

Pneumatic Expansion Locating Pin

Model **VWH** Large Expansion Model

Model **VWM** High Accuracy Model

Model **VWK** Casting Material Model



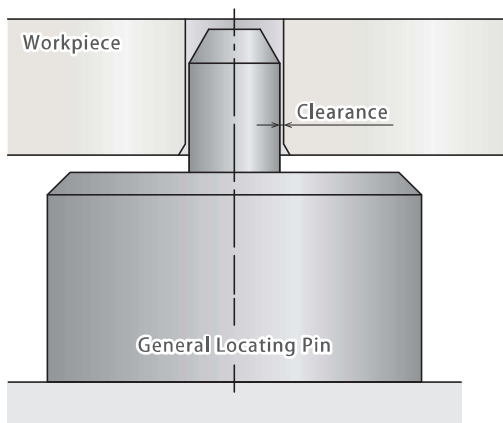
Locating Repeatability VWM : 3 μ m, VWH/VWK : 10 μ m

Zero Clearance between Reference Hole and Large Expansion Locating Pin

What is an Expansion Locating Pin ?

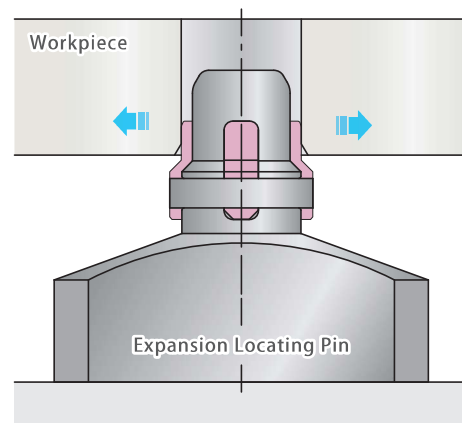
It is an Air Control High-Accuracy Locating Pin that locates a workpiece **by expanding the pin diameter.**

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

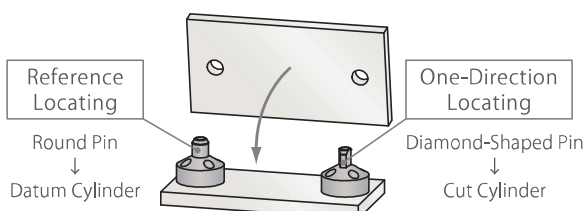


Expansion locating pin has **zero clearance!!**

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

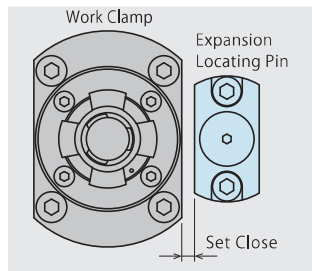
When expanded : Clearance between the pin and reference hole becomes zero to locate with high accuracy.

When released : Easy to load/unload workpieces with enough clearance.

Features

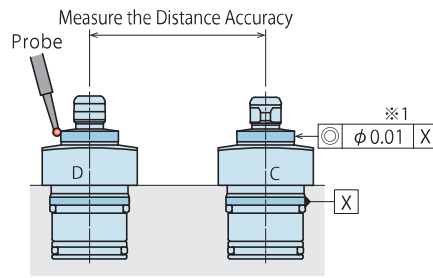
• Simple Arrangement

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



• Easy to Check the Accuracy

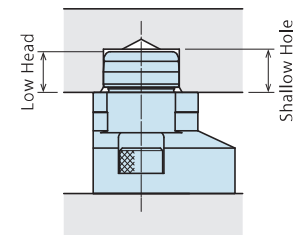
The same core part with X on the flange top allows to determine the origin and measure the distance accuracy.



※1. It is $\phi 0.02$ for VWH and VWK.

• For Shallow Workpiece Hole

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



※1. Not applicable for VWH.

Locating + Clamp

Locating

Hand - Clamp

Support

Valve - Coupler

Cautions - Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VWK

Manual Expansion Locating Pin

VX

Screw Locator

VXE

VXF

Compliance Module

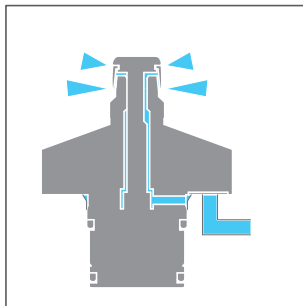
WRC

Function

• Air Blow Function

Equipped to All Options

Prevent contamination.

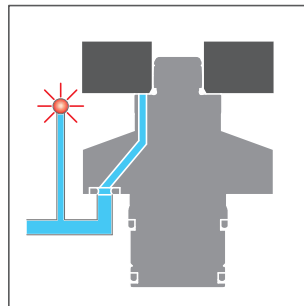


※This drawing shows VWM.

• With Seating Surface (Seat Check)

Only for VWM-B/VWK-B :
With Seating Surface Option

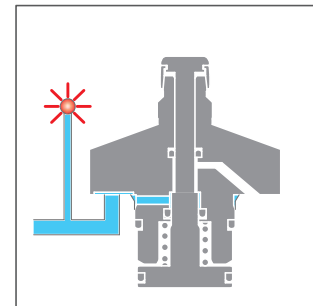
Available by using a gap sensor.




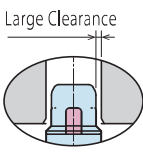
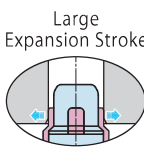
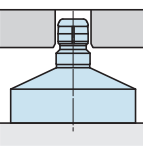
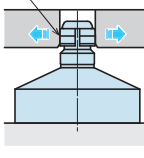
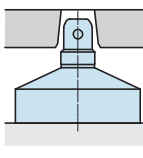
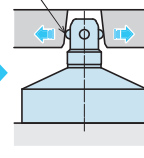


• Release Confirmation

Only for VWM-M/VWK-M :
Release Confirmation Option

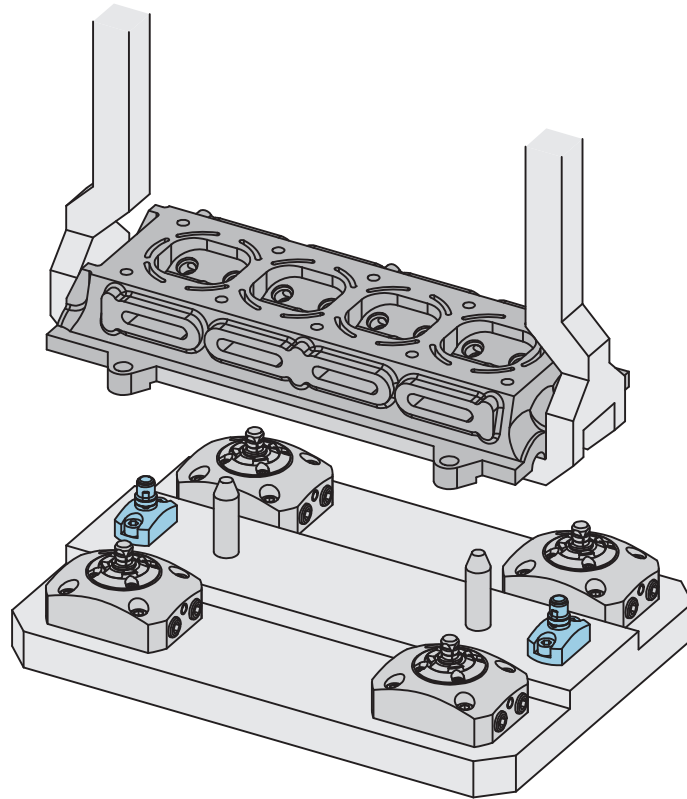
Available by using a gap sensor.



