



## POWER CHUCKS

高速中空油壓夾頭

HIGH SPEED HOLLOW POWER CHUCKS

### 操作說明書 INSTRUCTION MANUAL

#### 重要

機械操作人員在使用夾頭前，  
請詳閱操作說明書，以確保操  
作安全。

#### Important

To ensure correct and safe operation,  
read all operating instructions  
carefully before attempting to use  
the chuck.

請詳閱手冊內容並善加保存  
Please Read And Keep This Manual.







## 警告標語

### Safety Information



#### ◎ 重要說明，請妥善保管

Please read and keep this manual for future reference.

當您在使用本項產品之前，請先詳細閱讀本文說明及注意事項，  
以確保您的安全和正確的使用，尤其特別標示之說明。

To ensure safe and correct use of this product, please read and pay close attention to the instructions.  
Keep this manual with care so that it can be easily retrieved when needed.

#### 警告標誌說明

##### Safety alert symbols and signal words



**DANGER**

**危險**

未依照此標示的說明，將產生立即的危險和重大的傷害或死亡。

Indicates an imminently hazardous situation of which, if not avoided, will result in death or serious injury.



**WARNING**

**警告**

未依照此標示的說明，將引起潛在的危險和重大的傷害或死亡。

Indicates a potentially hazardous situation of which, if not avoided, will result in death or moderate injury.



**CAUTION**

**注意**

未依照此標示的說明，將引起潛在的危險和中度的傷害或死亡。

Indicates a potentially hazardous situation of which, if not avoided, may result in minor or moderate injury.

#### 留意標誌說明

##### Important symbols and signal words

**IMPORTANT**

**留意事項**

依照此標示的說明，充分了解本產品性能，可避免因誤解而產生錯誤的操作。

Instructions for chuck performance and avoiding errors or mistakes.

1. 目錄.....	1
2. 使用注意事項.....	2~7
3. 規格說明.....	8~15
4. 檢驗	
4-1 夾持力與迴轉數的關係.....	16~19
4-2 上爪的高度， 最大靜夾持力與入力的關係..	19~20
5. 安裝	
5-1 拉桿的製作.....	21~22
5-2 製作及安裝連結盤.....	22~23
5-3 中空油壓夾頭 拉桿螺帽的加工.....	24
5-4 中空油壓夾頭的安裝步驟.....	25~26
5-5 裝配概要圖.....	27
6. 使用上的注意.....	28~30
7. 軟爪的製造成型注意事項.....	31
8. 維護及檢查.....	32~33
9. 故障排除.....	34~35

1. Contents.....	1
2. Operating precaution items.....	2~7
3. Specifications.....	8~15
4. Inspection	
4-1 The relation between the gripping force and RPM.....	16~19
4-2 The relation among the height of top jaw, the maximum static gripping force and the input force.....	19~20
5. Installation	
5-1 Manufacture of the draw bar.....	21~22
5-2 The manufacture and installation of the mounting plate.....	22~23
5-3 Manufacture of the draw nut of the hollow power chuck.....	24
5-4 The installation procedure of the hollow power chuck.....	25~26
5-5 Assembly drawing.....	27
6. Precautions.....	28~30
7. Precautions for manufacture of the soft jaws.....	31
8. Maintenance and inspection.....	32~33
9. Troubleshooting.....	34~35

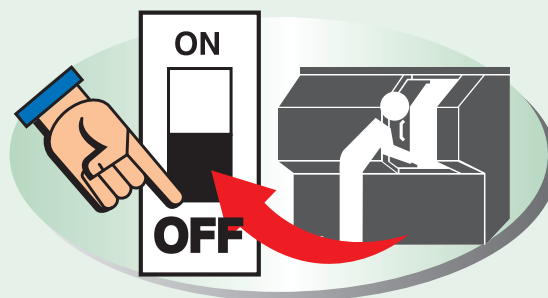


在安裝、檢查或潤滑時，勿開啓電源，確保操作者安全。

Always disconnect the machine from power source before installation, inspection or lubrication of chuck.

電源未關閉  
易發生人員身體傷害  
及衣服被捲入的危險。

Danger of being caught  
inside a machine.

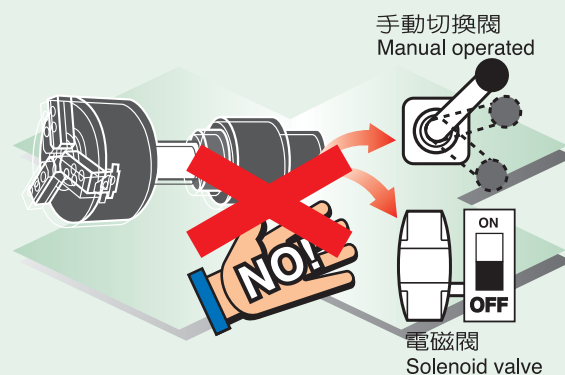


主軸旋轉當中，勿操作手動切換閥或電磁閥。

Do not operate the manual switch valve or electronic valve when the spindle rotating.

易造成  
夾持力喪失，  
工作物鬆脫飛散的危險。

Grip force will be lost and the workpiece  
will fly out of the chuck.

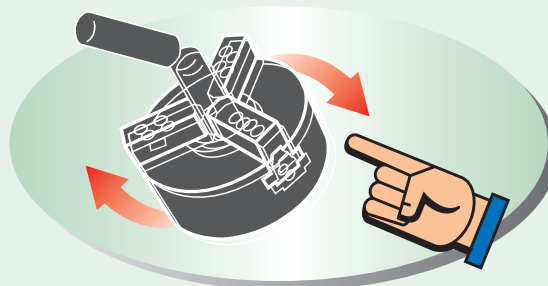


夾頭的最高迴轉速有一定的限制。（參照第八～十三頁）

The maximum RPM of the chuck is restricted. (ref. to page 8 ~ 13)

迴轉速過高產生的離心力  
會使夾持力減少，  
導致工件飛散的危險。

The centrifugal force induced by too much speed  
will reduce gripping force, causing the workpiece to  
fly out of the chuck.





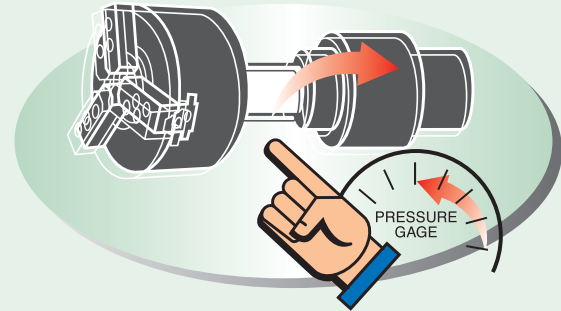


拉桿的最大推力有一定的限制。(參照第八～十三頁)

The maximum pull force of draw bar is restricted. (ref. to page 8 ~ 13)

拉桿推力過大  
將使夾頭零件損壞，  
導致工件飛散的危險。

Too much input force by the draw tube will  
damage the chuck, causing the workpiece  
to fly out of the chuck.

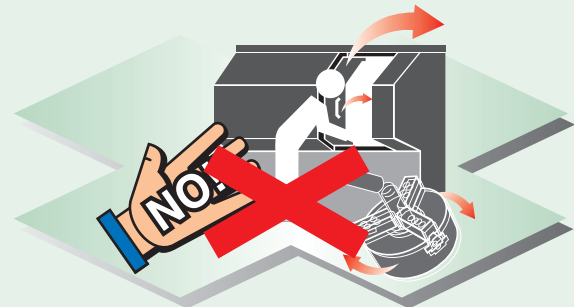


機械門打開時，不能啟動主軸旋轉。

Do not activate the rotation of spindle when door opened.

易造成  
工件或鐵屑  
飛散的危險。

The workpieces and  
metal pieces will scatter.

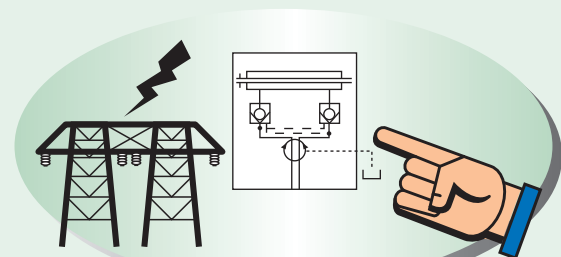


油壓迴轉缸的內藏式止逆閥，可防止停電迴轉缸喪失動力。

The built-in lock/relief valve in the cylinder can prevent losing hydraulic pressure when power is interrupted.

迴轉缸內如無此裝置  
應注意外接止逆閥，  
否則停電易造成工件飛散的危險。

The lock/relief valve should be installed if  
there is no such device in the cylinder,  
otherwise, the danger of scattering workpieces  
can be caused when power is interrupted.



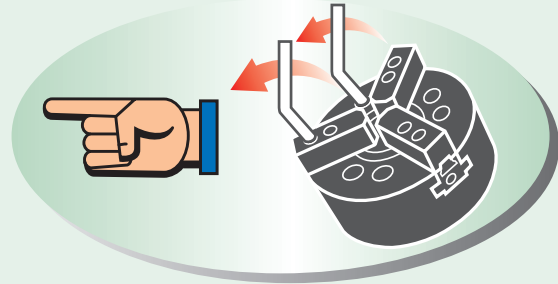


連結螺絲需依照標準扭矩鎖緊。(參照第二十三頁)

Screw all the mounting bolts with specified torque ( see page 23 )

過緊或太鬆易造成螺絲或零件  
的破損及鬆脫，工件有飛散的危險。

Improper tightening will cause  
workpiece to fly out due to  
broken or loosen bolts.

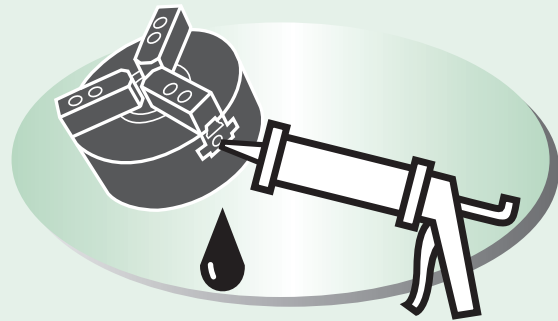


養成確實給油的習慣。(正確使用夾頭潤滑油或二硫化鉬潤滑油脂)

Be sure to lubricate the chuck. (use the chuck grease or molysulfide grease properly)

給油不足  
夾持力會降低  
造成工件飛散的危險。

Insufficient grease will reduce the grip force,  
increasing the danger of the workpiece flying  
from the chuck.

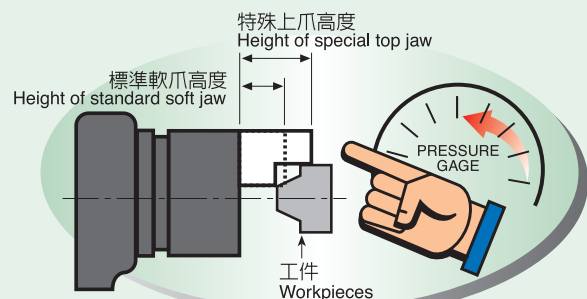


使用加高的軟爪油壓壓力有一定的限制。(參照第二十頁)

The hydraulic pressure is restricted for using the height-increased jaw. ( see page 20 )

壓力過高  
會造成夾頭損壞，  
導致工件飛散的危險。

Too much pressure will damage the chuck,  
increasing the danger of the workpiece  
flying from the chuck.





作內徑夾持時應將油壓壓力降低至正常的 50%。

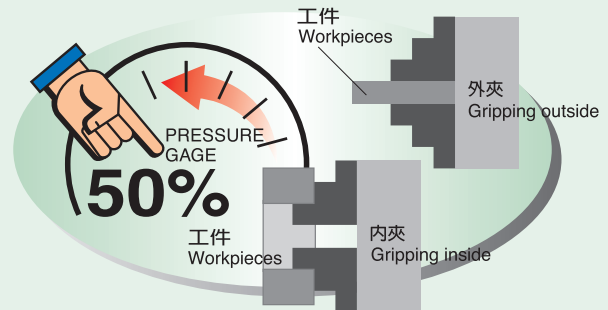
When gripping the ID of a part, reduce the hydraulic pressure by 50%

壓力如未降低

工件會因夾持力加離心力

雙重作用變形損壞。

If the pressure is not reduced, the components will be damaged due to the effects of gripping force and centrifugal force.



長條型工件或突出夾爪太長需使用止振器及尾座支撐。

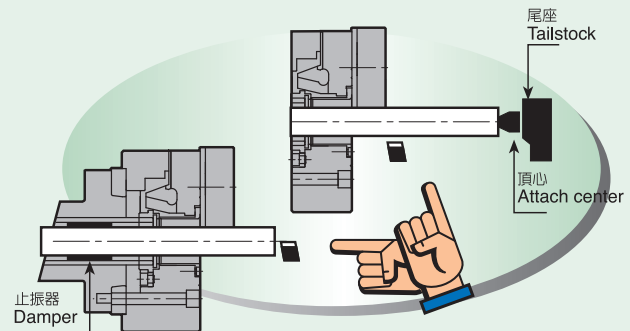
When machining a long workpiece, a tailstock and damper should be used.

如未作

適當的支撐

工件有飛散的危險。

If the workpiece is not properly supported, it can fly out of the chuck.



不當改造會損壞夾頭功能發生危險。

Un-authorized modification of the chuck could cause it to fail and will void the warranty.

不可隨意的改造夾頭

會造成危險。

Do not modify the chuck.







操作機器勿喝酒或服用麻醉藥物。

Do not operate the machine under the influence of alcohol or drugs.

酒醉或精神散亂  
易造成人員的傷害。

Reckless or negligent  
operation will cause accident  
or injury.



操作機器勿穿戴領帶或手套。

Do not wear loose clothing, neckties, gloves.

領帶或手套  
容易被機器捲入  
造成人員傷害。

Loose clothing can be caught in the moving parts  
of the chuck, causing injury or death.



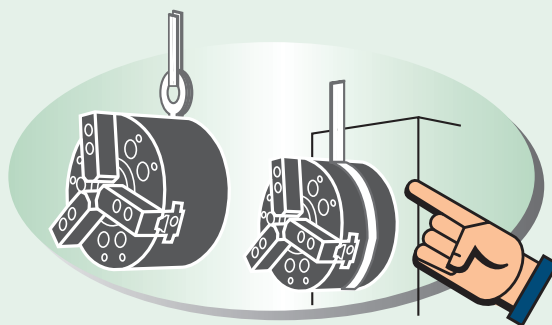


拆裝夾頭時應使用吊環或吊帶。

A hanger or lifting belt should be used to lift the chuck.

未使用  
吊環或吊帶  
可能發生掉落的危險。

Dropping the chuck can cause damage.



夾持工件時應避免手指被夾到。

Always keep your hand out of the clamping area.

