

CVM

油壓擴徑定位銷

HYDRAULIC EXPANSION LOCATING PIN



產品特性

重複定位精度 CVM: $\pm 3 \mu\text{m}$
 定位銷與工件孔之間間隙為零

最大操作壓力: 70 kgf/cm²
 最小操作壓力: 25 kgf/cm²

FEATURES

Locating Repeatability CVM: $\pm 3 \mu\text{m}$
 Zero clearance between reference hole, locating pin with high accuracy

Max.operating pressure: 70 kgf/cm²
 Min.operating pressure: 25 kgf/cm²

訂購標示法 ORDERING INDICATION

示例: CVM 12 - D - S

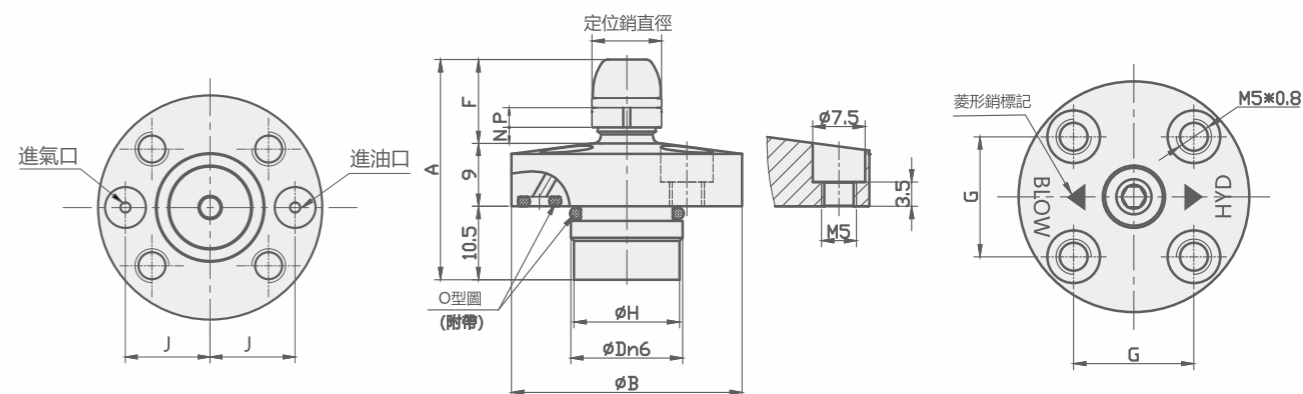
CVM	系列 Series																																			
12	工件孔徑 (標準孔徑) Workpiece Hole Diameter (Standard)	08 : $\Phi 8\text{H}8 \text{ mm}$ 09 : $\Phi 9\text{H}8 \text{ mm}$ 10 : $\Phi 10\text{H}8 \text{ mm}$ 12 : $\Phi 12\text{H}8 \text{ mm}$ 13 : $\Phi 13\text{H}8 \text{ mm}$ 15 : $\Phi 15\text{H}8 \text{ mm}$ 16 : $\Phi 16\text{H}8 \text{ mm}$ 18 : $\Phi 18\text{H}8 \text{ mm}$ 20 : $\Phi 20\text{H}8 \text{ mm}$																																		
D	功能分類 Functions	D : 錐銷 (基準定位用) C : 菱形銷 (1個方向定位用) D : Datum (for Reference Locating) C : Cut (for One Direction Locating)	錐銷 Datum 菱形套 Cut 定位方向標記 Cut Mark																																	
S	對應工件孔徑 Applicable Workpiece Hole Diameter	S : 標準徑 Standard Diameter A□□□ : 準標準徑 Substandard Diameter ※ 記載範例 ※ Example 例 1: 「CVM12-D-A125」時 工件孔徑: $\Phi 12.5\text{H}8$ 對應 CVM12-D 規格 Example 1: CVM12-D with Workpiece Hole Diameter of $\Phi 12.5\text{H}8^{+0.027}_0$ 例 2: 「CVM09-C-A093」時 工件孔徑: $\Phi 9.3\text{H}8$ 對應 CVM09-C 規格 Example 2: CVM09-C with Workpiece Hole Diameter of $\Phi 9.3\text{H}8^{+0.022}_0$ 例 3: 「CVM18-D-S」時 工件孔徑: $\Phi 18\text{H}8$ 對應 CVM18-D 規格 Example 3: CVM18-D with Workpiece Hole Diameter of $\Phi 18\text{H}8^{+0.027}_0$	<table border="1"> <thead> <tr> <th>型號 Model No.</th> <th>S : 標準徑 Standard Diameter</th> <th>A□□□準標準徑 Substandard Diameter</th> </tr> </thead> <tbody> <tr> <td>CVM08</td> <td>8H8</td> <td>8.1H8 ~ 8.8H8</td> </tr> <tr> <td>CVM09</td> <td>9H8</td> <td>8.9H8 ~ 9.9H8</td> </tr> <tr> <td>CVM10</td> <td>10H8</td> <td>10.1H8 ~ 11.3H8</td> </tr> <tr> <td>CVM12</td> <td>12H8</td> <td>11.4H8 ~ 12.7H8</td> </tr> <tr> <td>CVM13</td> <td>13H8</td> <td>12.8H8 ~ 14.2H8</td> </tr> <tr> <td>CVM15</td> <td>15H8</td> <td>14.3H8 ~ 15.7H8</td> </tr> <tr> <td>CVM16</td> <td>16H8</td> <td>15.8H8 ~ 16.9H8</td> </tr> <tr> <td>CVM18</td> <td>18H8</td> <td>17.0H8 ~ 17.9H8</td> </tr> <tr> <td>CVM18</td> <td>18H8</td> <td>18.1H8 ~ 18.4H8</td> </tr> <tr> <td>CVM20</td> <td>20H8</td> <td>18.5H8 ~ 19.9H8</td> </tr> </tbody> </table>	型號 Model No.	S : 標準徑 Standard Diameter	A□□□準標準徑 Substandard Diameter	CVM08	8H8	8.1H8 ~ 8.8H8	CVM09	9H8	8.9H8 ~ 9.9H8	CVM10	10H8	10.1H8 ~ 11.3H8	CVM12	12H8	11.4H8 ~ 12.7H8	CVM13	13H8	12.8H8 ~ 14.2H8	CVM15	15H8	14.3H8 ~ 15.7H8	CVM16	16H8	15.8H8 ~ 16.9H8	CVM18	18H8	17.0H8 ~ 17.9H8	CVM18	18H8	18.1H8 ~ 18.4H8	CVM20	20H8	18.5H8 ~ 19.9H8
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規格參數表 SPECIFICATION