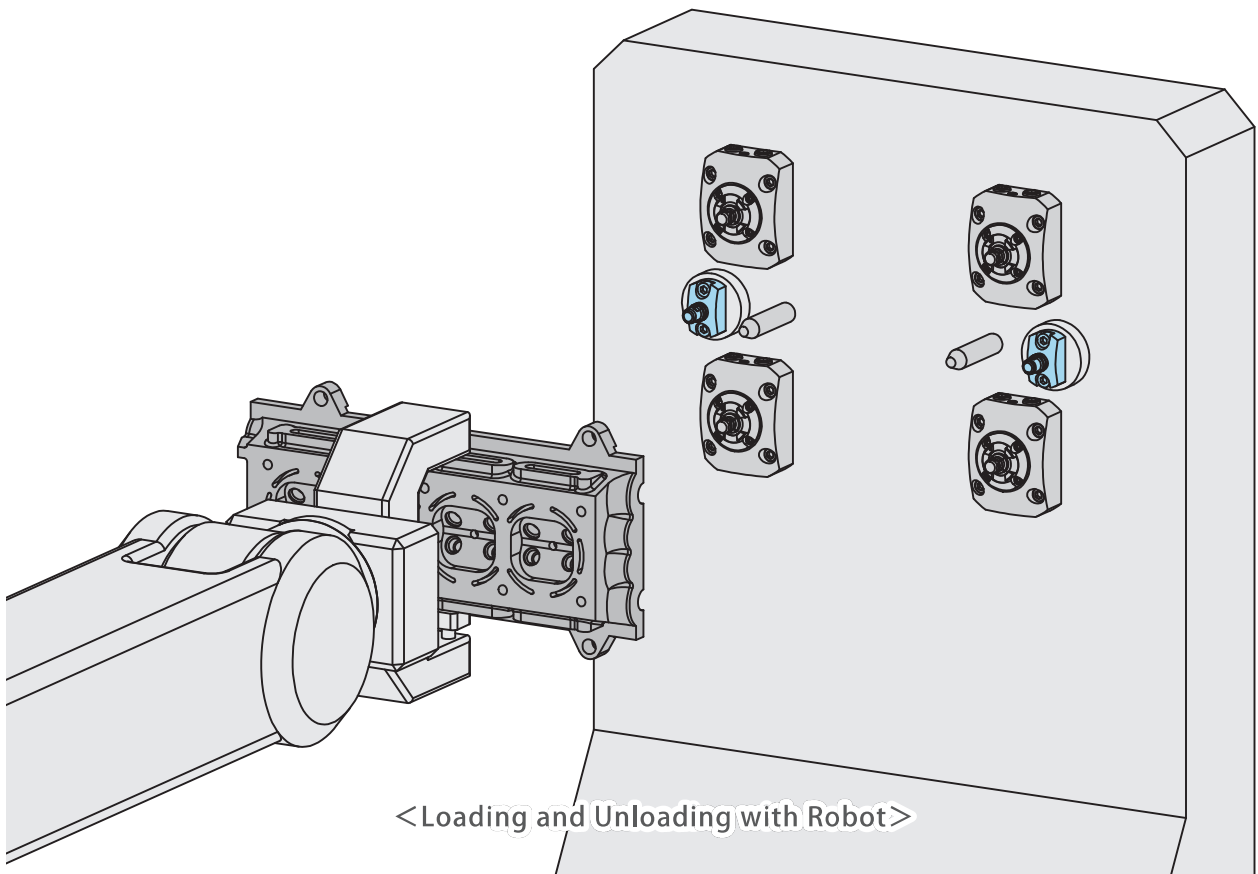
Pneumatic MAX 0.7MPa	 Model VWH → P.179	 Model VWM → P.185	 Model VWK → P.203
Model/ Locating Repeatability	Multi-Purpose Model 10 μ m	High Accuracy Model 3 μ m	Casting Material Model 10 μ m
Control Method	Double Action (Air Lock / Air Release)	Double Action (Air+ Spring Lock / Air Release)	Double Action (Air Lock / Air Release)
Op. Pressure	0.35 ~ 0.7 MPa	0.35 ~ 0.7 MPa	0.35 ~ 0.7 MPa
Action Description	  Released State Locked State Large Gripper Expansion	  Released State Locked State The taper sleeve expands.	  Released State Locked State The steel balls come out from the pin.
Application Examples	Finishing Line / Dividing Operation Line		Locating Casting Core Holes / First Process

- Application Examples : model VWH (Large Expansion Locating Pin)