一時的疏忽  
手指有被夾斷的危險。

If your fingers are caught in the chuck, they can be severed.



無論是夾頭或工件，均不可捶打或敲擊。

Do not hammer chuck or clamped workpiece.

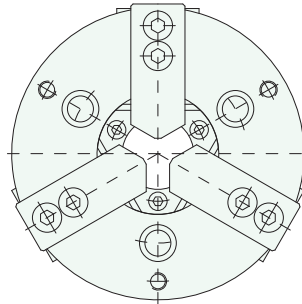
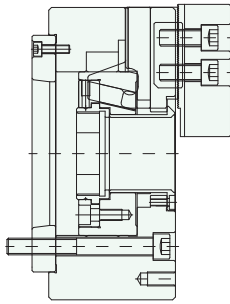
任意敲打夾頭或工件  
將影響精度損害夾頭功能。

Hammering will cause poor accuracy or poor chucking functions.

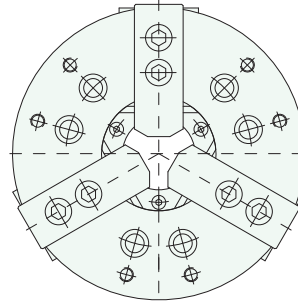


### 三爪高速中空油壓夾頭

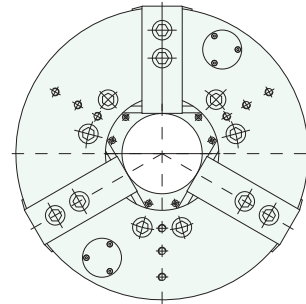
### 3-JAW HIGH SPEED HOLLOW POWER CHUCKS



BPC-204,205 型



BPC-206,208,210,212 型



BPC-215,218,221,224 型

### 規格表 (Specifications) :

型 式 Model	204 (一)	205 A <sub>2</sub> 4	206 A <sub>2</sub> 5	208 A <sub>2</sub> 6	210 A <sub>2</sub> 8	212 A <sub>2</sub> 8	215 A <sub>2</sub> 11	218 A <sub>2</sub> 11
柱塞行程 Plunger stroke mm	10	10	12	16	19	23	23	23
爪行程（直徑） Jaw stroke (diameter) mm	5.4	5.4	5.5	7.4	8.8	10.6	10.6	10.6
容許最大拉力 KN Max. pull force (kgf)	14 (1428)	17 (1730)	21 (2140)	33 (3360)	42 (4280)	54 (5500)	70 (7140)	70 (7140)
最大靜夾持力 KN Max. gripping force (kgf)	28 (2850)	35 (3570)	56 (5710)	82 (8360)	108 (11010)	141 (14380)	179 (18250)	179 (18250)
容許最大油壓壓力 Mpa Max. hydr. pressure (kgf/cm <sup>2</sup> )	2.3 (23.5)	2.8 (29)	2.7 (28)	2.5 (26)	2.6 (27)	2.6 (27)	2.4 (24.5)	2.4 (24.5)
容許最高迴轉速 Max. speed (r.p.m.)min <sup>-1</sup>	8000	7000	6000	5000	4200	3300	2500	2000
通孔直徑 Thru-hole (diameter) mm	26	33	45	52	75	91	117.5	120
標準軟爪高度 Standard soft jaw height mm	23	30	36	38	42	50	62	62
夾持範圍 Gripping range mm	ø7 ø110	ø10 ø135	ø13 ø169	ø13 ø210	ø30 ø254	ø35 ø304	ø35 ø381	ø40 ø450
質量（含標準軟爪） Weight (with standard soft jaws ) kg	3.8	6.1	12.5	21.9	33.7	55.3	106.8	152
搭配油壓缸 Matching cylinder	BC0928	BC1036	BC1246 F1246S	BC1552 F1552S	BC1875 F1875S	BC2091	BC2511	BC2511

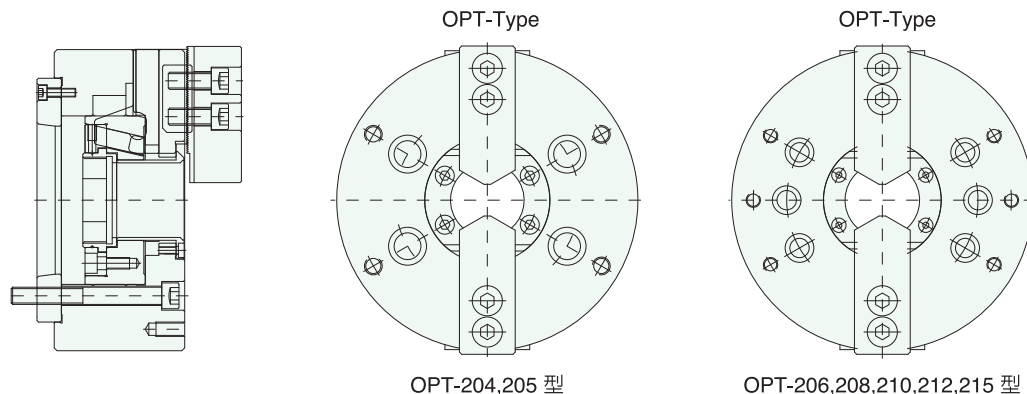
型 式 Model	221 A <sub>2</sub> 15	224 A <sub>2</sub> 20	206L A <sub>2</sub> 5	208L A <sub>2</sub> 6	210 L A <sub>2</sub> 8	210BH A <sub>2</sub> 8	212BH A <sub>2</sub> 8
柱塞行程 Plunger stroke mm	23	26	15	22	25	19.5	21
爪行程（直徑） Jaw stroke (diameter) mm	10.6	12	10.8	16	18	9	10
容許最大拉力 KN Max. pull force (kgf)	89 (9080)	89 (9080)	21 (2140)	33 (3360)	42 (4280)	42 (4280)	54 (5500)
最大靜夾持力 KN Max. gripping force (kgf)	233 (23760)	233 (23760)	40 (4080)	58 (5910)	74 (7540)	108 (11010)	141 (14380)
容許最大油壓壓力 Mpa Max. hydr. pressure (kgf/cm <sup>2</sup> )	3.0 (31.5)	3.0 (31.5)	2.7 (28)	2.5 (26)	2.6 (27)	2.6 (27)	2.7 (28)
容許最高迴轉速 Max. speed (r.p.m.)min <sup>-1</sup>	1700	1400	4300	3500	3000	4200	3300
通孔直徑 Thru-hole (diameter) mm	180	205	45	52	75	78	93
標準軟爪高度 Standard soft jaw height mm	70	70	36	38	42	42	50
夾持範圍 Gripping range mm	ø115 ø530	ø140 ø610	ø20 ø173	ø25 ø215	ø40 ø256	ø30 ø254	ø35 ø304
質量（含標準軟爪） Weight (with standard soft jaws ) kg	195.2	269.4		27		36.7	57.4
搭配油壓缸 Matching cylinder	BC 2816	BC 2816	BC1246 F1246S	BC1552 F1552S	BC1875 F1875S	BC1878	BC2093

1KN = 101.97kgf    1Mpa = 10.197kgf/cm<sup>2</sup>



### 二爪高速中空油壓夾頭

### 2-JAW HIGH SPEED HOLLOW POWER CHUCKS



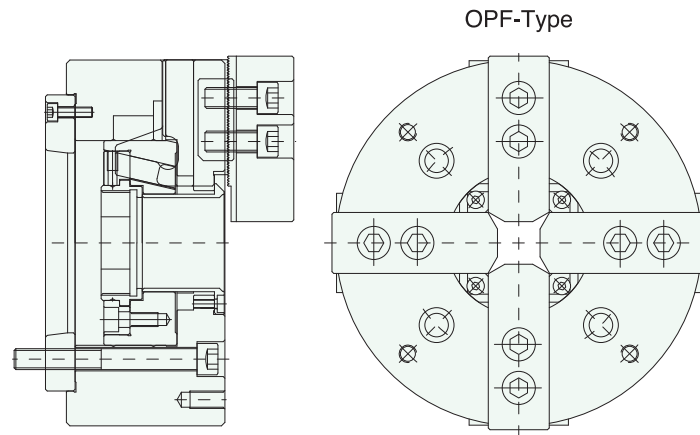
### 規格表 (Specifications) :

型 式 Model	OPT-204 (一)	OPT-205 A <sub>2</sub> 4	OPT-206 A <sub>2</sub> 5	OPT-208 A <sub>2</sub> 6	OPT-210 A <sub>2</sub> 8
柱塞行程 Plunger stroke mm	10	10	12	16	19
爪行程 (直徑) Jaw stroke (diameter) mm	5.4	5.4	5.5	7.4	8.8
容許最大拉力 KN Max. pull force (kgf)	9 (920)	11 (1120)	14 (1420)	22 (2240)	28 (2850)
最大靜夾持力 KN Max. gripping force (kgf)	19 (1930)	23 (2340)	37 (3770)	56 (5710)	73 (7440)
容許最大油壓壓力 Mpa Max. hydr. pressure (kgf/cm <sup>2</sup> )	1.5 (15.5)	1.9 (19)	1.8 (18.5)	1.7 (17)	1.8 (18)
容許最高迴轉速 Max. speed (r.p.m.)min <sup>-1</sup>	8000	7000	6000	5000	4200
通孔直徑 Thru-hole (diameter) mm	26	33	45	52	75
標準軟爪高度 Standard soft jaw height mm	23	30	36	38	42
夾持範圍 Gripping range mm	ø7 ø110	ø10 ø135	ø13 ø169	ø13 ø210	ø30 ø254
質量 (含標準軟爪) Weight (with standard soft jaws) kg	3.6	6.5	13.1	23.0	35.9
搭配油壓缸 Matching cylinder	0928	1036	1246 F1246S	1552 F1552S	1875 F1875S
型 式 Model	OPT-212 A <sub>2</sub> 8	OPT-215 A <sub>2</sub> 11	OPT-206L A <sub>2</sub> 5	OPT-208L A <sub>2</sub> 6	OPT-210L A <sub>2</sub> 8
柱塞行程 Plunger stroke mm	23	23	15	22	25
爪行程 (直徑) Jaw stroke (diameter) mm	10.6	10.6	10.8	16	18
容許最大拉力 KN Max. pull force (kgf)	36 (3670)	47 (4790)	14 (1420)	22 (2240)	28 (2850)
最大靜夾持力 KN Max. gripping force (kgf)	95 (9690)	119 (12130)	26 (2650)	38 (3870)	49 (4990)
容許最大油壓壓力 Mpa Max. hydr. pressure (kgf/cm <sup>2</sup> )	1.8 (18)	1.7 (17)	1.8 (18.5)	1.7 (17)	1.8 (18)
容許最高迴轉速 Max. speed (r.p.m.)min <sup>-1</sup>	3300	2500	4300	3500	3000
通孔直徑 Thru-hole (diameter) mm	91	117.5	45	52	75
標準軟爪高度 Standard soft jaw height mm	50	62	36	38	42
夾持範圍 Gripping range mm	ø35 ø304	ø35 ø381	ø20 ø173	ø25 ø215	ø40 ø256
質量 (含標準軟爪) Weight (with standard soft jaws) kg	56.5	103.2		26.4	
搭配油壓缸 Matching cylinder	2091	2511	1246 F1246S	1552 F1552S	1875 F1875S

1KN = 101.97kgf    1Mpa = 10.197kgf/cm<sup>2</sup>

### 四爪高速中空油壓夾頭

### 4-JAW HIGH SPEED HOLLOW POWER CHUCKS



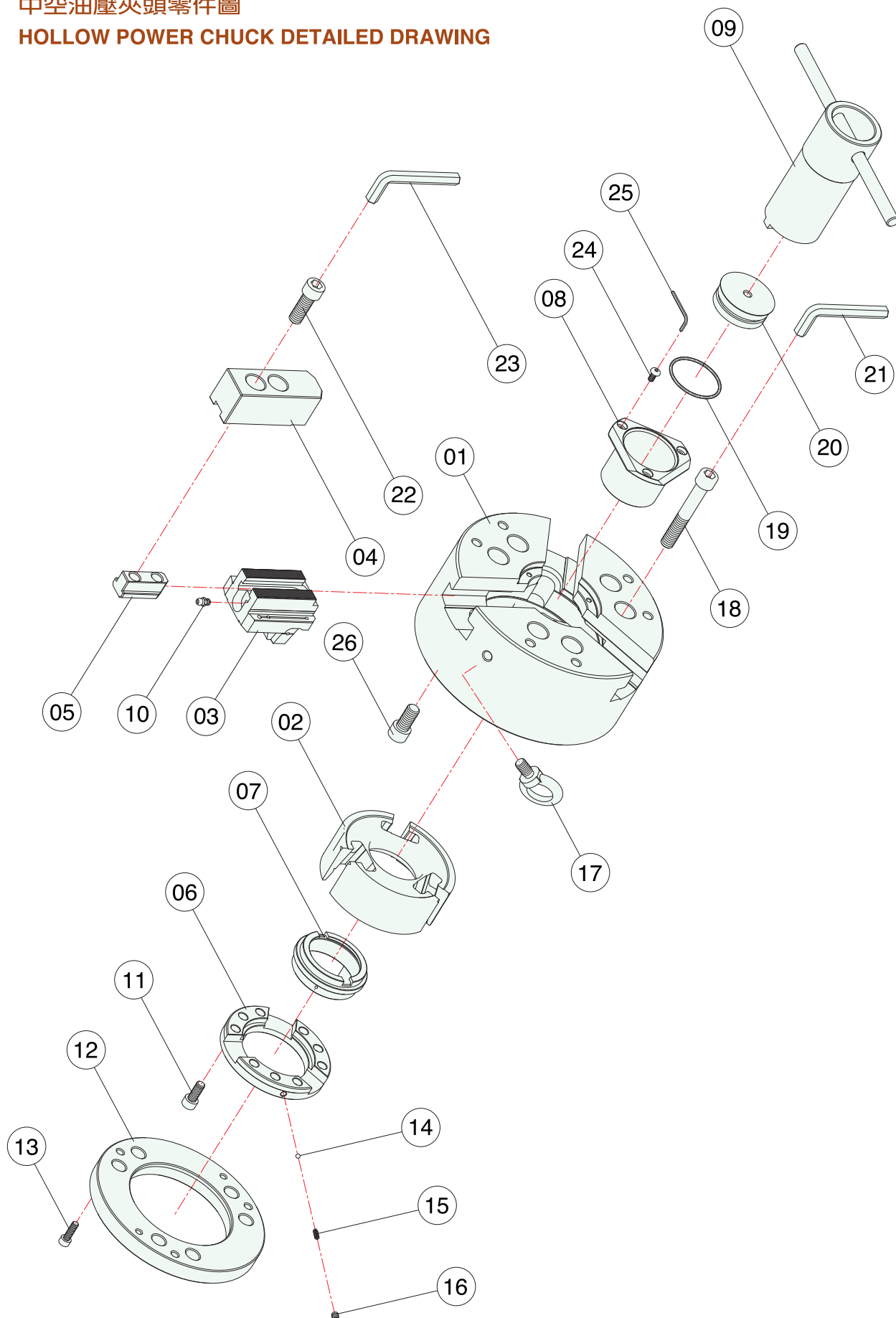
### 規格表 (Specifications) :

