
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

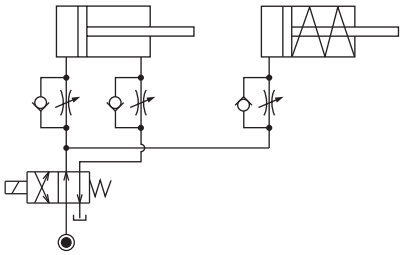


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

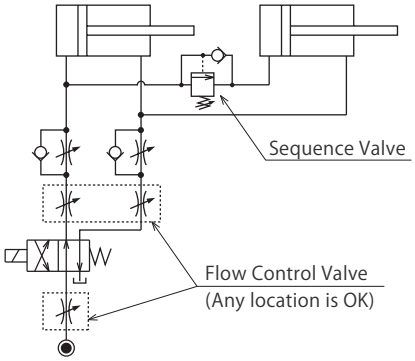
○ Separate the control circuit.



○ 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.



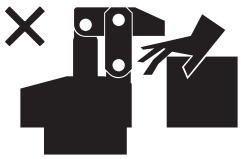
Cautions

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.

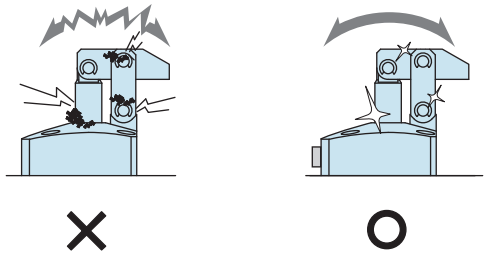


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

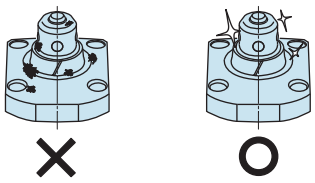
Maintenance and Inspection

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

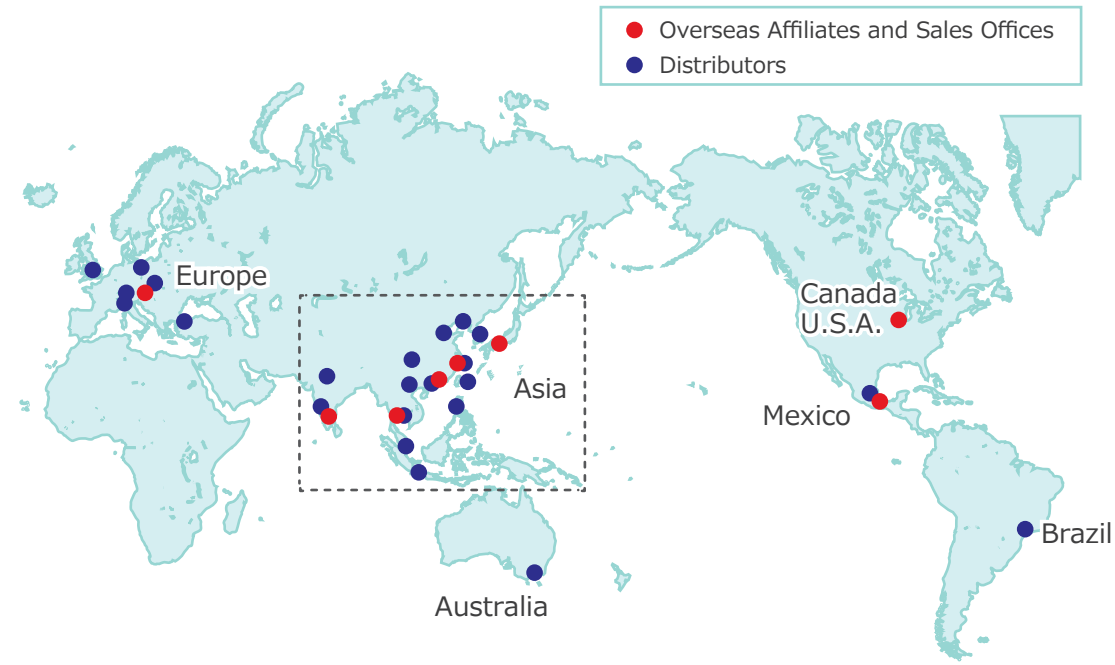
Sales Offices across the World

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

Sales Offices in Japan

Head Office Osaka Sales Office Overseas Sales	**TEL. 078-991-5162**	FAX. 078-991-8787 〒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 〒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 〒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 〒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

KOSMEK
Harmony in Innovation

● FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.
● SPECIFICATIONS IN THIS CATALOG ARE SUBJECT TO CHANGE WITHOUT NOTICE.

ISO 9001
JQA-QMA10823
KOSMEK HEAD OFFICE

MS
JAB
CM009