Suitable for Robot Application



<Knocking in from the Loader>



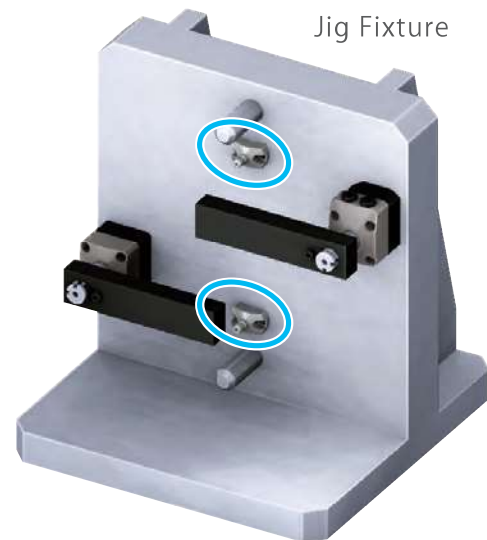
<Loading and Unloading with Robot>

● Application Examples : model VWM/VVK

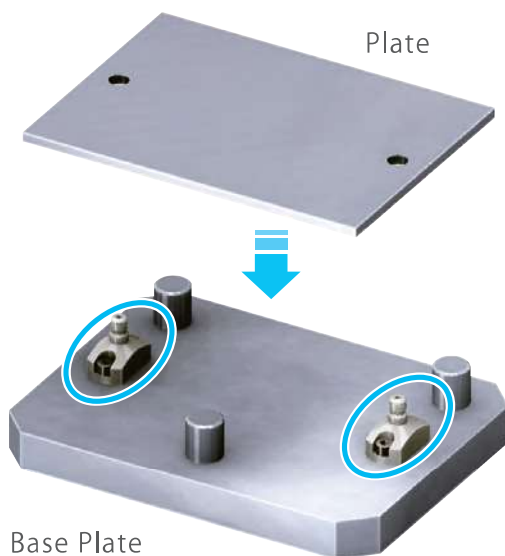
Suitable for Automation



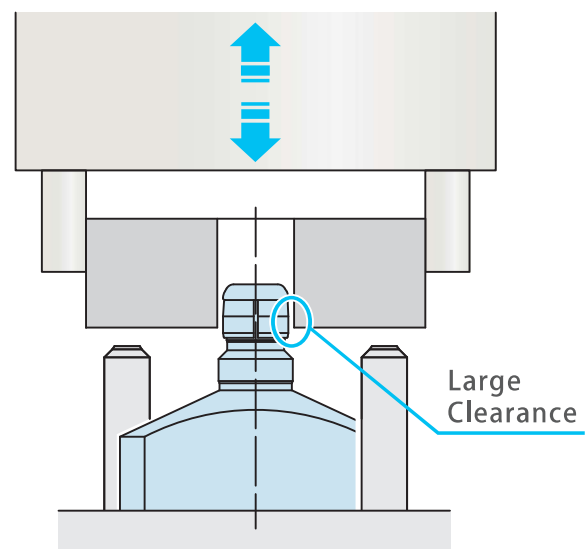
<Locating the Workpiece>



<Angle Plate Fixture>



<Locating the Plate>



<Loading and Unloading Automation>

Locating + Clamp

Locating

Hand - Clamp

Support

Valve - Coupler

Cautions - Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VVK

Manual Expansion Locating Pin

VX

Screw Locator

VXE

VXF

Compliance Module

WRC

System References

- High Accuracy (3 μm or 10 μm) + One-Touch Locating Pin

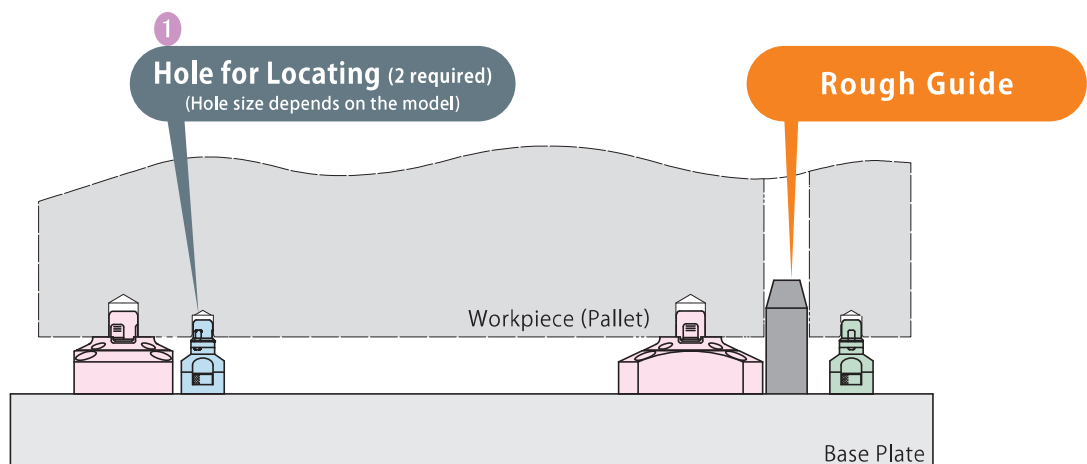
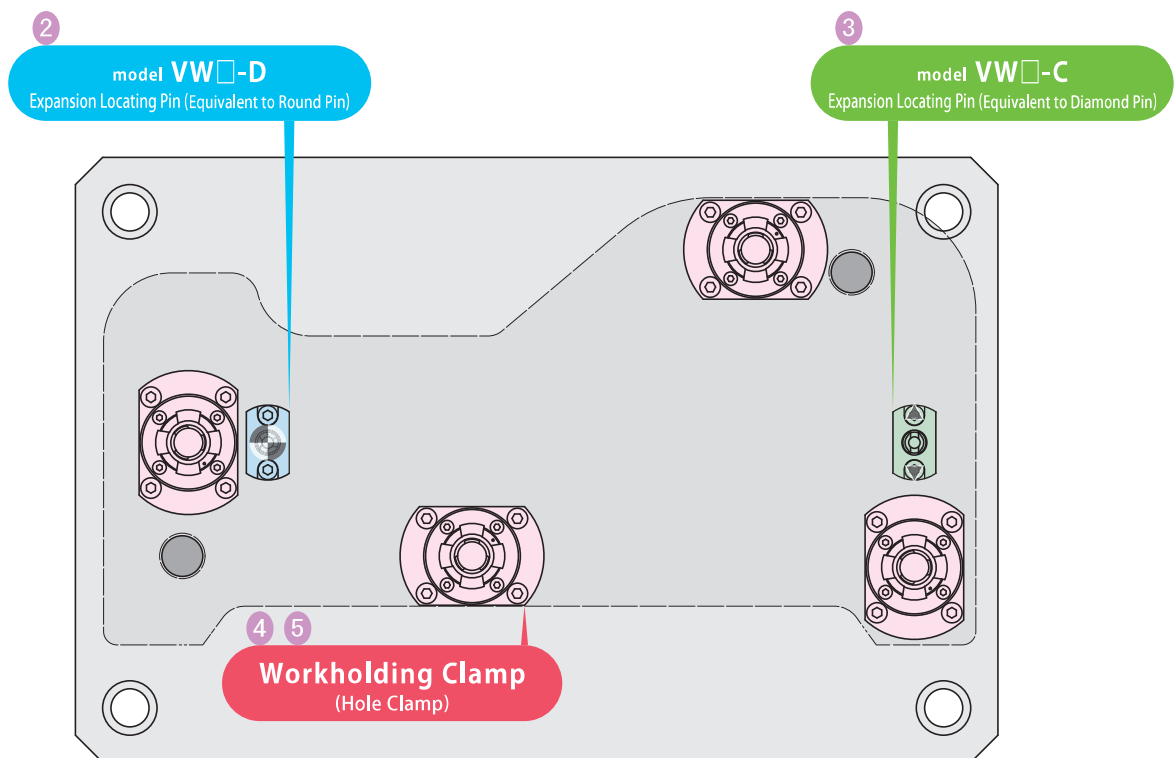
Reduces Setup Time!

- When dividing operations into different fixtures, High Accuracy Locating Pin (3 μm or 10 μm)

Prevents Deterioration of Workpiece Accuracy!

- Using with Hole Clamps enables 5-face machining,

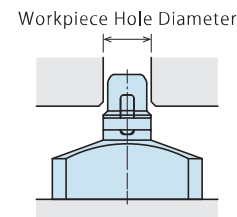
Integrated Operation and More Compact Fixture!



Essential Points

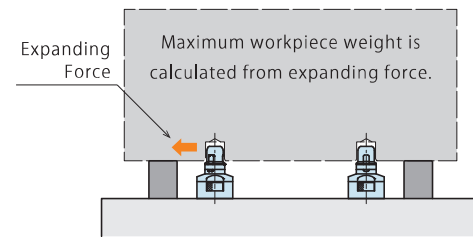
1 Workpiece Hole for Locating

- VWH : Workpiece hole diameter is $\phi 9 \sim \phi 15$ (in 1mm increments).
- VWM : Workpiece hole diameter is $\phi 8 \sim \phi 30$ (in 1mm increments).
- VWK : Workpiece hole diameter is $\phi 7.6 \sim \phi 16.2$.



2 Workpiece Weight

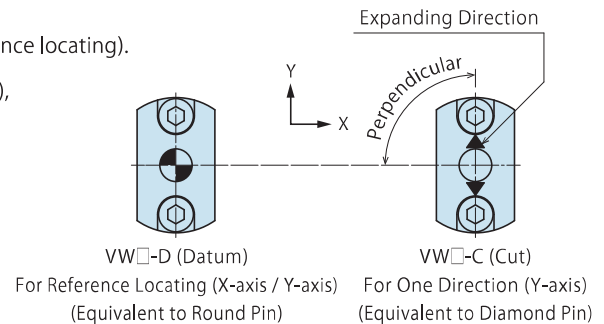
- Workpiece weight that expansion locating pin is able to locate with is calculated from expanding force.
- Expanding force is the force with which the expansion locating pin pushes out (expands) against the workpiece.
- Refer to the specification page for each model's calculation method of expanding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



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

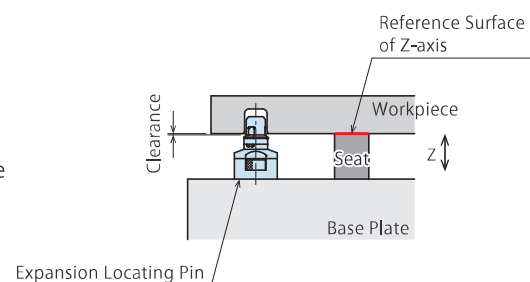
- Reference position (origin) is determined by VW□-D (Datum: for reference locating).
- VW□-C (Cut: for one direction locating) locates in one direction (Y-axis), so phasing is necessary.

When mounting, ensure the expanding direction of VW□-C (cut) is perpendicular to VW□-D (datum).



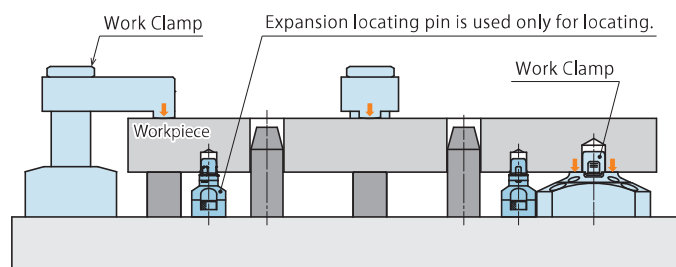
4 Setting an Additional Seat

- The large expansion model (VWH), standard model of VWM/VWK and release confirmation option (VWM-M/VWK-M) have no seating surface (reference surface towards Z-axis). Please prepare a seat separately.