型 式 Model	OPF-206 A <sub>2</sub> 5	OPF-208 A <sub>2</sub> 6	OPF-210 A <sub>2</sub> 8	OPF-212 A <sub>2</sub> 8	OPF-215 A <sub>2</sub> 11
柱塞行程 Plunger stroke mm	12	16	19	23	23
爪行程 (直徑) Jaw stroke (diameter) mm	5.5	7.4	8.8	10.6	10.6
容許最大拉力 KN Max. pull force (kgf)	16 (1630)	24 (2440)	31 (3160)	40 (4080)	53 (5400)
最大靜夾持力 KN Max. gripping force (kgf)	41 (4180)	59 (6010)	79 (8050)	102 (10400)	134 (13600)
容許最大油壓壓力 Mpa Max. hydr. pressure (kgf/cm <sup>2</sup> )	2.1 (21)	1.9 (19)	2.0 (20)	2.0 (20)	1.9 (19)
容許最高迴轉速 Max. speed (r.p.m.)min <sup>-1</sup>	4500	3600	3200	2500	1800
通孔直徑 Thru-hole (diameter) mm	45	52	75	91	117.5
標準軟爪高度 Standard soft jaw height mm	36	38	42	50	62
夾持範圍 Gripping range mm	ø22 ø169	ø25 ø210	ø28 ø254	ø35 ø304	ø63 ø381
質量 (含標準軟爪) Weight (with standard soft jaws) kg	14.2	24.5	38.1	60.5	111.5
搭配油壓缸 Matching cylinder	1246	1552	1875	2091	2511

1KN = 101.97kgf    1Mpa = 10.197kgf/cm<sup>2</sup>

### 中空油壓夾頭零件圖

### HOLLOW POWER CHUCK DETAILED DRAWING





### 中空油壓夾頭零件表 (Hollow Power Chuck Parts list)

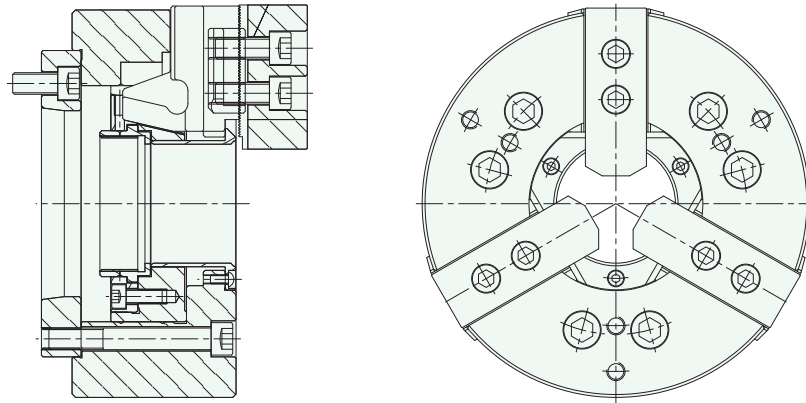
NO.	名稱	Name of parts	BPC Type 3 Jaw				
			204 205	206,208 206L,208L	Q ' ty		
					210,212 210L	215 218	221 224
1	爪殼	Body	1	1	1	1	1
2	拉盤	Wedge plunger	1	1	1	1	1
3	基爪	Master jaw	3	3	3	3	3
4	生爪 (軟爪)	Soft jaw	3	3	3	3	3
5	T 型螺帽 (T型塊)	T-nut	3	3	3	3	3
6	後固定蓋	Plunger nut	1	1	1	1	1
7	拉桿螺帽	Draw nut	1	1	1	1	1
8	防塵蓋	Cover	1	1	1	1	1
9	套筒板手 (附件)	Joint handle (accessory)	1	1	1	1	1
10	油嘴	Grease nipple	3	3	3	3	3
11	後固定蓋螺絲	Hexagon socket head cap screw	6	9	9	9	9
12	連結盤	Mounting Plate	1	1	1	1	1
13	連結盤螺絲	Hexagon socket head cap screw	3	3	3	3	3
14	鋼珠	Steel ball	1	1	1	1	1
15	彈簧	Spring	1	1	1	1	1
16	沉頭螺絲	Hexagon socket headless set screw	1	1	1	1	1
17	吊環螺絲 (附件)	Sling bolt (accessory)	-	-	1	1	1
18	夾頭連結螺絲	Chuck mounting bolt (accessory)	3	6	6	6	6
19	O 型環 (附件)	O-ring (accessory)	1	1	1	1	1
20	防水蓋 (附件)	Water proof cover (accessory)	1	1	1	1	1
21	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1	1	1
22	生爪螺絲	Jaw mounting bolt	6	6	6	6	6
23	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1	1	1
24	防塵蓋螺絲	Hexagon socket head cap screw	3	3	3	6	6
25	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1	1	1
26	基爪固定螺絲	Hexagon socket head cap screw	-	-	-	-	3

NO.	名稱	Name of parts	Q ' ty				
			OPT-204 OPT-205	OPT-206,208,210 OPT-212,215 OPT-206L,208L,210L	OPT-206, 208, 210 OPF-212, 215	OP-210BH OP-212BH	
1	爪殼	Body	1	1	1	1	
2	拉盤	Wedge plunger	1	1	1	1	
3	基爪	Master jaw	2	2	4	3	
4	生爪 (軟爪)	Soft jaw	2	2	4	3	
5	T 型螺帽 (T型塊)	T-nut	2	2	4	3	
6	後固定蓋	Plunger nut	1	1	1	1	
7	拉桿螺帽	Draw nut	1	1	1	1	
8	防塵蓋	Cover	1	1	1	1	
9	套筒板手 (附件)	Joint handle (accessory)	1	1	1	1	
10	油嘴	Grease nipple	2	2	4	3	
11	後固定蓋螺絲	Hexagon socket head cap screw	6	8	8	9	
12	連結盤	Mounting Plate	1	1	1	1	
13	連結盤螺絲	Hexagon socket head cap screw	3	3	4	3	
14	鋼珠	Steel ball	1	1	1	1	
15	彈簧	Spring	1	1	1	1	
16	沉頭螺絲	Hexagon socket headless set screw	1	1	1	1	
17	吊環螺絲 (附件)	Sling bolt (accessory)	-	1	1	1	
18	夾頭連結螺絲	Chuck mounting bolt (accessory)	4	6	4	6	
19	O 型環 (附件)	O-ring (accessory)	1	1	1	1	
20	防水蓋 (附件)	Water proof cover (accessory)	1	1	1	1	
21	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1	1	
22	生爪螺絲	Jaw mounting bolt	4	4	8	6	
23	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1	1	
24	防塵蓋螺絲	Hexagon socket head cap screw	4	4	4	3	
25	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1	1	

註：吊環螺絲為 10" 以上規格之附件      Note: Sling bolt is standard supplied for 10" or more.

### 大孔徑三爪高速中空油壓夾頭

### LARGE THROUGH HOLE 3-JAW HIGH SPEED HOLLOW POWER CHUCKS



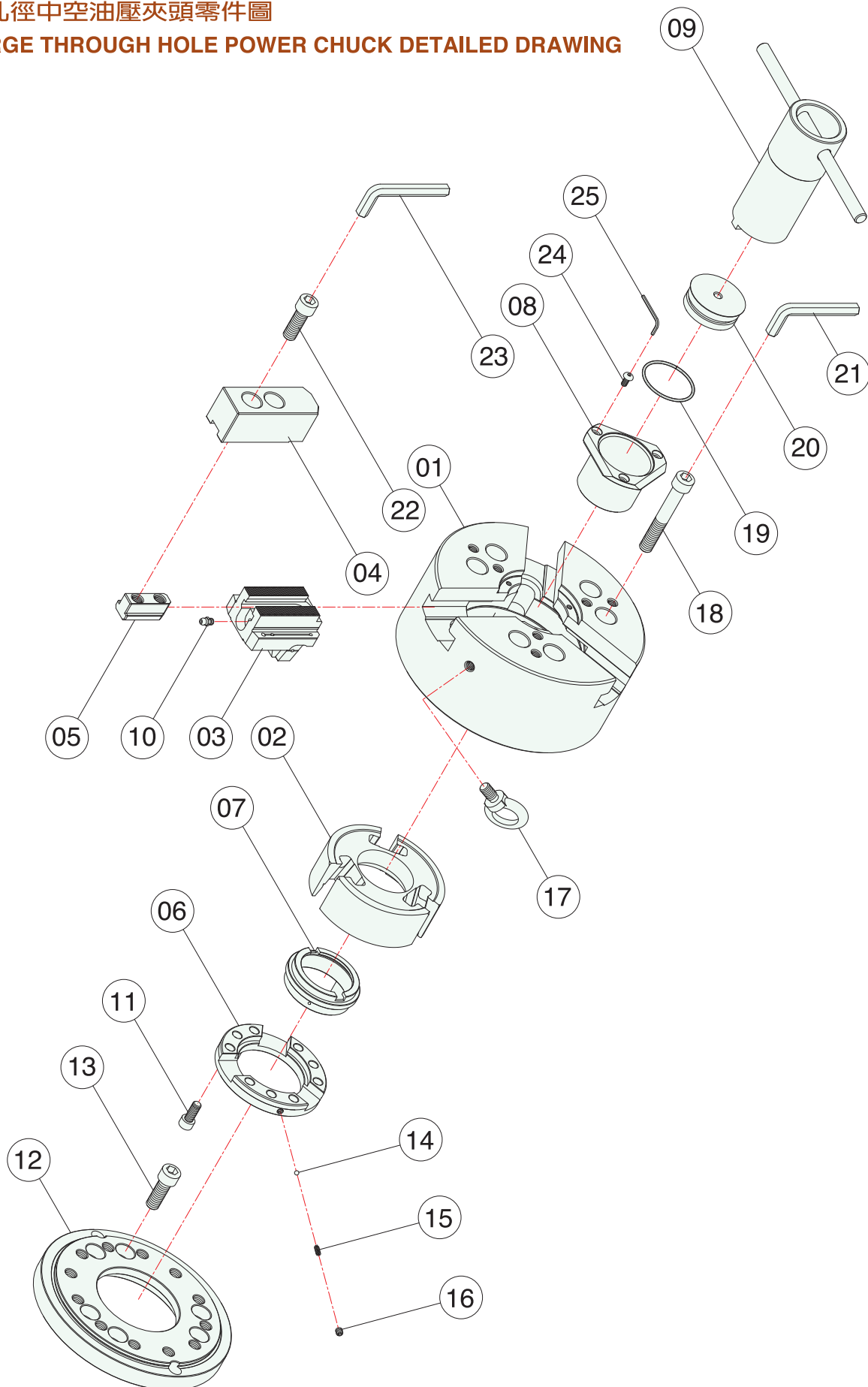
### 規格表 (Specifications) :

型 式 Model	OPB-206 A <sub>2</sub> 5	OPB-208 A <sub>2</sub> 6	OPB-210 A <sub>2</sub> 8	OPB-212 A <sub>2</sub> 8	OPB-218 A <sub>2</sub> 11
柱塞行程 Plunger stroke mm	12	16	19	23.7	24.5
爪行程 (直徑) Jaw stroke (diameter) mm	5.5	7.4	8.8	10.6	11.3
容許最大拉力 KN Max. pull force (kgf)	21.5 (2200)	33 (3400)	42 (4300)	55 (5600)	71 (7240)
最大靜夾持力 KN Max. gripping force (kgf)	58 (5900)	86 (8800)	109 (11100)	143 (14580)	179 (18250)
容許最大油壓壓力 Mpa Max. hydr. pressure (kgf/cm <sup>2</sup> )	2.0 (21)	2.5 (26)	2.8 (29)	1.8 (18)	2.3 (23)
容許最高迴轉速 Max. speed (r.p.m.)min <sup>-1</sup>	6000	5000	4200	3400	2000
通孔直徑 Thru-hole (diameter) mm	52	66	81	106	166.5
標準軟爪高度 Standard soft jaw height mm	36	38	42	50	62
夾持範圍 Gripping range mm	ø13   ø170	ø47   ø215	ø34   ø254	ø50   ø315	ø80   ø455
質量 (含標準軟爪) Weight (with standard soft jaws) kg	12.3	21.7	33.6	54.7	165
搭配油壓缸 Matching cylinder	P1452S	P1666S	P1881S	P2511	P2816

1KN = 101.97kgf    1Mpa = 10.197kgf/cm<sup>2</sup>

大孔徑中空油壓夾頭零件圖

LARGE THROUGH HOLE POWER CHUCK DETAILED DRAWING



### 大孔徑中空油壓夾頭零件表 (Large Through Hole Power Chuck Parts list)

NO.	名稱	Name of parts	OPB-206 OPB-208	Q ' ty	
				OPB-210 OPB-212	OPB-218
1	爪殼	Body	1	1	1
2	拉盤	Wedge plunger	1	1	1
3	基爪	Master jaw	3	3	3
4	生爪 (軟爪)	Soft jaw	3	3	3
5	T 型螺帽 (T型塊)	T-nut	3	3	3
6	後固定蓋	Plunger nut	1	1	1
7	拉桿螺帽	Draw nut	1	1	1
8	防塵蓋	Cover	1	1	1
9	套筒板手 (附件)	Joint handle (accessory)	1	1	1
10	油嘴	Grease nipple	3	3	3
11	後固定蓋螺絲	Hexagon socket head cap screw	9	9	9
12	連結盤	Mounting Plate	1	1	1
13	連結盤螺絲	Hexagon socket head cap screw	6	6	6
14	鋼珠	Steel ball	1	1	1
15	彈簧	Spring	1	1	1
16	沉頭螺絲	Hexagon socket headless set screw	1	1	1
17	吊環螺絲 (附件)	Sling bolt (accessory)	-	1	1
18	夾頭連結螺絲	Chuck mounting bolt (accessory)	6	6	6
19	O 型環 (附件)	O-ring (accessory)	1	1	1
20	防水蓋 (附件)	Water proof cover (accessory)	1	1	1
21	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1
22	生爪螺絲	Jaw mounting bolt	6	6	6
23	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1
24	防塵蓋螺絲	Hexagon socket head cap screw	3	3	6
25	六角板手 (附件)	Hexagon pin spanner (accessory)	1	1	1

註：吊環螺絲為 10" 以上規格之附件      Note: Sling bolt is standard supplied for 10" or more.