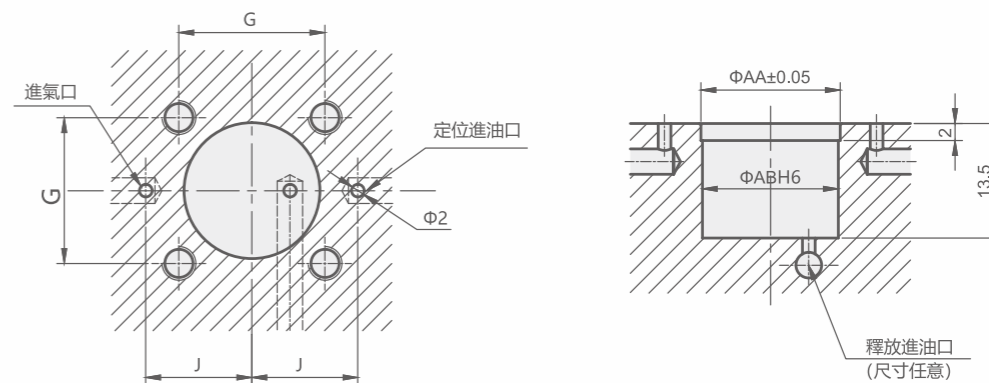
型號 MODEL	工件孔徑 Workpiece Hole Diameter		重複定位精度 Locating Repeatability	容許偏心率 (C: 菱形銷) Offset Tolerance (C:cut)	定位力*2			容許剪切載荷*3 Allowable Thrust Load	定位側油缸容積 Cylinder Capacity (Lock side)	釋放側油缸容積 Cylinder Capacity (Release Side)	最高使用壓力 Max. Operating Pressure	最低動作壓力 Min. Operating Pressure	使用溫度 Operating Temperature	重量 Weight	使用液體 Usable Fluid
	標準徑 Standard Diameter	準標準徑* Substandard Diameter	mm	mm	2.5MPa 時	5.0MPa 時	7.0MPa 時	KN	cm ³	cm ³	MPa	MPa	(°C)	(g)	
CVM08	8H8	8.1-8.8	0.003	± 0.05	260	430	510	1.5	0.05	0.06	7.0	2.5	0~70	90	相當於 ISO 黏度等級的 ISO-VG-32 一般液壓油 Recommended: ISO-VG-32 hydraulic oil equivalent to ISO viscosity grade
CVM09	9H8	8.9-9.9	0.003	± 0.05	260	430	510	1.5	0.05	0.06	7.0	2.5	0~70	90	
CVM10	10H8	10.1-11.3	0.003	± 0.10	260	430	510	2.0	0.05	0.06	7.0	2.5	0~70	90	
CVM12	12H8	11.4-12.7	0.003	± 0.10	260	430	510	2.5	0.05	0.06	7.0	2.5	0~70	95	
CVM13	13H8	12.8-14.2	0.003	± 0.10	260	430	510	2.5	0.05	0.06	7.0	2.5	0~70	95	
CVM15	15H8	14.3-15.7	0.003	± 0.10	260	430	510	2.5	0.05	0.06	7.0	2.5	0~70	100	
CVM16	16H8	15.8-16.9	0.003	± 0.15	290	470	550	3.0	0.11	0.15	7.0	2.5	0~70	115	
CVM18	18H8	17.0-18.4	0.003	± 0.15	290	470	550	3.0	0.11	0.15	7.0	2.5	0~70	120	
CVM20	20H8	18.5-19.9	0.003	± 0.15	290	470	550	3.5	0.11	0.15	7.0	2.5	0~70	125	