5 Setting Additional Work Clamps

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



Locating + Clamp

Locating

Hand · Clamp

Support

Valve · Coupler

Cautions · Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VWK

Manual Expansion Locating Pin

VX

Screw Locator

VXE

VXF

Compliance Module

WRC

Large Expansion Locating Pin

Model VWH

Pneumatic • Double Action
Locating Repeatability : 10 μ m

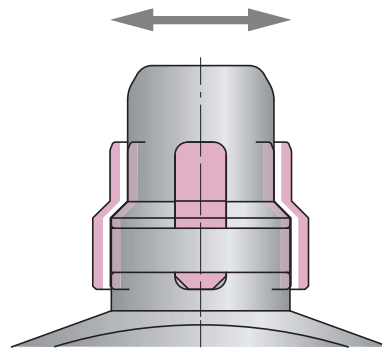


Index

Expansion Locating Pin Digest	P.173
Application Examples	P.175
System References and Essential Points	P.177
Large Expansion Locating Pin Features	P.180
Model No. Indication	P.181
Specifications	P.182
External Dimensions	P.183
Cautions	
• Notes for Pneumatic Expansion Locating Pin	P.221
• Cautions (Common)	P.715
• Notes on Handling • Maintenance/Inspection • Warranty	

• Large Expansion

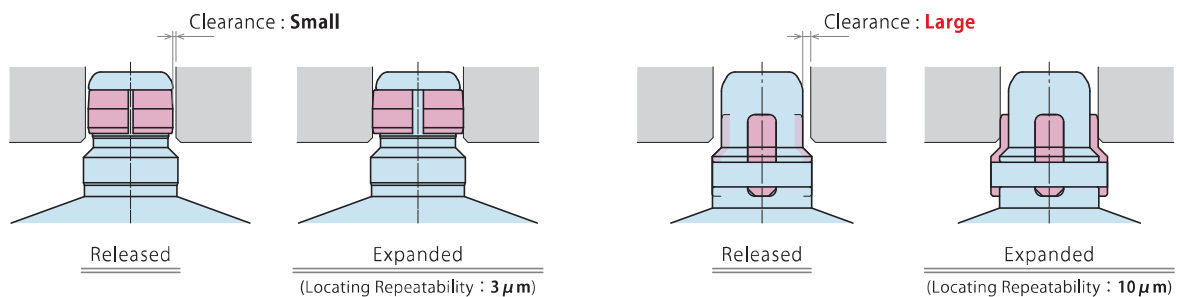
Expansion Stroke : **1.1 mm**



• Suitable for Automation • Robot Application

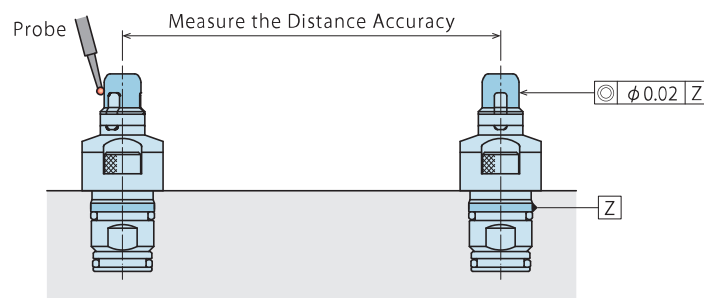
Existing high accuracy model **VWM** has small clearance, but with high locating repeatability : $3\ \mu\text{m}$.

The additional model **VWH** has large clearance when released, suitable for automation such as transfer robot application. (Locating Repeatability : $10\ \mu\text{m}$)



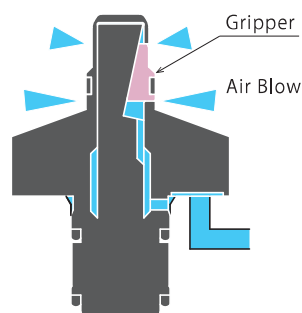
• Easy to Measure the Mounting Distance Accuracy

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



• High Durability

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



Locating + Clamp

Locating

Hand • Clamp

Support

Valve • Coupler

Cautions • Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VVK

Manual Expansion Locating Pin

VX

Screw Locator

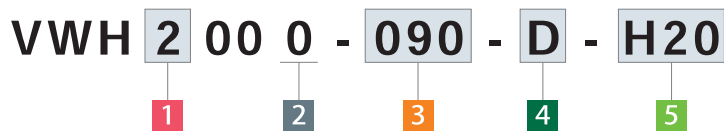
VXE

VXF

Compliance Module

WRC

Model No. Indication



1 Body Size

- 2** : Select from Workpiece Hole Diameter $\phi 9 / \phi 10 / \phi 11 / \phi 12 / \phi 13$
- 3** : Select from Workpiece Hole Diameter $\phi 14 / \phi 15$

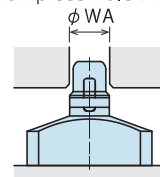
2 Design No.

- 0** : Revision Number

3 Workpiece Hole Diameter Please contact us for unlisted workpiece hole diameters.

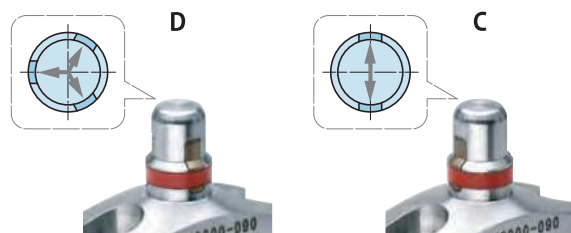
Workpiece Hole Diam. Code	090	100	110	120	130	140	150	
Workpiece Hole Diam. ϕ WA	$9^{+0.7}_{-0.3}$	$10^{+0.7}_{-0.3}$	$11^{+0.7}_{-0.3}$	$12^{+0.7}_{-0.3}$	$13^{+0.7}_{-0.3}$	$14^{+0.7}_{-0.3}$	$15^{+0.7}_{-0.3}$	
VWH2000	Selection Range							
VWH3000						Selection Range		

Workpiece Hole Diam.



4 Functions

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

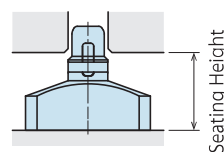


Datum

Cut

5 Seating Height

- H15** : 15mm
- H20** : 20mm
- H25** : 25mm



Note: Please prepare a seat separately.

Specifications

(mm)

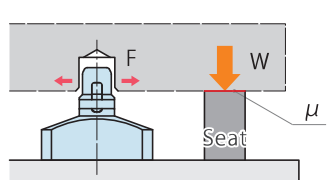
Model No.	VWH2000					VWH3000		
3 Workpiece Hole Diam. Code	090	100	110	120	130	140	150	
Workpiece Hole Diam. (Straight Hole) mm	$\phi 9 \pm 0.3$	$\phi 10 \pm 0.3$	$\phi 11 \pm 0.3$	$\phi 12 \pm 0.3$	$\phi 13 \pm 0.3$	$\phi 14 \pm 0.3$	$\phi 15 \pm 0.3$	
Locating Repeatability ^{※1} mm	0.01							
Allowable Offset (C : Cut) mm	at Min. Hole Diam.		±0.05					
	at Max. Hole Diam.		±0.55					
Expanding Force (F) ^{※2} N	at 0.35MPa		70	70	70	70	110	110
	at 0.5MPa		110	110	110	110	170	170
	at 0.7MPa		160	160	160	160	250	250
Allowable Thrust Load ^{※3} N	800		800	900	1000	1000	1200	1300
Cylinder Capacity (Empty Action) cm ³	Release		0.46	0.46	0.46	0.46	0.46	0.76
	Lock		0.35	0.35	0.35	0.35	0.35	0.53
Operating Pressure Range MPa	0.35 ~ 0.7							
Withstanding Pressure MPa	1							
Recommended Air Blow Pressure MPa	0.2 ~ 0.3							
Operating Temperature Range °C	0 ~ 70							
Usable Fluid	Dry Air							

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 $\mu 0.2$. Refer to the following chart 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 air pressure. (Air Pressure Double-Acting Model)
 2. This cylinder is used only for locating and does not have a clamping function.

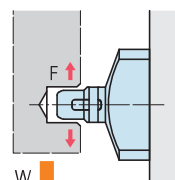
Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

Horizontal Attitude



$$\text{Workpiece Weight (W)} \leq \frac{\text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency } 0.25}{\text{Friction Coefficient of Workpiece Seat Face } (\mu)}$$

Vertical Attitude



$$\text{Workpiece Weight (W)} \leq \text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency } 0.25$$

Thrust Load/Displacement Curve

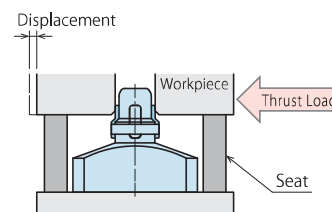
This graph shows the relationship between thrust load and displacement. Thrust load is the static load applied perpendicular to the center axis of the VWH (Pneumatic Expansion Locating Pin).