### 4-1 夾持力與迴轉數的關係

#### The relation between the gripping force and RPM

##### 一・最大靜夾持力

夾持力會隨著使用油的種類，上爪的高度和其他情況有所不同。我們在規格表中所列的標準值是基於下列的情況：

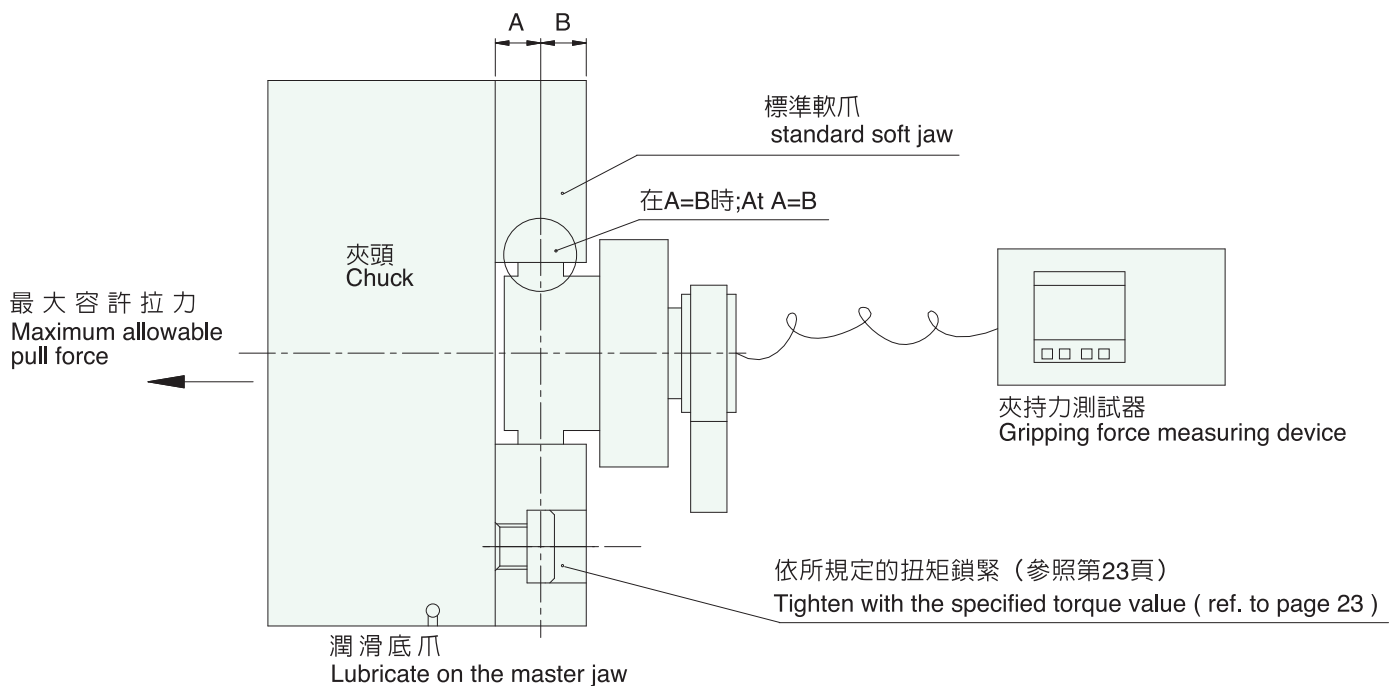
- (1) 使用標準的軟爪，而測量夾持力時使用夾持力測試計放置於軟爪高度的中間位置。  
〈參照 Fig-1 〉
- ※(2) 使用夾頭潤滑油或二硫化鋁潤滑油。
- (3) 安裝上爪時，螺絲之鎖緊扭矩，必須依照標準扭矩鎖緊。〈參照第 23 頁〉
- (4) 本表中所列之容許拉力即是拉盤的最大容許拉力。
- (5) 使用幫浦時油壓流出量至少要有 20L/min，油壓壓力之控制必需由幫浦的控制器或減壓閥分開控制。

##### 一・Maximum static gripping force

The gripping force will vary with the condition of lubrication, the type of the grease, the height of the top jaw and the other factors. The standard values listed in our specification are based on following conditions:

- (1) The gripping force measuring device is placed at the mid position of the soft jaw height. (ref. to fig-1)
- ※(2) The chuck grease or molysulfide grease should be used for chuck lubrication.
- (3) The torque value of screws should follow the specification to install the top jaw. (ref. to page 23)
- (4) The allowable pull force listed in the above table is the maximum allowable pull force of the wedge plunger.
- (5) When pump is operating, the flow rate of the hydraulic oil should be no less than 20 L/min, the pressure of the hydraulic oil should be controlled by the controlled of the pump or a reduction valve separately.

Fig. 1





### 二・最高迴轉數

夾頭最高迴轉數的取定標準是：當動態夾持力（迴轉中的夾持力）降至靜態夾持力之  $1/3$  倍實際測量值。夾持力..... 最大靜態夾持力。

上爪 ..... 標準軟爪。

底爪 ..... 爪總行程的一半。

上爪的位置 .... 爪的後端對齊夾頭的外緣。

### 二・Maximum RPM

The maximum rpm of the chuck is measured under the following condition: when the measured dynamic gripping force (the gripping force during rotation) is reduced to  $1/3$  of static gripping force.

Gripping force.....maximum static gripping force.

Top jaw.....standard soft jaw.

Master jaw.....mid position of stroke.

Position of top jaw.....the rear end of the jaw align to the profile of the chuck.



### CAUTION 注意

- 關於夾持力
  1. 在決定切削條件之前，請先參考第 16 頁到第 20 頁的資料
  2. 夾持力功能的好壞和幫浦、減壓閥、管路情況和潤滑油的差異都有關係，特大型的油壓迴轉缸因油壓壓力過大時，會傷害零件的壽命，建議使用節流閥降低突發的壓力。
- Reference of the gripping force
  1. Refer to the information from pages 13 to 18 before determining the cutting condition.
  2. The gripping force will vary based on the condition of the hydraulic pump, the reduction valves, the piping, and the type and quality of the grease used. If the hydraulic pressure is too high, the service life of the parts will be reduced, therefore it is recommended to use a regulator to control the surge pressure.

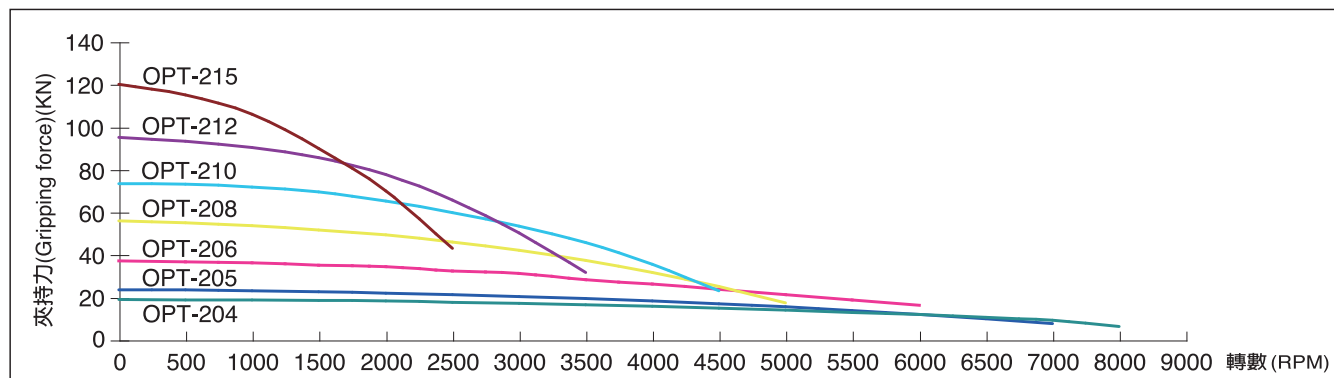
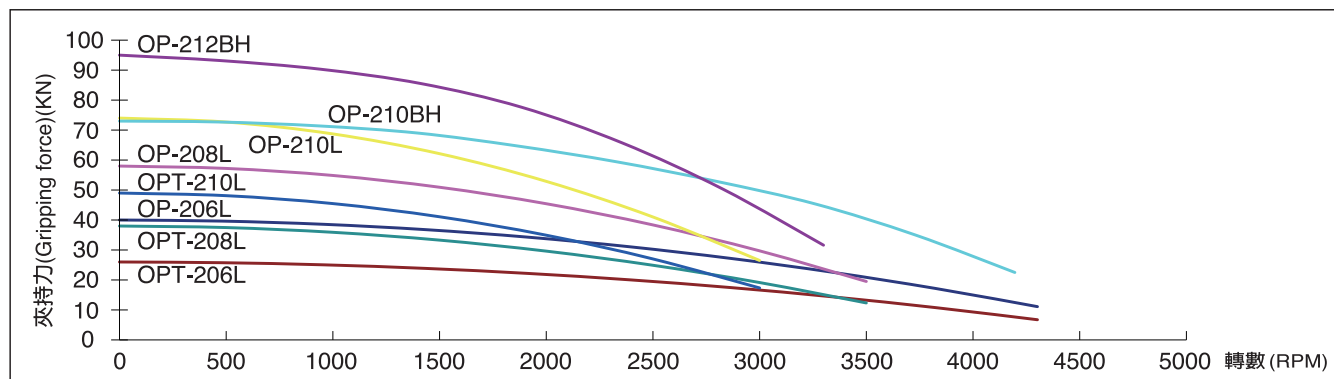
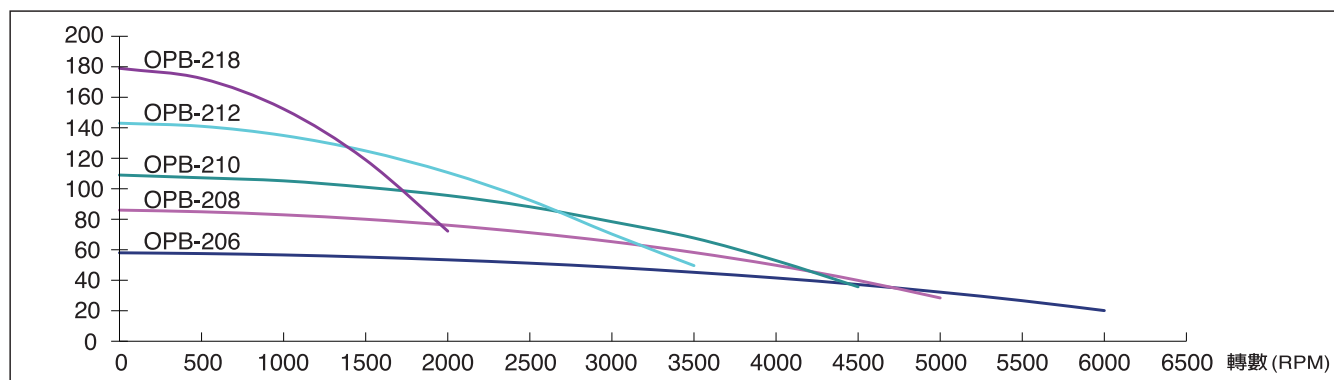
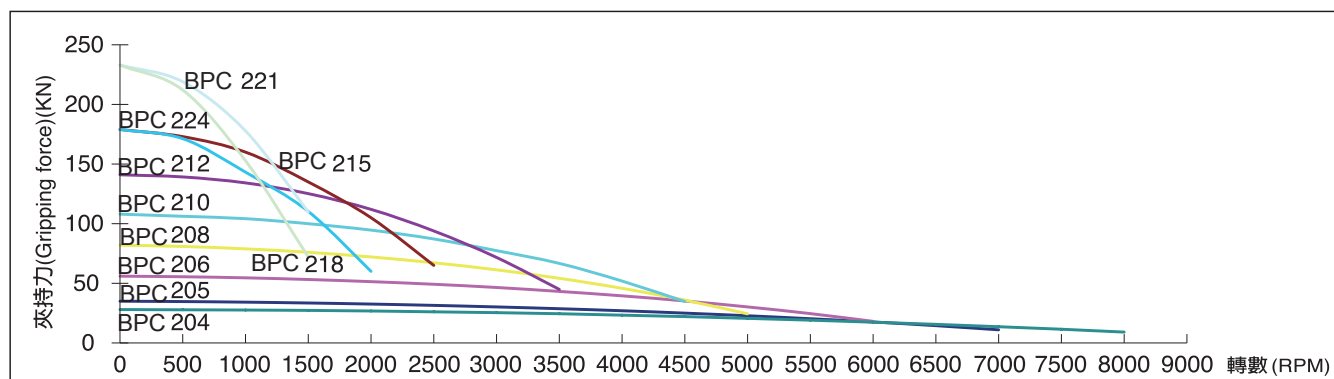


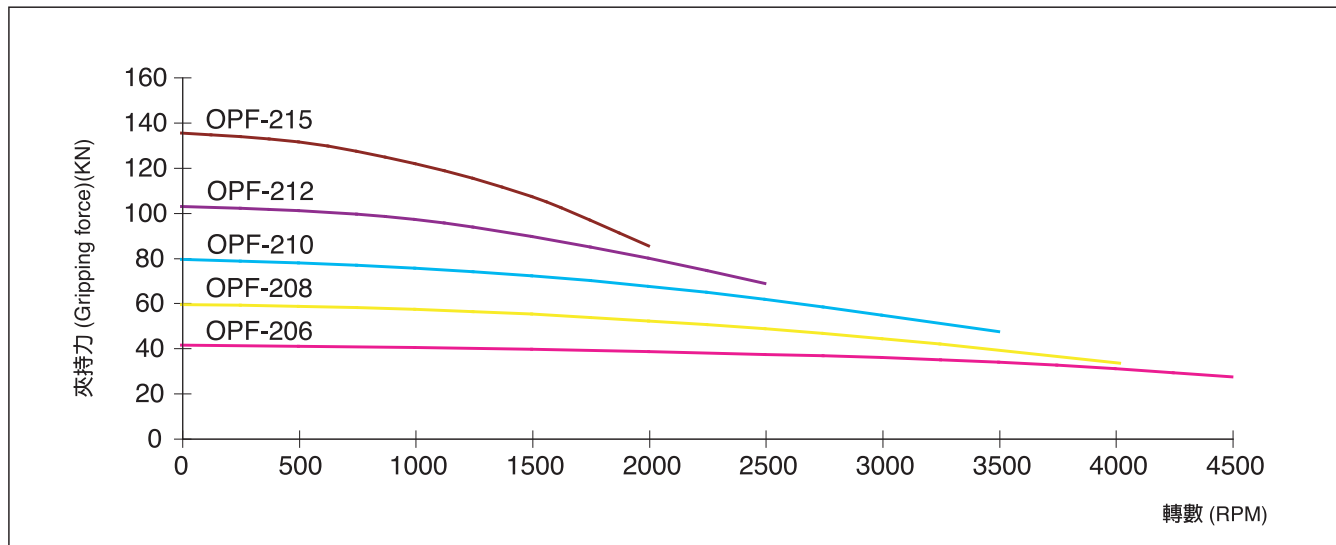
### WARNING 警告

- 使用高速迴轉注意事項
  1. 在某些工作條件下，夾持力特低，應考慮到離心力使夾持力降低，工件有脫落飛散的危險。
  2. 在重切削的場合，工件容易脫落應特別注意。
  3. 迴轉的速度必須是夾頭或油壓缸容許最高迴轉數以內。
- Precautions for operating at high RPM
  1. Under some working conditions, the gripping force is so low that there is a danger of the workpiece flying out of the chuck. Centrifugal force should be taken into consideration when operating at various RPMs and you should not exceed the recommended max RPM.
  2. Under heavy cutting conditions, be careful of the workpiece flying out of the chuck.
  3. The RPM should be no greater than the maximum specified for the chuck or cylinder.