外形尺寸 EXTERNAL DIMENSIONS

※ 本圖所示 CVM-D 的釋放狀態 (油壓供給時)
 ※ This drawing shows the released state of CVM-C.
 (When supplying release hydraulic pressure)



安裝部位加工尺寸 MACHINING DIMENSIONS OF MOUNTING AREA



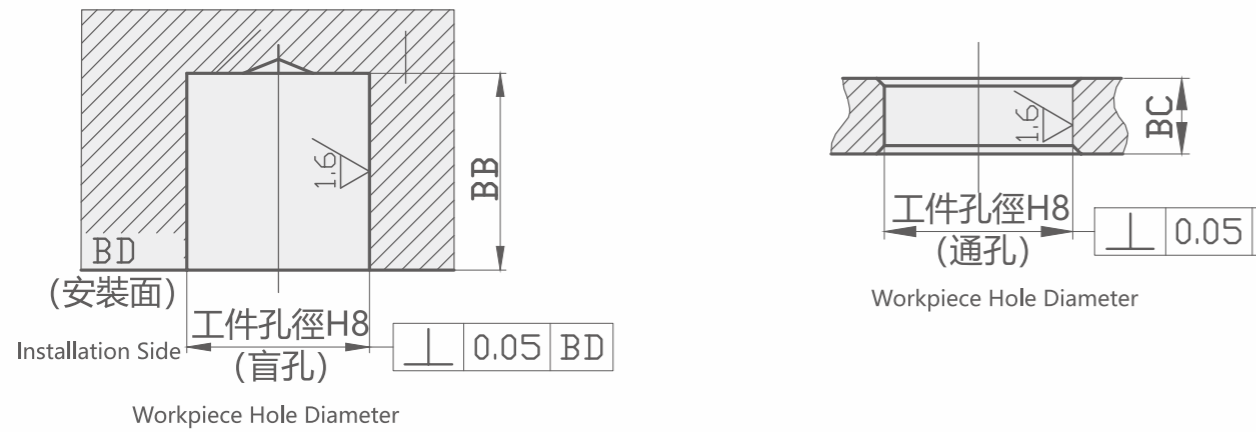
注意事項

- ※ 1. 只有 -C: 菱形銷上印有識別標記。◀▶ 是表示定位方向。
- ※ 2. M5x0.8 螺紋是在卸下定位銷時使用的。
- ※ 3. 法蘭側面刻印有供給口名稱。(HYD: 定位用供油口, BLOW: 空氣清潔用供氣口)