Note :

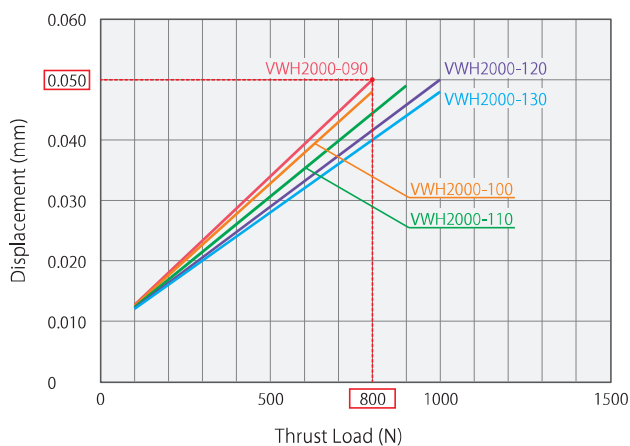
This graph shows the thrust load (static load) applied to a single datum cylinder (VWH-D) that is not used with any other cylinders, etc.

[How to Read the Thrust Load/Displacement Curve]

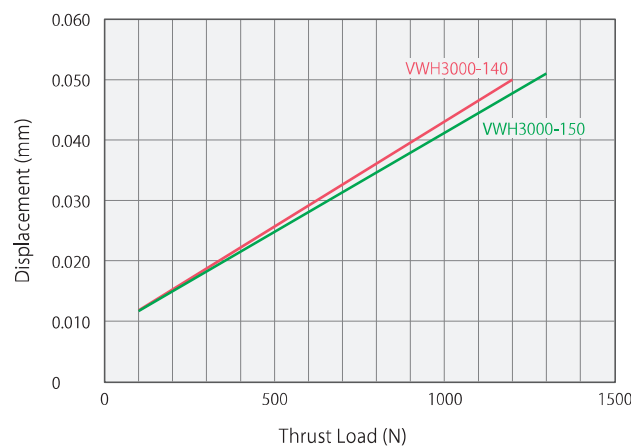
ex.) In case of VWH2000-090
 Requirement : When an 800N thrust load is applied to an expanded VWH2000-090, the displacement will be about 0.050mm.



VWH2000



VWH3000



Locating + Clamp

Locating

Hand · Clamp

Support

Valve · Coupler

Cautions · Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VWK

Manual Expansion Locating Pin

VX

Screw Locator

VXE

VXF

Compliance Module

WRC

Expansion Locating Pin

PAT.

Model VWM

Pneumatic • Double Action
Locating Repeatability : 3 μ m

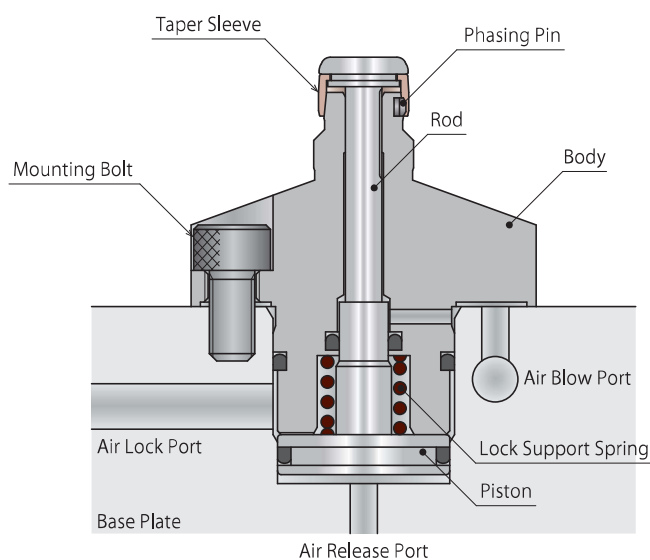


Index

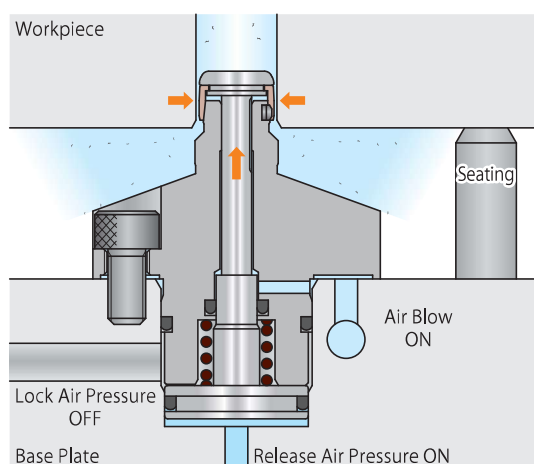
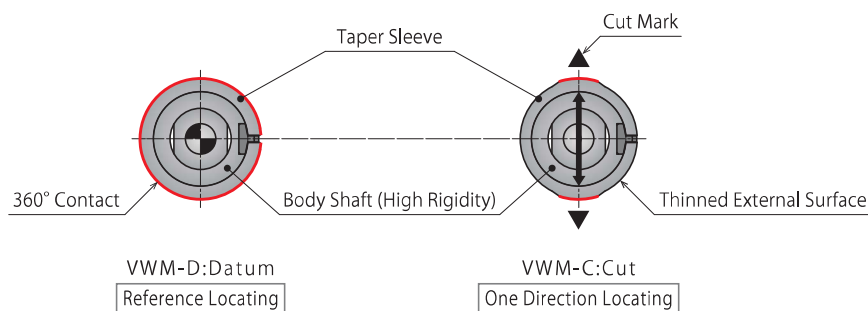
Expansion Locating Pin Digest	P.173
Application Examples	P.176
System References and Essential Points	P.177
Action Description	P.186
Model No. Indication	P.187
Specifications	P.189
External Dimensions	
• Standard	P.191
• with Seating Surface	P.195
• Release Confirmation Model	P.199
Cautions	
• Notes for Expansion Locating Pin	P.221
• Cautions (Common)	P.715
• Notes on Handling • Maintenance/Inspection • Warranty	

Action Description

This is a simplified drawing of VWM (Standard).



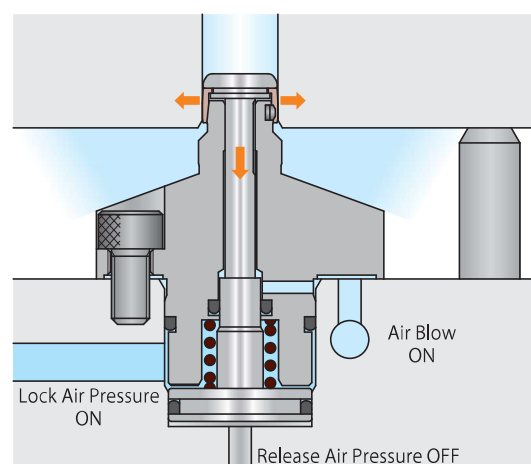
About Reference Locating and Orientation



When loading workpiece

When unloading workpiece

- When lock air pressure is OFF and release air pressure is ON, the taper sleeve ascends with piston/rod and shrinks with its own elasticity.
- Air blow prevents debris contamination.
- Rod head and taper sleeve are designed to load workpiece smoothly and prevent scratches.



When locating

- When release air pressure is OFF and lock air pressure is ON, the piston/rod descend and the taper sleeve is expanded to locate the workpiece with high accuracy. (Seating is required for standard and release confirmation model.)
 ※When release pressure is OFF, it moves to the lock direction only with internal spring force so locating is not stable.

Locating + Clamp

Locating

Hand · Clamp

Support

Valve · Coupler

Cautions · Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VVK

Manual Expansion Locating Pin

VX

Screw Locator

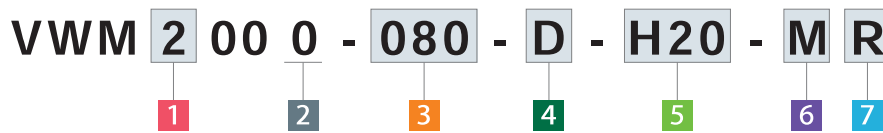
VXE

VXF

Compliance Module

WRC

Model No. Indication



1 Body Size

- 2** : Select from Workpiece Hole Diameter φ8 / φ9 / φ10 / φ11 / φ12 / φ13 / φ14 / φ15
- 3** : Select from Workpiece Hole Diameter φ16 / φ17 / φ18 / φ19 / φ20
- 4** : Select from Workpiece Hole Diameter φ21 / φ22 / φ23 / φ24 / φ25
- 5** : Select from Workpiece Hole Diameter φ26 / φ27 / φ28 / φ29 / φ30

2 Design No.

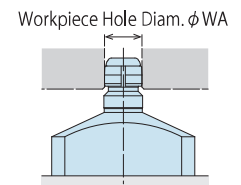
- 0** : Revision Number

3 Workpiece Hole Diameter

Contact us for unlisted workpiece hole diameters.
(Workpiece hole machining accuracy should be H8 or better.)