迴轉速的增加，將使夾爪離心力變大，造成夾持力減少，下列圖形中的曲線是用標準的軟爪所測定，但另外的變數如上爪的尺寸、外形及安裝的位置，如果將使用超過最大轉速時必須再使用夾持力測試計來測試。

The higher the RPM, the higher the centrifugal force. This creates a reduction in grip force. The curves shown in the following diagrams are measured using a standard soft jaw that comes with the chuck. The gripping force will vary based on the size, shape, and position of the soft jaw. If the operation exceeds the maximum RPM for the chuck, the gripping force should be measured with a grip force measuring device.





## 4-2 上爪的高度，最大靜夾持力與入力的關係

The relation among the height of top jaw, the maximum static gripping force and the input force.



WARNING

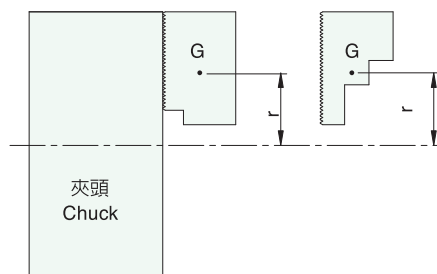
警告

當上爪的高度比標準軟爪高或上爪以前端夾持工件時必須降低油壓缸推力與上爪的高度成反比。如果沒有降低油壓缸推力可能導致夾頭破裂工件飛散的危險。

When the height of the top jaw is higher than that of the supplied soft jaw or the workpiece being clamped in the nose of the top jaw, the input force of the cylinder should be inverse in ratio to the height of the top jaw. If the input force is not reduced, the workpiece could fly out of the chuck, or the chuck could be damaged.

大型或是重的上爪在旋轉時產生較大的離心力致使夾持力劇降，因此在使用此種上爪前應考慮切削條件再做決定。

Larger or heavier top jaws will induce a higher centrifugal force during rotation. This condition can dramatically reduce the gripping force. Be sure to determine the cutting condition before using this type of top jaw.

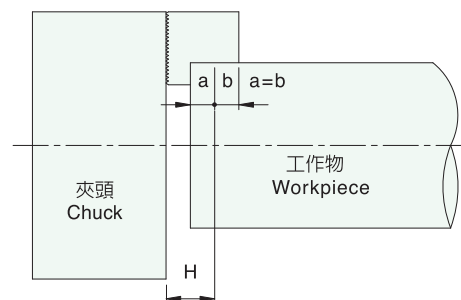


G:上爪質量中心

r:上爪質量中心至夾頭中心距離(mm)

m:上爪質量(kg)

H:上爪夾持中心高度

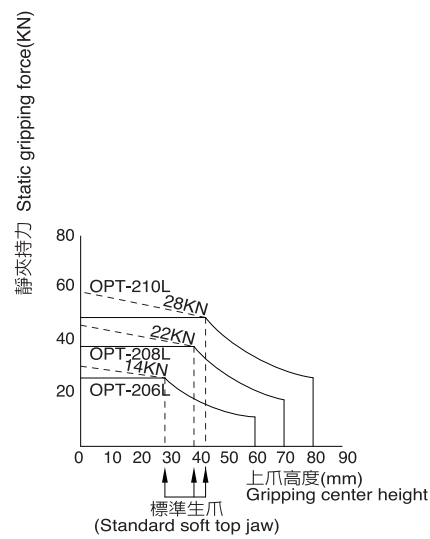
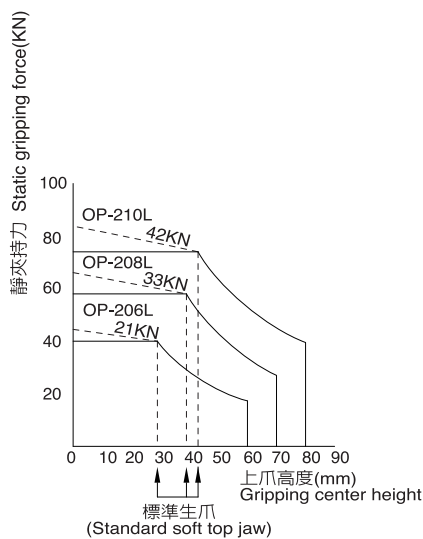
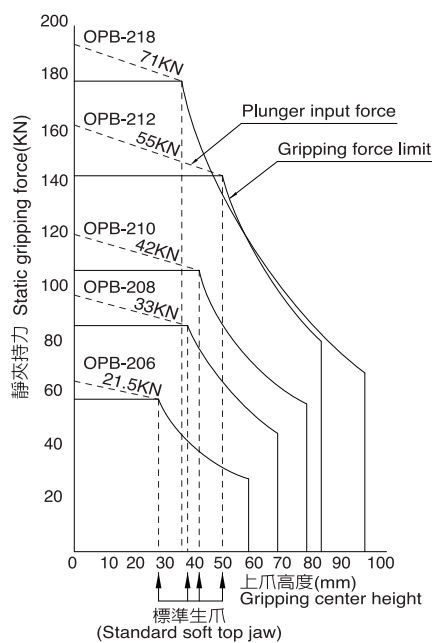
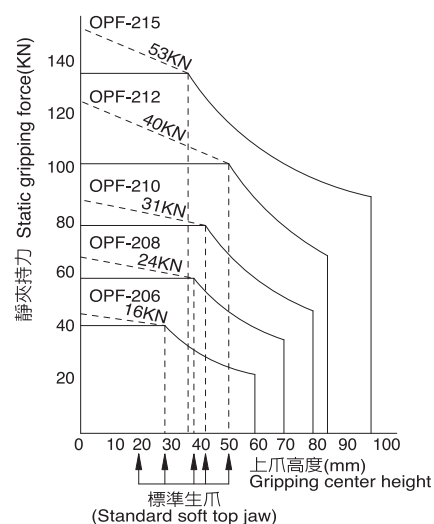
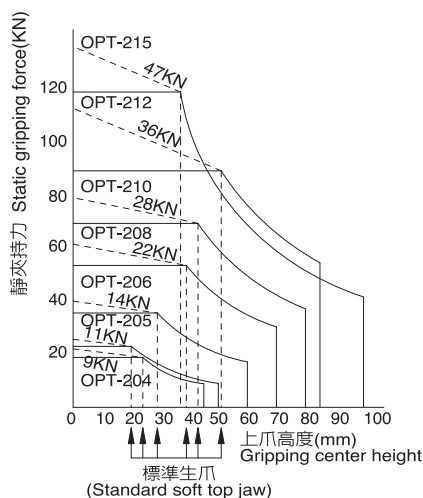
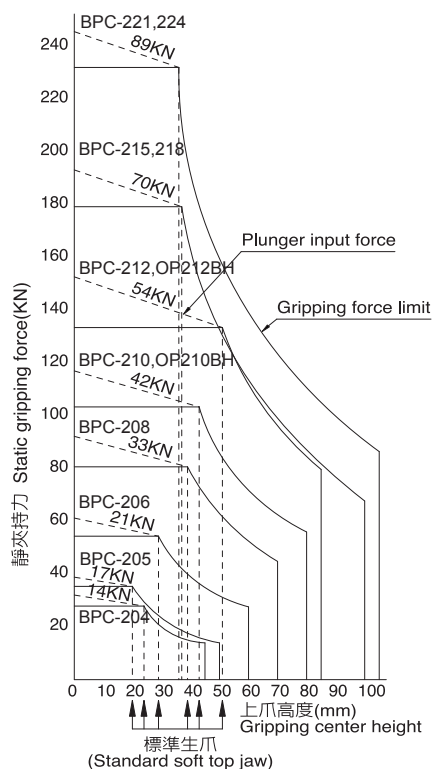


G:Center of gravity of the top jaw

r:The distance between C.g. of the top jaw and the chuck center (mm)

m:Mass of the top jaw

H:Height of the gripping force center



## WARNING 警告

- 迴轉速和油壓缸推力的選擇如上圖所示提供條件參考，但於決定的同時應試行切削一遍確認後再做
- 2 爪的推力要低於 3 爪推力的 2/3 以下
- 內徑夾持時應把推力減少至 1/2 以下
- 3 爪的夾頭若僅使用 1 爪或 2 爪時其推力必須剩 1/3 或 2/3

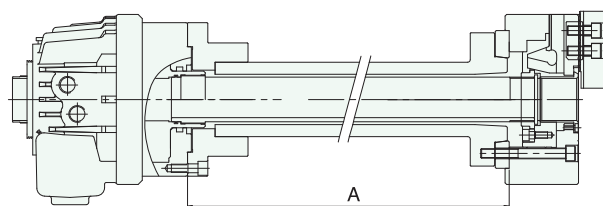
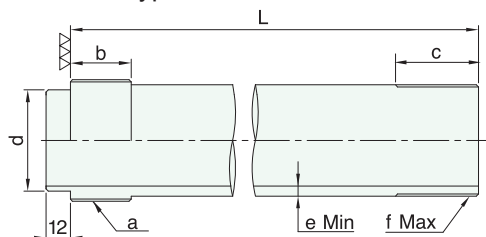
- The selection of the RPM and input force of the cylinder should be determined by referring to the above diagrams. A trial cut should be performed to confirm.
- The input force of the 2-jaw should be lower than 2/3 of the input force of a 3-jaw chuck.
- The input force should be reduced to less than 50% when clamping the ID of a workpiece.
- The input force should be reduced to 1/3 or 2/3 respectively when using only 1 or 2 jaws on the 3-jaw chuck.

## 5-1 拉桿的製作

### Manufacture of the draw bar

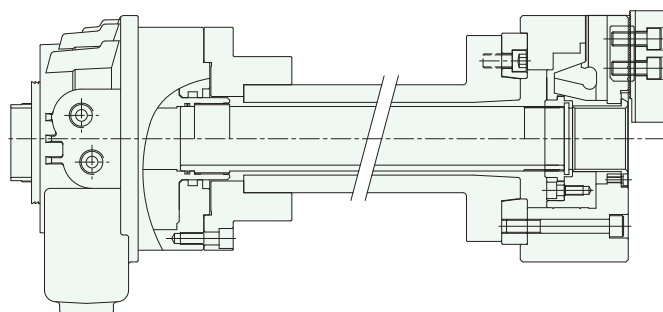
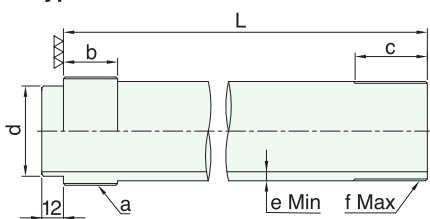
拉桿的長度請依下列計算 The length of the draw bar should be determined by following calculation.

#### Open Center Type



型式 Model	油壓缸規格 Hydraulic cylinder	a	b	c	d(f7)	e Min	f Max	L
BPC204,OPT-204	BC0928	M38 x 1.5P	25	25	34 <sup>-0.025</sup> <sub>-0.050</sub>	3	M32 x 1.5P	A+28
BPC205,OPT205	BC1036	M42 x 1.5P	25	25	38 <sup>-0.025</sup> <sub>-0.050</sub>	3.5	M40 x 1.5P	A+28
BPC206,OPT206,OPF206	BC1246/F1246S	M55 x 2P	30	25	50 <sup>-0.025</sup> <sub>-0.050</sub>	5	M55 x 2P	A+41
BPC208,OPT208,OPF208	BC1552/F1552S	M60 x 2P	30	25	55 <sup>-0.030</sup> <sub>-0.060</sub>	4	M60 x 2P	A+39
BPC210,OPT210,OPF210	BC1875/F1875S	M85 x 2P	35	30	80 <sup>-0.030</sup> <sub>-0.060</sub>	5	M85 x 2P	A+38.5
BPC212,OPT212,OPF212	BC2091	M100 x 2P	35	35	95 <sup>-0.036</sup> <sub>-0.071</sub>	4.5	M100 x 2P	A+36
BPC215,OPT215,OPF215	BC2511	M130 x 2P	45	50	125 <sup>-0.043</sup> <sub>-0.084</sub>	6.5	M130 x 2P	A+59.5
BPC218	BC2511	M130 x 2P	45	50	125 <sup>-0.043</sup> <sub>-0.084</sub>	6.5	M130 x 2P	A+59.5
BPC221	BC2816	M180 x 3P	45	50	171.5 <sup>-0.043</sup> <sub>-0.084</sub>	7.5	M195 x 2P	A+62.5
BPC224	BC2816	M180 x 3P	45	50	171.5 <sup>-0.043</sup> <sub>-0.084</sub>	7.5	M220 x 3P	A+65.5
OP-206L,OPT-206L	BC1246/F1246S	M55 x 2P	30	25	50 <sup>-0.025</sup> <sub>-0.050</sub>	5	M55 x 2P	A+41
OP-208L,OPT-208L	BC1552/F1552S	M60 x 2P	30	25	55 <sup>-0.030</sup> <sub>-0.060</sub>	4	M60 x 2P	A+39
OP-210L,OPT-210L	BC1875/F1875S	M85 x 2P	35	30	80 <sup>-0.030</sup> <sub>-0.060</sub>	5	M85 x 2P	A+38.5
OP-210BH	BC1878	M87 x 2P	35	30	83 <sup>-0.030</sup> <sub>-0.060</sub>	4.5	M87 x 2P	A+38.5
OP-212BH	BC2093	M103 x 2P	35	35	100 <sup>-0.036</sup> <sub>-0.071</sub>	5	M103 x 2P	A+34.5

#### OPB-Type



型式 Model	油壓缸規格 Hydraulic cylinder	a	b	c	d(f7)	e Min	f Max	L
OPB-206	P1452S	M60 x 2P	30	25	55 <sup>-0.025</sup> <sub>-0.050</sub>	4	M60 x 2P	A+34
OPB-208	P1666S	M75 x 2P	35	30	70 <sup>-0.030</sup> <sub>-0.060</sub>	4.5	M75 x 2P	A+42
OPB-210	P1881S	M87 x 2P	35	30	85 <sup>-0.030</sup> <sub>-0.060</sub>	4.5	M90 x 2P	A+37.5
OPB-212	BC2511	M130 x 2P	45	35	125 <sup>-0.043</sup> <sub>-0.084</sub>	4.5	M115 x 2P	A+46.5
OPB-218	BC2816	M180 x 3P	45	50	171.5 <sup>-0.043</sup> <sub>-0.084</sub>	4	M180 x 3P	A+58.5



#### WARNING

#### 警告

- 拉桿厚度增加方能有足夠之強度。若拉桿之強度不足會使其斷裂而喪失夾持力，同時工件飛出，產生危險。

The drawpipe must be thick enough to hold up to the speed and weight of the chuck and the workpiece. If the pipe is not strong enough, the chuck could be damaged, causing the loss of grip force and danger of the workpiece flying from the machine.