Notes

- ※ 1. The identification mark is only found on C: Cut. Refer to ◀▶ marking, locating direction.
- ※ 2. The M5 x 0.8 threads are used when removing the datum cylinder
- ※ 3. The port name is imprinted on the side.(HYD: Lock hydraulic port, BLOW: Air blow port)

工件 (托盤) 的加工尺寸
WORKPIECE (PALLET) MACHINING DIMENSIONS



規格參數表 SPECIFICATIONS

型號	工件孔徑		定位銷孔徑	(標準徑)	定位銷徑	(標準徑)	全行程	容許偏心量
MODEL	標準徑	標準徑 ※1	釋放時 (MAX)	全行程時 (MIN)	釋放時 (MAX)	全行程時 (MIN)	Full Stroke mm	(C: 菱形銷)
	Standard Diameter mm	Substandard Diameter*1 mm	When Releasing (MAX) mm	When Full Stroke(MIN) mm	When Releasing (MAX) mm	When Full Stroke(MIN) mm		Offset Tolerance (C.cut) mm
CVM08	8H8	8.1 ~ 8.8	7.94	8.05	工件孔徑	工件孔徑	0.6	±0.05
CVM09	9H8	8.9 ~ 9.9	8.94	9.05	Workpiece Hole Diameter - 0.06	Workpiece Hole Diameter - 0.05	0.6	±0.05
CVM10	10H8	10.1 ~ 11.3	9.94	10.05	工件孔徑	工件孔徑	0.6	±0.10
CVM12	12H8	11.4 ~ 12.7	11.92	12.05	Workpiece Hole Diameter - 0.08	Workpiece Hole Diameter - 0.05	0.7	±0.10
CVM13	13H8	12.8 ~ 14.2	12.92	13.05	工件孔徑	工件孔徑	0.7	±0.10
CVM15	15H8	14.3 ~ 15.7	14.92	15.05	Workpiece Hole Diameter - 0.08	Workpiece Hole Diameter - 0.05	0.7	±0.10
CVM16	16H8	15.8 ~ 16.9	15.89	16.08	工件孔徑	工件孔徑	1.0	±0.15
CVM18	18H8	17.0 ~ 18.4	17.89	18.08	Workpiece Hole Diameter - 0.11	Workpiece Hole Diameter - 0.08	1.0	±0.15
CVM20	20H8	18.5 ~ 19.9	19.89	20.08	工件孔徑	工件孔徑	1.0	±0.15

MODEL	A	B	D	F	G	H	J	N	P	R定位銷徑標準徑時	O形密封圈S	O形密封圈T	Y	AA	AB	AC	BB	BC
										Standard Datum Diameter	O-ring S	O-ring T						
CVM08	31.5	33	16n6	12	17.2	15.7	12.5	2.5	2.6	4.8	AS568	AS568-	6.7	16.1		16	12.5	5.5
CVM09	31.5	33	16n6	12	17.2	15.7	12.5	2.5	2.6	5.8	AS568-014(90°)	AS568-005(70°)	6.7	16.1	16H6 ^{+0.011} ₀	16	12.5	5.5
CVM10	31.5	33	16n6	12	17.2	15.7	12.5	2.3	2.8	6.8	AS568-014(90°)	AS568-005(70°)	6.7	16.1		16	12.5	5.5
CVM12	32	33	16n6	12.5	17.2	15.7	12.5	2.1	3.2	8.7	AS568	AS568-	6.5	16.1		16	13	5.5
CVM13	32	33	16n6	12.5	17.2	15.7	12.5	2.1	3.2	9.7	AS568-014(90°)	AS568-005(70°)	6.5	16.1	16H6 ^{+0.011} ₀	16	13	5.5
CVM15	32	33	16n6	12.5	17.2	15.7	12.5	2.1	3.2	11.7	AS568	AS568-	6.5	16.1		16	13	5.5
CVM16	36	37	19n6	16.5	19.6	18.7	14.5	2.7	4.5	11.3	AS568	AS568-	6.5	19.1		19	17	7.5
CVM18	36	37	19n6	16.5	19.6	18.7	14.5	2.7	4.5	13.3	AS568-014(90°)	AS568-005(70°)	6.5	19.1	16H6 ^{+0.011} ₀	19	17	7.5
CVM20	36	37	19n6	16.5	19.6	18.7	14.5	2.7	4.5	15.3	AS568	AS568-	6.5	19.1		19	17	7.5