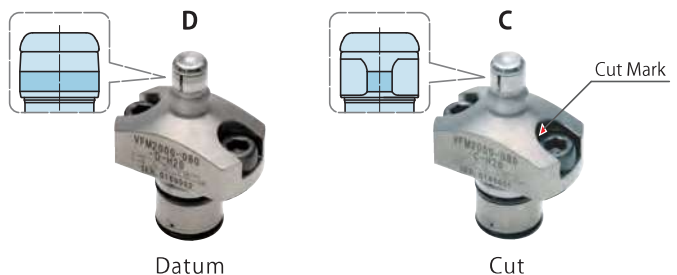
Workpiece Hole Diam. Code	080	090	100	110	120	130	140	150	160	170	180	190	200
Workpiece Hole Diam. φ WA _{H8}	8 ^{+0.022} ₀	9 ^{+0.022} ₀	10 ^{+0.022} ₀	11 ^{+0.027} ₀	12 ^{+0.027} ₀	13 ^{+0.027} ₀	14 ^{+0.027} ₀	15 ^{+0.027} ₀	16 ^{+0.027} ₀	17 ^{+0.027} ₀	18 ^{+0.027} ₀	19 ^{+0.033} ₀	20 ^{+0.033} ₀
VWM2000	Selection Range												
VWM3000						Selection Range							

Workpiece Hole Diam. Code	210	220	230	240	250	260	270	280	290	300
Workpiece Hole Diam. φ WA _{H8}	21 ^{+0.033} ₀	22 ^{+0.033} ₀	23 ^{+0.033} ₀	24 ^{+0.033} ₀	25 ^{+0.033} ₀	26 ^{+0.033} ₀	27 ^{+0.033} ₀	28 ^{+0.033} ₀	29 ^{+0.033} ₀	30 ^{+0.033} ₀
VWM4000	Selection Range									
VWM5000						Selection Range				



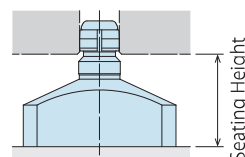
4 Functions

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



5 Seating Height

Model No.	Seating Height H (mm)			
	15	20	25	30
VWM2000	Selection Range			
VWM3000	Selection Range			
VWM4000	Selection Range			
VWM5000	Selection Range			



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

Not required only when selecting **6** Option : Blank (Standard) of VWM2000 / VWM3000.

R : Refer to External Dimensions

L : Refer to External Dimensions

Note :

Refer to [Port Position](#) on each External Dimension page for details.

Specifications : VWM2000 / VWM3000

Model No.	VWM2000								VWM3000					
Workpiece Hole Diam. Code	080	090	100	110	120	130	140	150	160	170	180	190	200	
Workpiece Hole Diam. (Standard Diam.) mm	φ8 _{H8/0} ^{+0.022}	φ9 _{H8/0} ^{+0.022}	φ10 _{H8/0} ^{+0.022}	φ11 _{H8/0} ^{+0.027}	φ12 _{H8/0} ^{+0.027}	φ13 _{H8/0} ^{+0.027}	φ14 _{H8/0} ^{+0.027}	φ15 _{H8/0} ^{+0.027}	φ16 _{H8/0} ^{+0.027}	φ17 _{H8/0} ^{+0.027}	φ18 _{H8/0} ^{+0.027}	φ19 _{H8/0} ^{+0.033}	φ20 _{H8/0} ^{+0.033}	
Locating Repeatability mm	0.003													
Allowable Offset (C : Cut) mm	±0.05	±0.05	±0.10	±0.10	±0.10	±0.10	±0.10	±0.10	±0.15	±0.15	±0.15	±0.15	±0.15	
Expanding Force (F) N	at 0.35MPa	140	150	170	150	150	170	150	150	180	190	190	190	200
	at 0.5MPa	220	230	250	230	220	250	230	220	280	290	290	290	300
	at 0.7MPa	330	330	350	330	330	350	340	330	420	430	430	430	440
Allowable Thrust Load N	1500	1500	2000	2000	2500	2500	2500	2500	3500	3500	3500	3500	4000	
Cylinder Capacity (Empty Action) cm ³	Release side	0.18			0.21				0.38					
	Lock side	0.17			0.20				0.34					
Operating Pressure Range MPa	0.35 ~ 0.7													
Withstanding Pressure MPa	1.0													
Recommended Air Blow Pressure MPa	0.3 ~ 0.4													
Operating Temperature Range °C	0 ~ 70													
Usable Fluid	Dry Air													

Specifications : VWM4000 / VWM5000

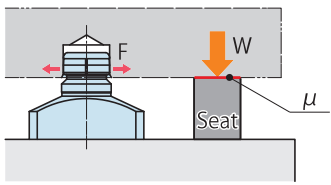
Model No.	VWM4000					VWM5000				
Workpiece Hole Diam. Code	210	220	230	240	250	260	270	280	290	300
Workpiece Hole Diam. (Standard Diam.) mm	φ21 _{H8/0} ^{+0.033}	φ22 _{H8/0} ^{+0.033}	φ23 _{H8/0} ^{+0.033}	φ24 _{H8/0} ^{+0.033}	φ25 _{H8/0} ^{+0.033}	φ26 _{H8/0} ^{+0.033}	φ27 _{H8/0} ^{+0.033}	φ28 _{H8/0} ^{+0.033}	φ29 _{H8/0} ^{+0.033}	φ30 _{H8/0} ^{+0.033}
Locating Repeatability mm	0.003									
Allowable Offset (C : Cut) mm	±0.15	±0.15	±0.15	±0.15	±0.15	±0.15	±0.15	±0.15	±0.15	±0.15
Expanding Force (F) N	at 0.35MPa	420	420	420	420	420	700	710	710	710
	at 0.5MPa	580	580	580	580	580	920	930	930	930
	at 0.7MPa	790	790	790	790	790	1210	1220	1220	1220
Allowable Thrust Load N	5500	5500	5500	5500	6500	7500	7500	7500	9000	9000
Cylinder Capacity (Empty Action) cm ³	Release side	0.62			0.86					
	Lock side	0.54			0.74					
Operating Pressure Range MPa	0.35 ~ 0.7									
Withstanding Pressure MPa	1.0									
Recommended Air Blow Pressure MPa	0.3 ~ 0.4									
Operating Temperature Range °C	0 ~ 70									
Usable Fluid	Dry Air									

Notes :

- ※1. Expanding force shows the calculated value when coefficient friction is μ0.2.
Refer to the following for the relative equation of expanding force and allowable workpiece weight for locating.
- ※2. Exceeding allowable thrust load leads to accuracy failure and/or damages on the product.
 1. This product locates with air pressure + spring and releases with air pressure. (Air Pressure Double Action)
 2. This cylinder is used only for locating and does not have a clamping function.

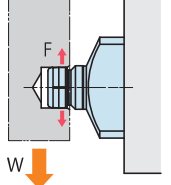
Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

Horizontal Attitude



$$\text{Workpiece Weight (W)} \leq \frac{\text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency } 0.5}{\text{Friction Coefficient of Workpiece Seat Face } (\mu)}$$

Vertical Attitude



$$\text{Workpiece Weight (W)} \leq \text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency } 0.5$$

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 VWM (Pneumatic Expansion Locating Pin).