## IMPORTANT 注意事項

螺牙鬆動是造成振動的主要原因

- 拉桿厚度 e 為最小極限值，加工螺牙 f 部份時最好選用大直徑，使 e 值儘可能最大。
- 以抗拉強度 380Mpa(38kg/mm<sup>2</sup>) 以上之材料來製作拉桿。
- 螺紋 a,d,f 同心度需在 0.05mm T. I. R 以內。

Be sure to tighten screws to the proper torque so that the vibration of the chuck does not loosen them.

- The thickness of the drawpipe "e" is the minimum limit value. The larger diameter value should be used to manufacture the thread in order to get the "e" value as high as possible.
- Use material with a tensile strength of 380mpa(38kg/mm) or higher to manufacture the draw pipe.
- The concentricity of thread "a", "b" and "f" should be within 0.05mm T.I.R.

## 5-2 製作及安裝連結盤

### The manufacture and installation of the mounting plate

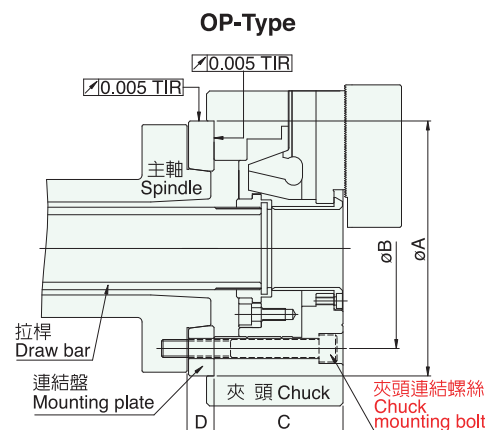
- 根據實際主軸的測量值，來加工連結盤的嚙合直徑。
- 由於連結盤的偏擺將直接影響到夾頭的精度所以連結盤端面及外徑的偏擺必須在 0.005mm 以內。
- 如果等連結盤已經裝上機器後再來加工製造接合的端面及外徑的部份那將會增加精確度。
- 連結盤在夾頭接合外徑的部份必須如下表所示的 A 值來加工在標準值 A-0.01mm 以內。
- Reference the actual measurement of the spindle in order to machine the mating diameter of the mounting plate.
- The run-out for the end face and the outer diameter of the mounting plate should be within 0.005mm so as not to affect the accuracy of the chuck.
- Machining the mating face and the outer diameter after the mounting plate is installed will improve accuracy.
- The mating outer diameter of the mounting plate should be machined to A-0.01mm (refer to the A value in the following table.)

項目 (Item)	型式 (Model)	BPC-204 OPT-204	BPC-205 OPT-205	BPC-206 OPT-206 OPF-206	BPC-208 OPT-208 OPF-208	BPC-210 OPT-210 OPF-210	BPC-212 OPT-212 OPF-212	BPC-215 OPT-215 OPF-215	BPC -218	BPC-221	BPC-224
A(H6)		85	110	140	170	220	220	300	300	380	520
B		70.6	82.6	104.8	133.4	171.4	171.4	235	235	300.2	463.6
C		55	56	76	86	95	104	127	127	140	149
D (min)		15	15	15	17	18	18	22	22	27	27
夾頭連結螺絲 Chuck mounting bolt		M10	M10	M10	M12	M16	M16	M20	M20	M24	M24

項目 (Item)	型式 (Model)	OP-210BH	OP-212BH	OP-206L OPT-206L	OP-208L OPT-208L	OP-210L OPT-210L
A(H6)		220	220	140	170	220
B		171.4	171.4	104.8	133.4	171.4
C		95	102	82	98	107
D (min)		18	18	15	17	18
夾頭連結螺絲 Chuck mounting bolt		M16	M16	M10	M12	M16

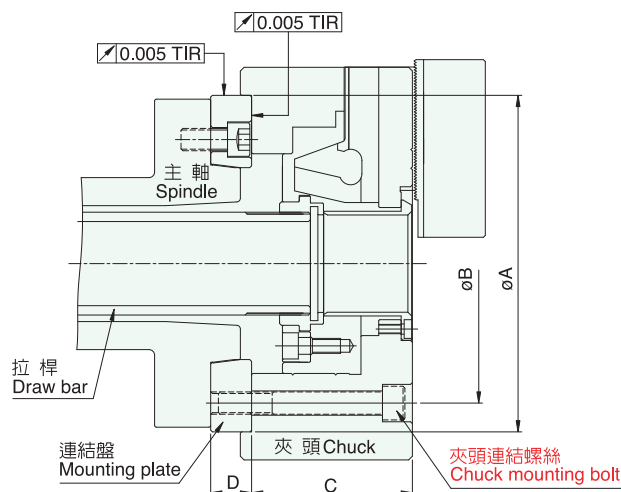
注意 :A 尺寸符合 DIN 標準

Note: "A" Dimension mounting recess diameter is according to DIN standard





### OPB-Type



項目 (Item)	型式 (Model)	OPB-206	OPB-208	OPB-210	OPB-212	OPB-218
A(H6)		140	170	220	300	380
B		122	150	180	235	330.2
C		76	86	95	103	128
D (min)		20	22	28	33	27
夾頭連結螺絲 Chuck mounting bolt		M10	M12	M16	M20	M24

注意 :A尺寸符合DIN標準

Note: "A" Dimension mounting recess diameter is according to DIN standard



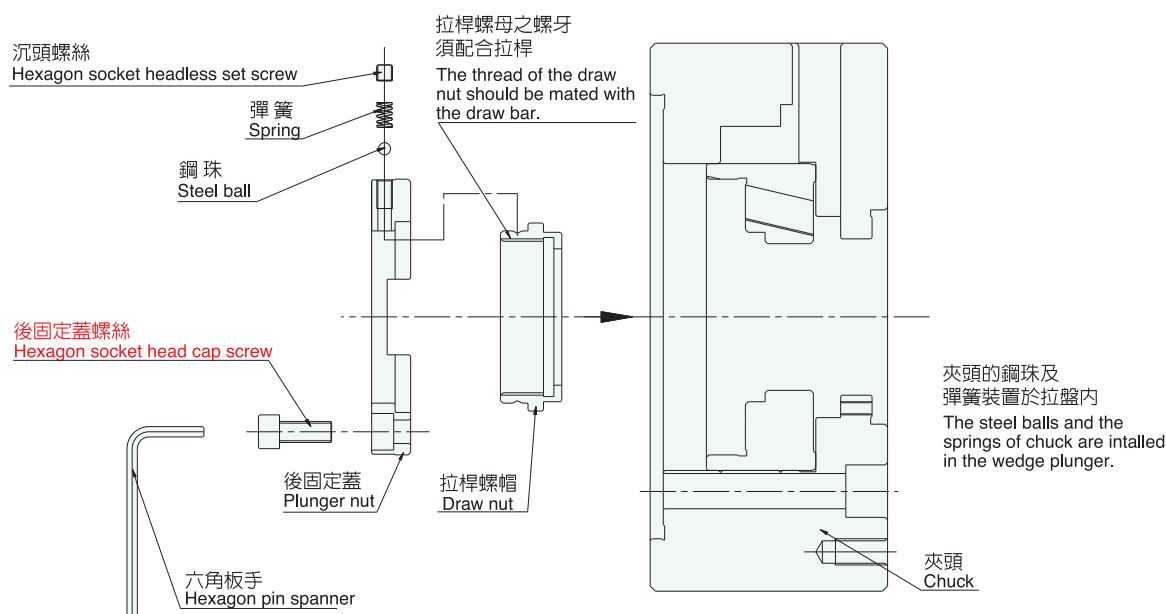
### WARNING 警告

- 夾頭連結螺絲，應有足夠之強度（直徑、數量、材質）且需有足夠之扭矩可鎖緊。
- 如鎖緊扭矩不足或太大導致螺絲斷裂而造成夾頭飛散之危險。
- The mounting screws of the chuck should have sufficient strength (diameter, quantity and material) and tighten with specified torque.
- If tightening torque is insufficient or screw broken by too much torque, the danger of the chuck scattering will be caused.

夾頭連結螺絲 Chuck mounting bolt	標準扭矩 Tightening torque	夾頭連結螺絲 Chuck mounting bolt	標準扭矩 Tightening torque
M6	12.7N·m(1.3kgf·m)	M16	250.0N·m(25.5kgf·m)
M8	38.2N·m(3.9kgf·m)	M20	402.1N·m(41.0kgf·m)
M10	72.6N·m(7.4kgf·m)	M22	539.4N·m(55.0kgf·m)
M12	106.8N·m(10.9kgf·m)	M24	637.4N·m(65.0kgf·m)
M14	170.6N·m(17.4kgf·m)		

## 5-3 中空夾頭拉桿螺帽的加工 Machining of the draw nut of the hollow chuck

- 使用六角把手將後固定蓋螺絲取出，將後固定蓋及拉桿螺帽一起取出，將鎖在後固定蓋周圍的沉頭螺絲鬆開，將拉桿螺帽取出。在這過程中，小心鋼珠及彈簧不要遺失了。
- 將拉桿螺帽車牙，必需與拉桿的螺牙一致（拉桿螺帽之牙徑不可超過  $f_{Max}$  請參考第 21 頁圖表）。
- 將拉桿螺帽裝入後固定蓋，把鋼珠及彈簧裝回後固定蓋內，再用後固定蓋螺絲將後固定蓋鎖緊。
- Remove the screws on the plunger nut with a hexagon pin spanner. Loosen the hexagon headless socket set screws on the plunger nut and remove the draw nut. Do not lose the steel balls and coil springs during this process.
- Thread the draw nut to mate with the draw pipe (the thread diameter of the draw nut cannot exceed  $f_{max}$  referred to in the table on page 21).
- Install the draw nuts with the steel balls and coil springs into the plunger nut, then tighten the plunger nut with the screws.



### WARNING 警告

- 鎖緊後固定蓋螺絲時，請依照標準扭矩鎖緊，如果鎖緊扭矩不足或是太大，將造成螺絲斷裂，工作物飛散產生危險。
- 請使用附屬之螺絲。
- Use the torque values specified below to tighten the screws of the plunger nut. If the torque is insufficient or too tight, the screw could break and the workpiece could fly from the chuck.
- Only use the included screws.

夾頭形式 Chuck model	後固定蓋螺絲 Hexagon socket head cap screw	標準扭矩 Tightening torque
BPC-204	M5	8.5N.m(0.87kgf.m)
BPC-205, 206, OPB-206, OP-206L	M6	12.7N.m(1.3kgf.m)
BPC-208, OPB-208, OPB-208L	M8	38.2N.m(3.9kgf.m)
BPC-210, 212, 215, 218 OPB-210, 212, 218 OP-210L, OP-210BH, OP-212BH	M10	72.6N.m(7.4kgf.m)
BPC-221, 224	M12	106.8N.m(10.9kgf.m)

## 5-4 中空夾頭的安裝步驟

### The installation procedure of the hollow chuck

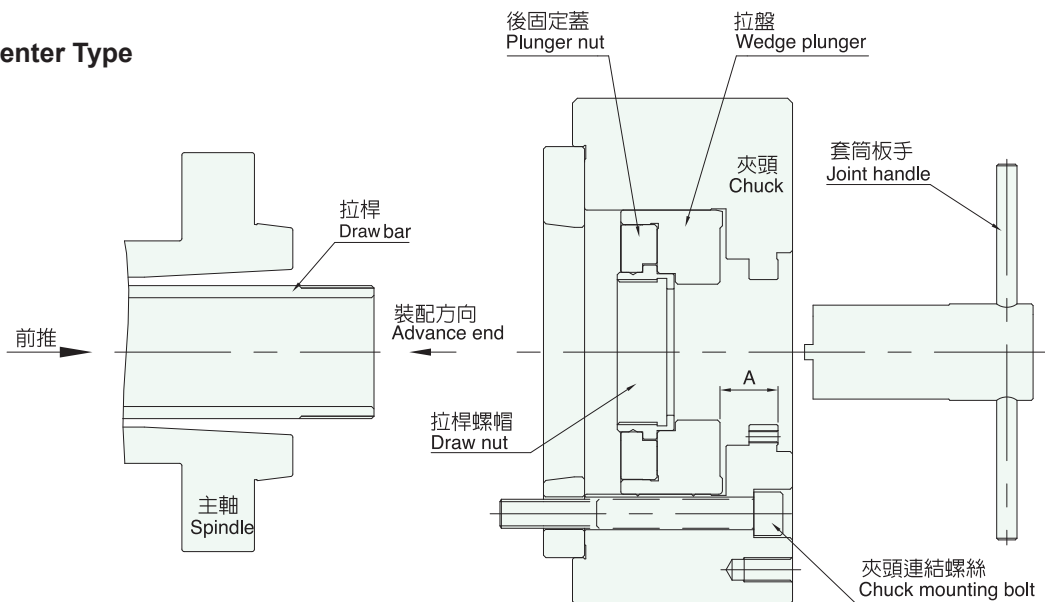
- (1) 將拉桿安裝於迴轉缸上
  - 旋入拉桿至迴轉缸之活塞螺牙內，直至活塞底止。(如未達到位置將會損壞活塞之螺旋止擋鎖)。
- (2) 將迴轉缸裝於主軸上(迴轉缸連接板)
  - 檢查迴轉缸有無偏擺及管路是否正常，設定油壓力於低壓狀態 (0.4MPa~0.5MPa, 4~5kgf/cm<sup>2</sup>)，使活塞運動 2-3 次後停置於前端，而後關掉電源。
- (1) To install the draw bar to the cylinder
  - Screw the draw bar into the piston thread of the cylinder to reach the end of the piston. (if the right position not reached, it will cause the piston locking pin damaged)
- (2) To install the cylinder to the spindle (cylinder adapter)
  - Check the run-out of the cylinder and the hydraulic pipes, and set the hydraulic pressure at low pressure condition (0.4MPa~0.5MPa, 4~5kgf/cm<sup>2</sup>), move the piston 2 or 3 times and stop the piston at the forward end, then shut down the power.