注意事項 NOTE

設計方面的注意事項CVM通用Notes for Design CVM common

1. 確認規格

- 使用前請確認各產品的規格。
- CVM 型產品採用油壓定位，油壓釋放結構。

2. 定位銷的設置

- 定位銷是用於定位的，並不具有夾緊功能。請另行設置夾緊缸。

3. 建議將空氣清潔回路的直徑設定在 Φ6mm 以上。

4. 關於定位銷的安裝方向 (相位)

- -C: 菱形銷 (CVM) 是以 -D: 基準銷 (CVM) 為基準進行旋轉方向定位的。所以安裝時必須注意 -C(菱形銷) 的相位

CVM 時

安裝 -C(菱形銷) 時，請將 -C(菱形銷) 的定位方向標記垂直於 -D (基準銷)。(-C(菱形銷) 本體的法蘭上面印有定位方向標記: ▲。)

5. 關於 Z 軸方向的基準面

- 本型號產品無著座面 (Z 軸方向基準面)。
- 請另行設置 Z 軸方向定位的著座面。
- 並在定位銷的法蘭上面與工件 (托盤) 之間設置間隙。(推薦間隙: 0.5 ~ 1mm)

6. 關於定位銷的高度調整

- 擴徑定位銷的高度比著座面的高度低時，可以在定位銷下面設置墊塊調整定位銷的高度。

7. 工件 (托盤) 垂直姿勢 (掛壁式) 使用時

- 裝卸工件 (托盤) 時請防止工件 (托盤) 浮起或傾斜現象。如果在浮起的狀態下進行定位，就有可能導致裝置的損壞。
- 釋放時，工件 (托盤) 有可能墜落時，請在外部設置預夾裝置。
- 工件(托盤)垂直姿勢(掛壁式)使用會導致定位銷內部滑動部位的偏磨損。請定期確認定位精度，如果超出容許範圍，請立即更換裝置。

8. 關於工件 (托盤) 的重量

- 請將工件(托盤)水平姿勢(平置)使用時的工件(托盤)重量設定為

$$\text{工件重量} \leq \frac{1 \text{ 臺定位銷的定位力}}{\text{工件著座面的摩擦係數}}$$

- 請將工件(托盤)垂直姿勢(掛壁式)使用的工件(托盤)的重量設定為

$$\text{工件重量} \leq \frac{1 \text{ 臺定位銷的定位力}}{1}$$

- 如果在上記姿勢之外使用時，請另行詢問。

1. Check Specifications

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

2. Setting Up the Clamps

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

3. It is recommended to use the air flow path over Φ6mm.

4. Clamp Mounting Direction (Phase)

- The reference position (origin) is determined by CVM-D (Datum: for Reference Locating). CVM-C (Cut: for One Direction Locating) locates in one direction (Y-axis), so phasing is necessary

In the case of CVM

When you mount it, make sure the CVM-C (cut) cut mark is perpendicular to CVM-D (datum). (There is a cut mark (▲) on top of the flange on the CVM-C unit that shows the locating direction.)

5. Reference Surface towards Z-axis

- Datum cylinder has no seat face (Z axis datum face).
- Please prepare for the seat separately for proper Z axis direction positioning. Make sure there is clearance between the top of the flange on the datum cylinder and the workpiece (pallet). (Recommended clearance: 0.5 ~ 1mm)

6. Adjusting Height of Datum Cylinder

- For applications where the seat face is high and the height of datum cylinder is not enough, the height of datum cylinder is adjustable using a spacer block under the datum cylinder.

7. When the workpiece (pallet) is the vertical position.

- When the workpiece (pallet) is being set, ensure that it is in proper proximity and square to the clamps.
- As the workpiece (pallet) may fall down during releasing, it is recommended to set up the latching mechanism to prevent it from falling down.
- When the workpiece (pallet) is used a vertical position (hanging on the wall), the internal moving parts tend to wear out. confirm the positioning precision in a regular manner. In case the allowed range is exceeded, change the machine.