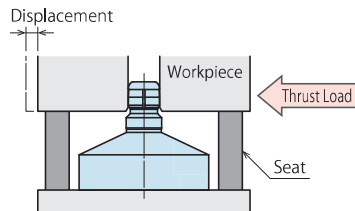
Note :

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

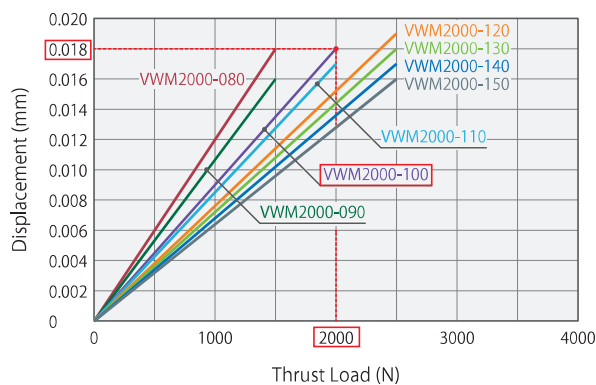
[How to Read the Thrust Load/Displacement Curve]

ex.) In case of VWM2000-100

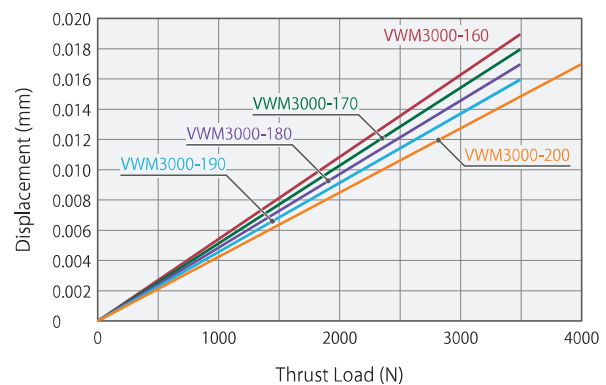
Requirement : When a 2000N thrust load is applied to an expanded VWM2000-100, the displacement will be about 0.018mm.



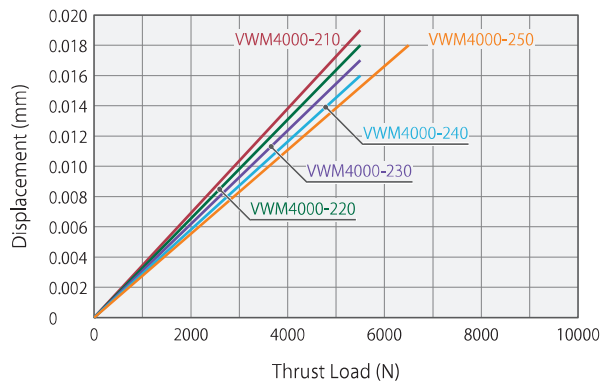
VWM2000



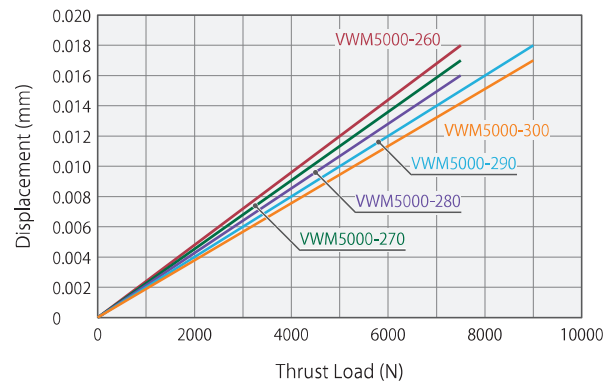
VWM3000



VWM4000



VWM5000



Locating + Clamp

Locating

Hand - Clamp

Support

Valve - Coupler

Cautions - Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VWK

Manual Expansion Locating Pin

VX

Screw Locator

VXE

VXF

Compliance Module

WRC

Expansion Locating Pin

Model **VWK**

Pneumatic • Double Action
Locating Repeatability : 10 μ m

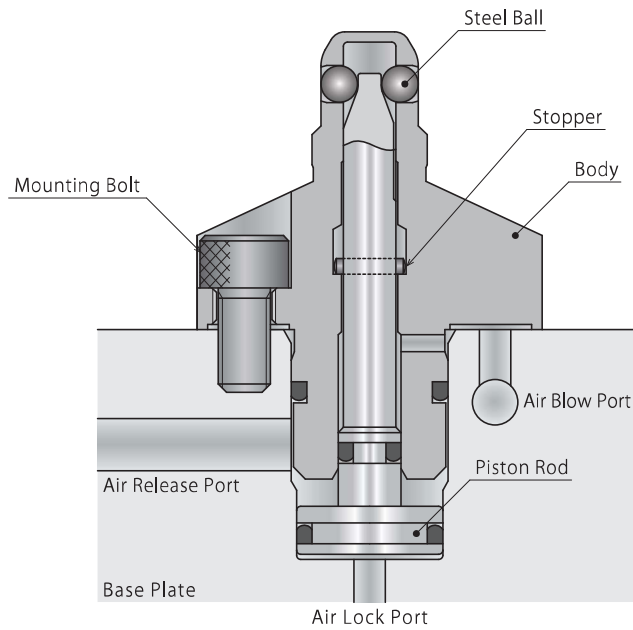


Index

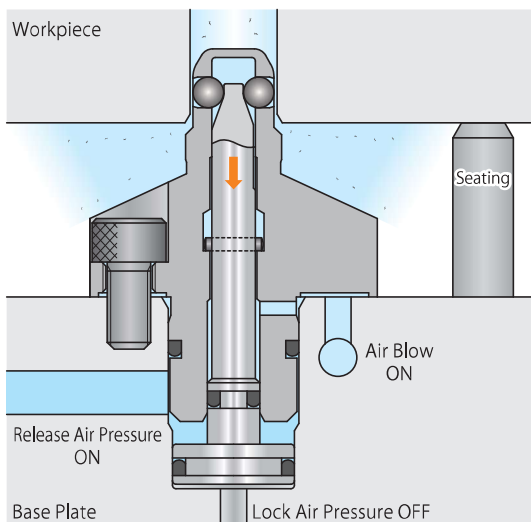
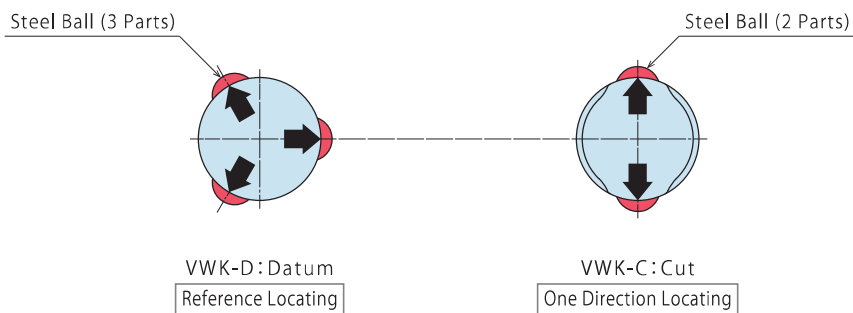
Expansion Locating Pin Digest	P.173
Application Examples	P.176
System References and Essential Points	P.177
Action Description	P.204
Model No. Indication	P.205
Specifications	P.207
External Dimensions	
• Standard	P.209
• with Seating Surface	P.213
• Release Confirmation Model	P.217
Cautions	
• Notes for Expansion Locating Pin	P.221
• Cautions (Common)	P.715
• Notes on Handling • Maintenance/Inspection • Warranty	

Action Description

This is a simplified drawing of VWK (Standard).

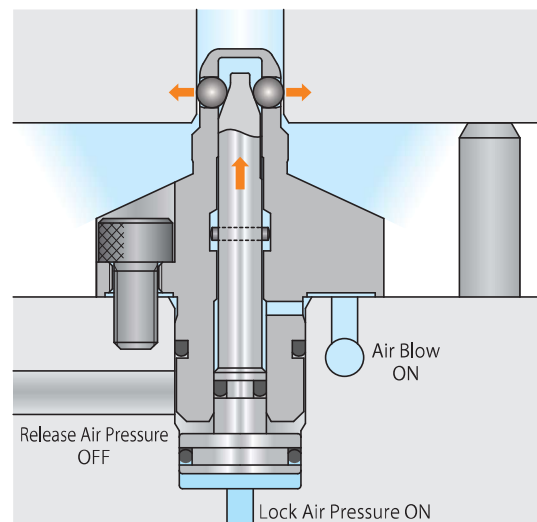


About Reference Locating and Orientation



When loading workpiece

When unloading workpiece



When locating

- When lock air pressure is OFF and release air 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 release air pressure is OFF and lock air pressure is ON, the piston rod ascends and the steel balls are expanded to locate the workpiece (Seating is required for standard and release confirmation models.)