### CAUTION 注意

- 在安裝或拆下夾頭時，需使用吊帶或吊環固定 (8" 以下之夾頭不附吊環)。
- 使用後記得將吊環或吊帶從夾頭上取下。
- Using the hanger or lifting belt to install or remove the chuck (for the chuck of 8" or less, the hanger not attached).
- Be sure to remove the hanger or lifting belt after the chuck is installed or removed.

### Open Center Type



### WARNING 警告

- 如拉桿鎖入連接之螺帽螺牙不足，將損壞螺牙而使夾持力瞬間喪失造成工件飛散之危險。
- If the draw bar is not screwed into the draw nut fully, the gripping force will lose instantly due to the damaged thread, and the danger of the workpieces scattering will be caused.

### (3) 安裝夾頭至拉桿上

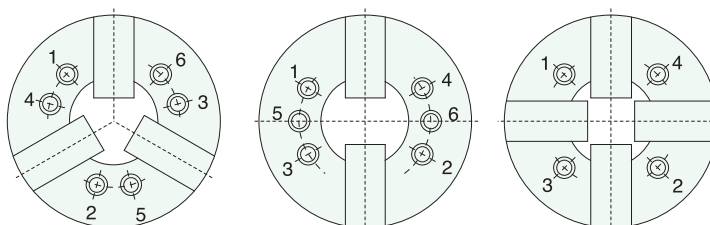
- 取下夾頭之軟爪及防塵蓋，以 1.2.3. 號螺絲鎖入數牙將套筒板手置於夾頭的中心孔上，拉桿螺帽鎖入拉桿，視油壓是否在4-5kg f/cm<sup>2</sup> 之位置，使拉桿做前後運動2~3次，並順利鎖入螺帽（參考第 24 頁）
- 拉桿螺帽鎖入於拉桿時，如不是很平順的鎖入，則應重新檢查螺牙中心是否傾斜…等，如強制鎖入則會造成精度上的誤差及螺牙損壞。

### (3) To install the chuck on the draw bar

- Remove the soft jaw and cover of the chuck, screw the mounting screws 1.2.3. for several pitches into the central holes of the chuck with the joint handle, and attach the draw nut to the draw bar. Move the draw bar back and forth for 2 ~3 times to check if the hydraulic pressure is at 4-5kg f/cm<sup>2</sup> position, then tighten the screws (refer to page 24).
- If the draw nut cannot be attached to the draw bar smoothly, the inclination of the thread centerline should be checked, to attach by force will cause the accuracy mismatched and thread damaged.

### (4) 安裝夾頭於主軸上

- 轉動套筒板手至完全結合於主軸端面
- 依下列順序鎖上螺絲  
1 → 2 → 3 → 4 → 5 → 6  
(如果鎖合力量不平均將產生偏擺)  
(鎖緊力矩參考第 23 頁)



### (4) To install the chuck to the spindle

- Turn the joint handle to attach the chuck on the mating face of the spindle entirely.
- Tighten the screws in following sequence 1 → 2 → 3 → 4 → 5 → 6  
(Uneven tightening force will induce the run-out) (The tightening torque refer to page 23)



### WARNING 警告

- 夾頭連接螺絲，請按設定之扭矩鎖緊。  
如鎖緊扭矩不足或太強將導致發生意外。
- 以配屬螺絲為使用原則，若特殊情形請採用12.9 以上（ M22 以上 10.9 ）並有足夠之長度。
- Tighten the mounting screws of the chuck with specified torque.  
If tightening torque is insufficient or too much, the accident will be caused.
- Use the attached screws only. Use 12.9 and more for special condition (10.9 for M22 and more) with sufficient length.

### (5) 使用套筒板手調整拉盤位置。

- 調整拉盤與本體保持一定距離值A(如附表)，以確保夾爪行程(參照P8~10, 13)。  
量測時油壓缸須保持在前推位置。
- 轉動拉桿螺帽調整行程，須注意停在止滑點上，避免夾盤旋轉時螺帽鬆脫。

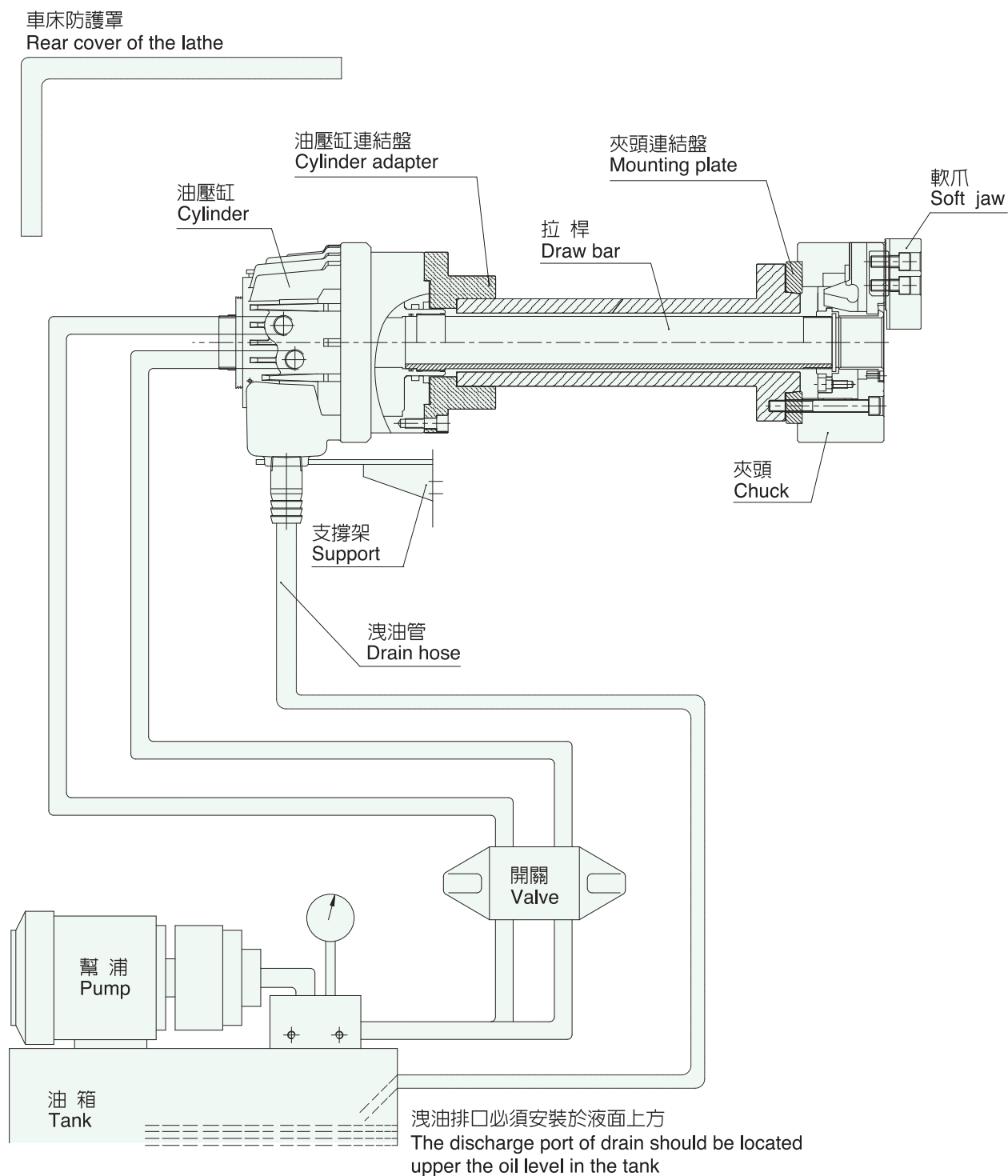
### (5) Use joint handle to adjust the position of the plunger.

- Adjust the wedge plunger to an adequate distance as dimension A (refer the following table)from the chuck body to insure the jaw stroke(refer page 8~10&page 13) : in the meantime, the hydraulic cylinder should keep at the pushing position.
- Turn the draw nut to a position where the clip stop(locking device)is effectual in case it looses when the chuck rotates.

夾頭規格 Chuck type	BPC-204 OPT-204	BPC-205 OPT-205	BPC-206 OPT-206 OPF-206 OP-206L OPT-206L	BPC-208 OPT-208 OPF-208 OP-208L OPT-208L	BPC-210 OPT-210 OPF-210 OP-210L OPT-210L	BPC-212 OPT-212 OPF-212	BPC-215 OPT-215 OPF-215	BPC-218 OPT-218 OPF-218	BPC-221 OPT-221 OPF-221	OPB-206	OPB-208	OPB-210	OPB-212	OPB-218
A	15.5	15.5	20.5	23	22.5	27	27.5	27.5	33.5	20.5	23	22.5	27	27.5

## 5-5 裝配概要圖 Assembly drawing

### Open Center Type



### 6 使用上的注意

#### Precautions

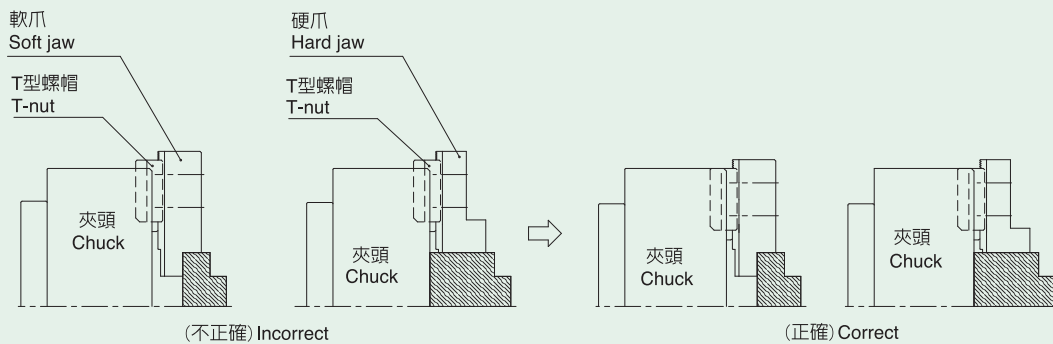
1. 當更換上爪時，必須清理基爪的齒型部分及T型螺帽的接合部分，否則將造成精度上的不準。
  2. 依照工件外形及切削情況來設定油壓壓力，如果管狀的工件被高壓夾持將造成變形。
  3. 夾持斜面或錐度的鑄品工件時，使用的特殊爪需具有齒狀之夾持面，工作物才不會飛散。
  4. 夾持偏心工作物時，偏心重量產生的離心力作用在單一爪上，加工時需使用低轉速。
  5. 不可使用與基爪排齒不合之上爪，嚙合度不足，將影響夾持力與精度，嚴重者使基爪損壞。
  6. 作業開始之前，使用低轉速試做一次，檢查上爪和工作物的位置是否與刀具，刀具座產生干涉。
  7. 如果夾持長的工作物時，使用尾座或中心架支撐另一端。
  8. 長時間停置機器時，夾頭上不可夾持工作物。
  9. 當操作不當或機械故障所造成刀具或刀具座撞擊夾頭，立即停機檢查上爪、基爪、T型螺帽、連結螺絲及夾持精度等是否正常。
  10. 特殊高度上爪使用之油壓壓力需比標準上爪低。
- 
1. The serration of the master jaw and the mating part of T-nut should be cleaned when changing the top jaw, if not can cause poor accuracy.
  2. According to the shape of the workpieces and the cutting condition to set the hydraulic pressure, the pipe-shaped workpieces will be deformed by high pressure gripping.
  3. When gripping the inclined or tapered casting workpieces, the special jaw with spikes should be used to prevent workpieces scattering.
  4. When gripping the eccentric workpieces, the centrifugal force will be induced to act on single jaw, so the low speed should be used to machined such workpieces.
  5. Do not use the top jaw with the serration pitch differ from the master jaw, if the engaging force is insufficient, the gripping force and the accuracy will be affected, and the master jaw will be damaged in the worst case.
  6. Trial run once with low speed before operation, and check if the position of the top jaw and workpiece interfere with the tool or the tool holder.
  7. Use the tailstock or steady rest at the other end, when clamping the long workpieces.
  8. Do not clamp the workpiece on the chuck when stop the machine for a long period.
  9. When the tool or tool holder interfere with the chuck due to improper operation or malfunction, stop the machine immediately to check if the top jaw, master jaw, T-nut, mounting screw and the gripping accuracy are normal.
  10. The hydraulic pressure for using the top jaw of special height should lower than that for standard jaw.





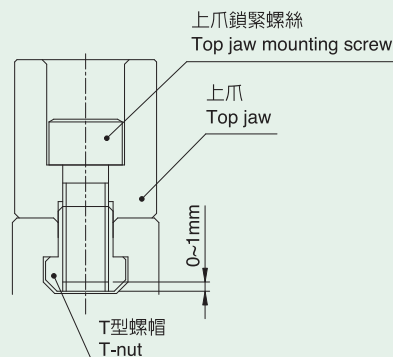
### WARNING 警告

- 工作物必須夾持於行程的中點位置，或在中點以內這樣的精度最好及穩定度將可以達成，盡量防止用行程的盡端來夾持工件。  
設定爪夾位置時必須注意 T 型螺帽，正確使用方法 T 型螺帽不可以突出基爪。(右正確)  
T 型螺帽突出基爪，不正確使用方法將造成基爪或 T 型螺帽的損壞及精度上的不準。(左不正確)
- The workpiece should be gripped at the mid stroke of the master jaw, it is the way to achieve the best accuracy, gripping at the end of the stroke should be avoided.  
To set the position of the jaw should be sure the T-nut can not protrude from the master jaw. (right side is correct)  
The T-nut protrude from the master jaw will cause the master jaw or T-nut damaged and poor accuracy. (left side is incorrect)



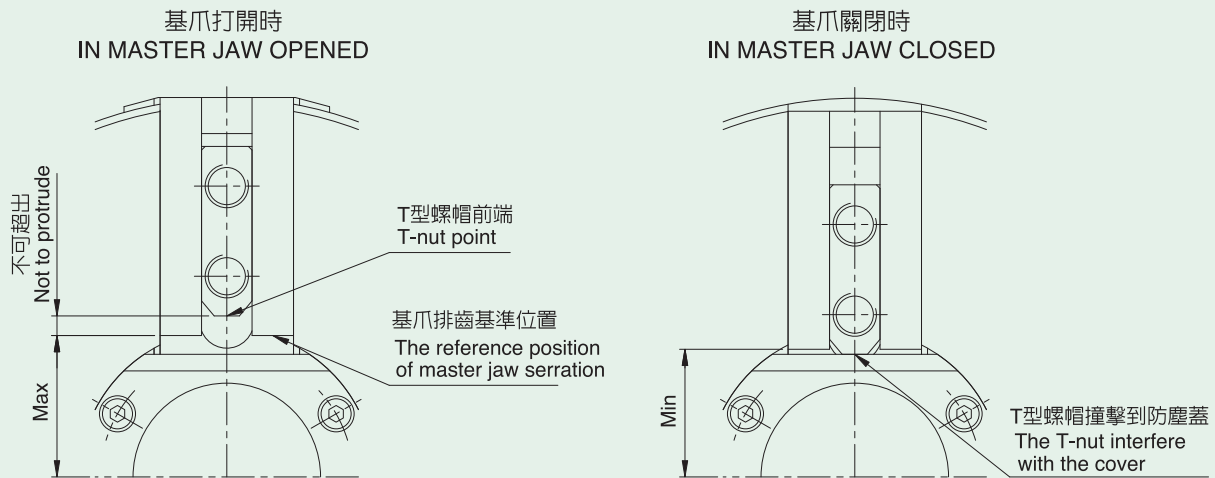
### WARNING 警告

- 如果上爪鎖緊螺絲，其鎖入 T 型螺帽內的螺紋深度太淺，將致使 T 型螺帽破損。反之，螺絲突出 T 型螺帽底部，則即使螺絲已經鎖緊也無法將上爪完全固定，因此，上爪鎖緊螺絲的全長應在距離 T 型螺帽底部內 0-1mm 長。
- 務必使用附屬之 T 型螺帽及固定螺絲(在無法避免的情況下，使用附屬以外的螺帽及螺絲，必須在 12.9 以上 (M22 以上 10.9)，的高張力螺絲並且特別注意長度是否足夠)。
- 當 T 型螺帽被鬆開時，不能啟動主軸旋轉，否則上爪及 T 型螺帽會飛散，產生危險。
- If the screwing depth for the top jaw mounting screws screwed into the T-nut is too shallow, the T-nut will be damaged. If the screws protrude from the T-nut bottom, the top jaw can not be fixed even the screws are tightened. thus, the over-all length of the top jaw mounting screws should be 0-1mm from the T-nut bottom.
- The attached T-nut and mounting screws should be used (under some unavoidable condition, use the high tension nuts and screws of the strength more than 12.9 (10.9 for M22 or more) and sufficient length.
- Do not start the spindle when T-nut is loose, otherwise, the top jaw and the T-nut scattering can be caused.