8. Workpiece (Pallet) Weight

- The Workpiece (Pallet) Weight Calculation - Horizontal Attitude:

$$\text{工件重量} \leq \frac{1 \text{ 臺定位銷的定位力}}{\text{工件著座面的摩擦係數}}$$

- 請將工件(托盤)垂直姿勢(掛壁式)使用的工件(托盤)的重量設定為

$$\text{工件重量} \leq \frac{1 \text{ 臺定位銷的定位力}}{1}$$

- 如果在上記姿勢之外使用時，請另行詢問。

9. 關於 Z 軸方向的傾斜

- 如果工件(托盤)在傾斜狀態下進行裝卸，定位銷的擴徑部位與工件孔產生別緊力而造成定位銷及工件(托盤)的損壞。因此在裝卸工件(托盤)時，對於定位銷的傾斜度應在 4/100 ~ 5/100(約 2 ~ 3°) 以下。
- 工件(托盤)裝卸時，在工件(托盤)傾斜的狀態下裝卸(特別是卸下)時，會導致定位銷的損壞。請設置導向銷(粗導銷)。

9. Incline in the Z-axis direction.

- If workpiece (pallet) is loaded/unloaded on tilted condition, expanded part of datum cylinder and workpiece hole can become stuck and damage the cylinder and workpiece is possible. Workpiece (pallet) should be loaded and unloaded with less than 4/100 ~ 5/100 (approx. 2~3°) of tilt between workpiece and datum cylinder plane.
- If necessary, provide guide pins to keep the pallet level during loading and unloading. Please prepare guide pin (rough guide) etc.

10. 關於工件孔周邊的壁厚

- 如果工件孔周圍存在薄壁部分，定位動作會造成工件孔變形，並導致定位力不能滿足規定值。使用前請進行夾緊試驗，將供給油壓調整至最適合的油壓狀態。

10.Thickness around the Workpiece Hole

- In case that the material thickness is thin around locating hole, expansion force may deform the hole. It may cause unsatisfied locating accuracy.Please do trial testing and adjust to proper pneumatic pressure.

安裝施工方面注意事項 NOTE

● 設計方面的注意事項CVM

1) 關於CVM定位銷安裝孔的間距精度

- 請將CVM定位銷安裝孔的間距精度保證在±0.02mm以內。容許偏心量 (-C: 菱形銷) ≥ 定位銷間距精度 + 工件孔間距精度(±0.02)。請參考下示 JIS B 0613 中心距離容許差 [2 級]。

Notes for to CVM

1) Distance Accuracy of CVM

- Distance accuracy of the CVM's mounting hole should be within±0.02mm. The distance accuracy of each workpiece hole (Pallet Hole) should be within the allowable tolerance.Please refer to below table under JIS B 0613 Class 2.

中心距離的分類 CENTER DISTANCE CLASSIFICATION		中心距離的容許差 CENTER DISTANCE ACCURACY	
大於 Greater than	小於 or less	2級 class2	
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	

1) 確認液壓油

2) 機器的安裝

- 請使用附帶的安裝螺栓 (強度等級 12.9)，並按照下表給出的緊固力矩進行安裝。為了避免設備傾斜，請均等地緊固螺栓。

1) Check the Usable Fluid

2) Mounting Cylinder

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

型號 Model No.	安裝螺栓名稱 Thread Size	緊固力矩 Tightening Torque (Nm)
CVM	M4×0.7	3.2

3) 拆卸

- 請利用頂起用螺紋，在保持設備平行的狀態下進行拆卸
- 為了防止頂起用螺紋損壞安裝用螺紋的端面，請使用平行銷對螺紋的端面採取保護措施。

4) 擴徑定位銷的油口位置

CVM: HYD 定位用供油口、BLOW: 噴氣清潔用供氣口

定位油壓是由定位用供油口實施供給。

5) 請將噴氣清潔回路外徑設定在Φ6(內徑Φ4)以上。

- 為確保噴氣清潔的效果，推薦使用外徑Φ6(內徑Φ4)以上的氣管。

3) Removing Cylinder

- Remove with torque wrench in a parallel fashion when detaching.

- Protect the screw parts with parallel pins as shared in the graph below in order for the bolts used for jack not to damage the surface of mounting screws.

4) Port Location of Datum Cylinder

CVM: HYD : Hydraulic Lock Port、BLOW : Air Blow Port
Hydraulic pressure is supposed to be supplied from lock port

5) Please use air blow circuit with outside diameter. Φ6 (inside diameterΦ4) or larger.

- To do an effective air blow, it is recommended to use air piping with outside diameter Φ6 (insidediameter Φ4) or larger.