Locating + Clamp

Locating

Hand - Clamp

Support

Valve - Coupler

Cautions - Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VWK

Manual Expansion Locating Pin

VX

Screw Locator

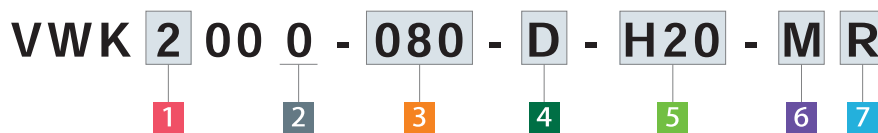
VXE

VXF

Compliance Module

WRC

Model No. Indication



1 Body Size

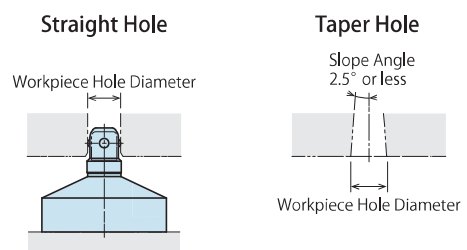
- 2 : Select from Workpiece Hole Diameter $\phi 7.6 \sim \phi 10.8$
- 3 : Select from Workpiece Hole Diameter $\phi 10.4 \sim \phi 16.2$

2 Design No.

- 0 : Revision Number

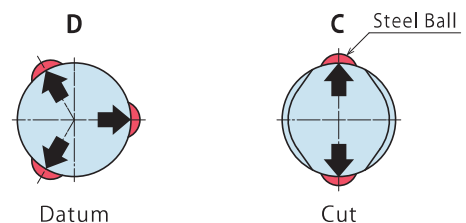
3 Workpiece Hole Diameter

Workpiece Hole Diameter Code		080	090	100	110	120	130	140	150
Workpiece Hole Diameter (mm)	Straight Hole	$\phi 7.6 \sim \phi 8.5$	$\phi 8.5 \sim \phi 9.5$	$\phi 9.5 \sim \phi 10.8$	$\phi 10.4 \sim \phi 12$	$\phi 11.4 \sim \phi 13$	$\phi 12.2 \sim \phi 14.1$	$\phi 13.2 \sim \phi 15.1$	$\phi 14 \sim \phi 16.2$
	Taper Hole	$\phi 8 \sim \phi 8.5$	$\phi 9 \sim \phi 9.5$	$\phi 10 \sim \phi 10.8$	$\phi 11 \sim \phi 12$	$\phi 12 \sim \phi 13$	$\phi 13 \sim \phi 14.1$	$\phi 14 \sim \phi 15.1$	$\phi 15 \sim \phi 16.2$
VWK2000		Selection Range							
VWK3000					Selection Range				



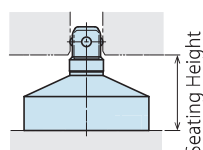
4 Functions

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



5 Seating Height Dimension

- 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

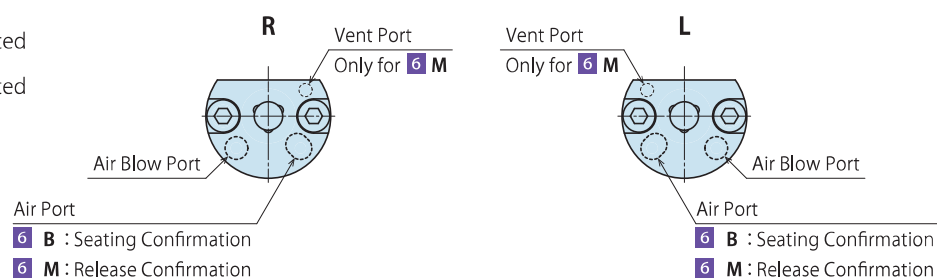
Note :

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 : VWK2000

Model No.		VWK2000-080	VWK2000-090	VWK2000-100
Workpiece Hole Diameter mm	Straight Hole	ϕ 7.6 ~ ϕ 8.5	ϕ 8.5 ~ ϕ 9.5	ϕ 9.5 ~ ϕ 10.8
	Taper Hole	ϕ 8 ~ ϕ 8.5	ϕ 9 ~ ϕ 9.5	ϕ 10 ~ ϕ 10.8
Locating Repeatability ^{※1}	mm	0.01		
Allowable Offset (C : Cut)	mm	\pm 0.4	\pm 0.4	\pm 0.5
Expanding Force (F) ^{※2} N	at 0.35MPa	70		
	at 0.5MPa	110		
	at 0.7MPa	150		
Allowable Thrust Load ^{※3}	N	450	600	800
Cylinder Capacity (Empty Action) cm ³	Release side	0.23	0.28	0.33
	Lock side	0.28	0.34	0.40
Operating Pressure Range	MPa	0.35 ~ 0.7		
Withstanding Pressure	MPa	1.0		
Recommended Air Blow Pressure	MPa	0.3 ~ 0.4		
Operating Temperature Range	°C	0 ~ 70		
Usable Fluid		Dry Air		

Specifications : VWK3000

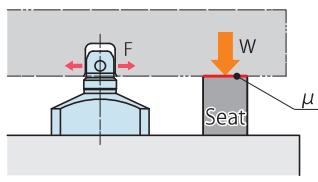
Model No.		VWK3000-110	VWK3000-120	VWK3000-130	VWK3000-140	VWK3000-150
Workpiece Hole Diameter mm	Straight Hole	ϕ 10.4 ~ ϕ 12	ϕ 11.4 ~ ϕ 13	ϕ 12.2 ~ ϕ 14.1	ϕ 13.2 ~ ϕ 15.1	ϕ 14 ~ ϕ 16.2
	Taper Hole	ϕ 11 ~ ϕ 12	ϕ 12 ~ ϕ 13	ϕ 13 ~ ϕ 14.1	ϕ 14 ~ ϕ 15.1	ϕ 15 ~ ϕ 16.2
Locating Repeatability ^{※1}	mm	0.01				
Allowable Offset (C : Cut)	mm	\pm 0.6	\pm 0.6	\pm 0.7	\pm 0.7	\pm 0.8
Expanding Force (F) ^{※2} N	at 0.35MPa	120				
	at 0.5MPa	170				
	at 0.7MPa	240				
Allowable Thrust Load ^{※3}	N	1000	1000	1300	1300	1800
Cylinder Capacity (Empty Action) cm ³	Release side	0.59	0.59	0.67	0.67	0.75
	Lock side	0.76	0.76	0.87	0.87	0.97
Operating Pressure Range	MPa	0.35 ~ 0.7				
Withstanding Pressure	MPa	1.0				
Recommended Air Blow Pressure	MPa	0.3 ~ 0.4				
Operating Temperature Range	°C	0 ~ 70				
Usable Fluid		Dry Air				

Notes :

- ※1. It shows locating repeatability under the specific condition (no load).
- ※2. Expanding force shows the calculated value when coefficient friction is μ 0.1.
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 air pressure. (Air Pressure Double Action)
 2. This cylinder is used only for locating and does not have a clamping function.

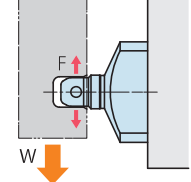
Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

Horizontal Attitude



$$\text{Workpiece Weight (W)} \leq \frac{\text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency 0.5}}{\text{Friction Coefficient of Workpiece Seat Face } (\mu)}$$

Vertical Attitude



$$\text{Workpiece Weight (W)} \leq \text{Expanding Force per Expansion Locating Pin (F)} \times \text{Efficiency 0.5}$$

Locating + Clamp

Locating

Hand · Clamp

Support

Valve · Coupler

Cautions · Others

Pneumatic Expansion Locating Pin (Smaller)

VRA/VRC

Pneumatic Expansion Locating Pin

VWH

VWM

VWK

Manual Expansion Locating Pin

VX

Screw Locator

VXE

VXF

Compliance Module

WRC