### IMPORTANT 留意事項

- 上爪是經由 T 型螺帽及連接螺絲安裝於基爪上並可在基爪排齒調整上爪的位置。
- 如果在安裝上爪時，基爪位於開端，T 型螺帽與防塵蓋的距離少於基爪的行程，那麼 T 型塊將會撞擊防塵蓋，導致防塵蓋損壞。
- The top jaw is mounted on the master jaw with the T-nut and the mounting screws, and the position of the top jaw can be adjusted on the serration of the master jaw.
- If the top jaw is mounted with the master jaw opened and the distance between the T-nut and the cover is less than the master jaw stroke, the cover will be damaged due to T-nut interferes with the cover.



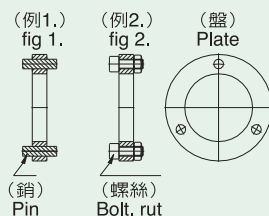
如果 T 型螺帽超出基爪排齒基準位置，T 型螺帽將會撞擊到防塵蓋，導致防塵蓋損壞。

If the T-nut protrudes from the reference position of master jaw serration, the T-nut will interfere with the cover, and cause the cover damaged.

### 7 軟爪的製造成型注意事項

#### Precautions for manufacture of the soft jaws

1. 準備一個成型圈(市販品)。
  2. 夾持成型圈時，檢查基爪是否位於行程中點附近，是否夾緊。
  3. 在成型的過程中油壓力必須與實際夾持工作物相同或較小。
  4. 在成型完成後，夾持工件檢視夾爪的行程及是否夾緊。
  5. 試作切削正常後再加工工件。
1. Prepare a forming ring (off-the-shelf).
  2. Check if the master jaw is at the mid position of the stroke when gripping the forming plug.
  3. The hydraulic pressure for forming process must be the same or less than the pressure for gripping a workpiece.
  4. Grip the workpiece to check the stroke of the jaw and the gripping force after forming.
  5. After the trial cutting is normal, then start to machine the workpiece.

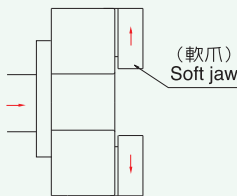


準備成型圈（市販品）

在輪狀的成型圈上分成三等分的安裝銷，螺絲或螺帽。

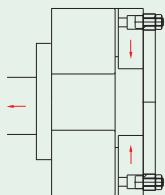
Prepare forming ring (off-the-shelf)

Make and mount studs on the trisection position of the ring (Refer to the figure 1,2).



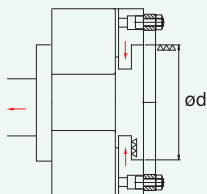
操作切換閥把基爪打開到最大。

Fully open master jaws with the valve.



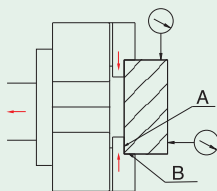
將成型圈插入軟爪上孔操作切換閥夾住成型圈突出部份，此時將成型圈的端面押至軟爪的頂端，並使之不振動，確認夾爪不可突出夾頭外周。

Insert the studs into the bolt holes of top jaws, push the ring face to the surface of soft jaws, then move the jaws by appropriate torque to lock the ring firmly.



在夾持著成型圈狀態下，切削軟爪夾持部份 (ød) 或請加工和工作物的把握部直徑相同 (H7程度) 表面粗度為 6S 以下。

With the ring gripped, machine the holding parts of the soft jaws with the (ød) that is the same as the diameter of workpiece (H7 engagement), roughness should be below 6s.



成型後，夾持工作物，確認夾爪之行程，再執行程式切削，並確認加工精度，請以 A 面及 B 面為夾持之接觸面。

After forming soft jaws, check the jaw stroke, start trial machining then measure the accuracy of the workpiece. As the figure showed, A and B are contact faces with workpiece.

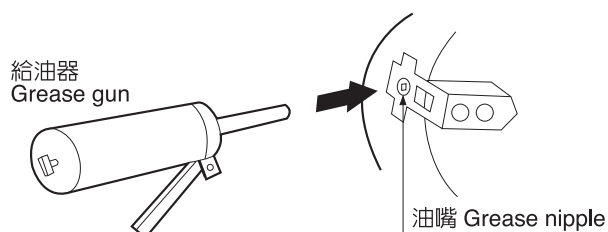
### 8 維護及檢查 Maintenance and inspection



**WARNING**

**警告**

- 為了常保夾頭在長時間的使用仍然有良好的精度，潤滑工作是很重要的。  
不正確或不適合的潤滑將導致一些問題例如：在低壓時的不正常功能，夾持力的減弱，夾持精度不良，不正常的磨損及卡住，所以必須正確的潤滑夾頭。
- 使用夾頭潤滑油或二硫化鉬潤滑油。
- To maintain the accuracy of the chuck for long time operation, regular lubrication is very important. Improper lubrication will lead to malfunction at low hydraulic pressure such as: reduction of the gripping force and the poor gripping accuracy, abnormal wear and seizure, so the chuck should be lubricated properly.
- The chuck grease or moly sulfide grease should be used for chuck lubrication.
- 作業終了時請務必以風槍或類似的工具來清潔夾頭本體及滑道面。
- 使用具有防鏽效果的切削油，可以預防夾頭內部生鏽，萬一生鏽會降低夾持力，必須要特別注意。
- At the end of the operation, an air gun or similar tool should be used to clean the chuck body and slideway.
- Apply the rust prevention cutting oil on the chuck to prevent rust, notice that the rust can reduce the gripping force.



**WARNING**

**警告**

- 至少每六個月必須將夾頭取下做一次徹底的清潔，  
但如果切削鑄鐵每二個月至少一次或多次來徹底清潔。
- 檢查各部零件有無破裂及磨損之情形，嚴重者立刻更換新品。  
檢查完畢後，要充分給油，才能組立。
- Disassemble and clean the chuck entirely at least once per 6 months, but for casting parts cutting, clean the chuck entirely at least once or more per 2 months.
- Inspect every part and replace the broken and worn parts.  
After inspection, lubricate the parts fully before reassembling.

### Open Center Type

分解中空油壓夾頭的步驟(參考第 11 和 14 頁)

為了安全起見，拆下來頭時須使用吊帶及吊環。

- (1) 鬆開鎖緊上爪螺絲，並且取出上爪及 T 型螺帽。
- (2) 取出防塵蓋
- (3) 用套筒板手將拉桿螺帽與拉桿分離。
- (4) 將夾頭固定螺絲鬆開，取下來頭。
- (5) 由夾頭後方取下拉盤。
- (6) 將基爪推向本體的中心方向，由本體的後端將其取出。
- (7) 將後固定蓋由拉盤內取出，同時將拉桿螺帽取出。

The procedure to disassemble the hollow power chuck (ref. to page 11 and 14)

For safety reason, the hanger and lifting belt should be used to disassemble the chuck.

- (1) Loosen the fixed screws on the top jaw to remove the top jaw and t-nuts.
- (2) Remove the cover.
- (3) Use the joint handle to remove the draw nut from the draw bar.
- (4) Loosen the mounting screws on the chuck and remove the chuck.
- (5) Remove the wedge plunger from the rear end of the chuck.
- (6) Push the master jaw toward the centerline of the body, remove it from the rear end of the body.
- (7) Remove the plunger nut from the wedge plunger and remove the draw nut at the same time.

- 分解後，將各部零件徹底的用柴油來清潔後晾乾，將本體內的碎屑、雜物…等徹底的清除，另外拉盤及基爪亦是如此的徹底清潔，而後塗上潤滑油脂，此時須使用優良潤滑油，如果用的潤滑油不良將造成夾持力減半或卡住故障。
- 組合時依照上述的拆卸程序反過來做，但必須確實注意零件的數量及位置都不能有錯誤。
- 拉盤組回爪殼時應注意端面刻印的1記號，對準爪殼1號爪的滑槽，這樣的組裝才正確。
- After disassembly, clean every part with diesel fuel entirely and dry them, then apply the grease of good quality on the interior of the chuck, wedge plunger and master jaw. The grease of bad quality can cause the reduction of gripping force or seizing.
- For reassembly, perform operation following the reverse order of the disassembly. Be sure that there is no mistake on the part number and the position.
- It is correct assembly and noticed that the stamped No.1 wedge plunger should be aimed at the stamped No.1 slipping runner of the chuck body.

### 9 故障排除

如夾頭故障，請停下來檢查，依下列狀況來處理

不正常情況	原因	對策
夾頭不能動作	夾頭零件損壞	分解夾頭及更換零件
夾頭不能動作	夾頭滑動部位被卡住	分解夾頭以油石去除毛邊再上油
夾頭不能動作	油壓缸停止運作	檢視油壓系統，如減壓閥、洩壓閥等是否正常
基爪行程不足	夾頭內部積存太多雜屑	夾頭分解後清理
基爪行程不足	拉桿鬆掉	轉動拉桿及鎖緊
工作物有滑動情況	爪行程不足	重新調整軟爪使得基爪位於行程的中點
工作物有滑動情況	夾頭夾持力不足	檢視所設定的油壓壓力是否適當
工作物有滑動情況	上爪的成型直徑與工作物的直徑不同	使用正確的成形方法重新做一次
工作物有滑動情況	切削力量過大	重新設定切削量並確認轉速與進刀速的值
工作物有滑動情況	基爪滑道潤滑油不足	依據潤滑過程重新潤滑各部爾後在沒有工件下操作數次
工作物有滑動情況	迴轉速度過高	降低迴轉數到標準值，並重新測試
精度不良	夾頭之外徑偏擺過大	校正外徑或端面的偏擺及鎖緊螺絲
精度不良	灰塵堆積於基爪或上爪的齒狀部位 基爪與上爪的固定螺絲沒有鎖緊	取下上爪並完全清理， 以適當扭矩鎖緊固定螺絲
精度不良	在成型上爪的過程不當或沒有充分做完	成型圈放置是否適當，檢查油壓壓力及上爪成型部份的表面粗糙度
精度不良	上爪的高度過高已超過標準，導致上爪變形或上爪固定螺絲因伸出太長而變形	降低上爪的高度或適當調降油壓壓力
精度不良	夾持力過大，工作物變形	降低夾持力至適當程度，使得機器可以夾緊工作物但不致變形

備註：

簡單之故障請自行處理，如無法自行處理或特殊狀況時，可通知各地經銷商或與本公司連繫。我們將於接到問題後立即為客戶服務。



### 9 Troubleshooting

If the chuck malfunctions, please stop and check with following conditions.

Abnormal conditions	Reason	Solutions
Chuck is not work	Damage of the chuck	Disassemble the chuck and replace the parts
Chuck is not work	Chuck was blocked	Disassemble the chuck, deburr with the oilstone and apply the grease.
Chuck is not work	Hydraulic cylinder is not working	Check the hydraulic system, such like if the control valve or tubes is normal.
Insufficient master jaw stroke	Too much debris inside the chuck	Disassemble and clean the chuck
Insufficient master jaw stroke	The draw bar is loose	Turn and tighten the draw bar
Sliding workpiece	Insufficient stroke of the jaw	Rearrange the soft jaw in order to place the master jaw at the stroke center.
Sliding workpiece	Insufficient clamping force of the chuck	Check the pressure setting is normal.
Sliding workpiece	The forming diameter of the top jaw is different from the diameter of the workpiece.	Reform the top jaw by the correct method.
Sliding workpiece	Too much cutting force	Re-set the cutting depth and confirm the rpm and feeding speed.
Sliding workpiece	Insufficient grease of the master jaw slide.	Follow the lubrication process to lubricate every part again, and then operate without workpiece few times.
Sliding workpiece	Rpm is too high	Lower the rpm to the specified value, and re-test it.
Poor accuracy	Run-out of the outer diameter of the chuck is too big	Correct the outer diameter or the run-out of the end face, and tighten the screws.
Poor accuracy	Dust on the serrations of the master jaw or the top jaw. The mounting screws of the master jaw and the top jaw not tighten.	Remove and clean the top jaw, tighten the screws with proper torque.
Poor accuracy	The process of the top jaw forming is not proper or not finished.	Check if the forming plug location is proper, and check the setting pressure and the surface roughness of the top jaw.
Poor accuracy	The height of the top jaw exceed the standard, and induce the deformation of top jaw or the mounting screws deformed due to long extension.	Reduce the height of the top jaw or reduce the pressure properly.
Poor accuracy	Too much clamping forces to deform the workpiece.	Reduce the clamping force to the proper level, in order to clamp the workpiece tight but not to deform it.





2155 Traversefield Dr  
Traverse City, MI 49686  
800-228-BUCK  
[www.buckchuck.com](http://www.buckchuck.com)  
[info@buckchuck.com](mailto:info@buckchuck.com)