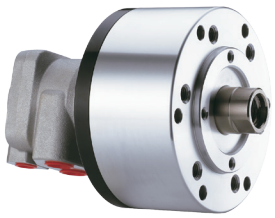
# RK / RH / RS / RL
# RD / RDL type
# 中實迴轉油壓缸
## ROTARY HYDRAULIC CYLINDER

# 使 用 說 明 書
## INSTRUCTION MANUAL
## Original instructions

重要 Important Notes：

- 請仔細閱讀本說明書，充分瞭解之後再使用本製品。
  本說明書請妥善保管，製品使用者變更時，請將此說明書交給新的使用者。
- Before you use the product.Please read this insturction carefully.
  Keep the instruction carefully. If the user of the product altered,
  please hand the instruction to the new user.



## ◎序 言

為了確保你的安全，在使用你的中空迴轉油壓缸之前，請務必詳閱本說明書內所記載之警告事項，並特別注意文中此 ⚠ 圖形符號下之說明。

## ◎ INTRODUCTION

To ensure safe operation of your Hydraulic Rotary Cylinder with Thru-Hole , please read this instruction manual and pay particular attention to instructions marked with ⚠ including IMPORTANT instructions concerning cylinder performance.

**DANGER 危 險**

→ **若未依照此符號底下的說明來操作機械將引起立即的危險，導致重大傷害或死亡。**
**Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.**

**WARNING 警 告**

→ **若未依照此符號底下的說明來操作機械將引起潛在的危險，導致重大傷害或死亡。**
**Indicates an potentially hazardous situation which, if not avoided, could result in death or serious injury.**

**CAUTION 注 意**

→ **若未依照此符號底下的說明來操作機械將引起潛在的危險，導致中輕度的傷害。**
**Indicates an potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**

**IMPORTANT 留 意 事 項**

→ **依照此符號底下的說明事先了解製品的性能，可避免不正確的操作夾頭。**
**Indicates for chuck performance and avoiding errors of mistake.**

# 目 錄


1. 注意事項 ..... 3
2. 規格 ..... 7
3. 安裝
3.1 中實迴轉缸安裝概要 .....10
3.2 油壓缸連結板的製作及安裝 .....11
3.2.1 雙桿型迴轉油壓缸連結板的製作及安裝 12
3.3 拉桿的製作及安裝 .....13
3.3.1 雙拉桿的製作及安裝 (RD/RD-N type)...14
3.3.2 外掛接頭雙拉桿的製作及安裝 (RDL type) .....15
3.4 安裝油壓缸 .....16
3.5 安裝油壓缸的正確方式及鎖緊力矩 ..... 17
4. 油壓迴路之設計 ..... 18
5. 安裝控制閥油壓系統及配管 .....19
6. 油壓油 ..... 20
7. 操作測試 .....21
8. 近接開關
8.1 近接開關規格 .....22
8.2 近接開關的位置調整 .....23
9. 維護及檢查 .....23
10. 故障排除 .....24
11. 迴轉油壓缸零件分解圖
11.1 RK 型零件分解圖 .....25
11.2 RK-N 型零件分解圖 .....26
11.3 RH 型零件分解圖 .....27
11.4 RS 型零件分解圖 .....28
11.5 RS-N 型零件分解圖 .....29
11.6 RL 型零件分解圖 .....30
11.7 RL-N 型零件分解圖 .....31
11.8 RL-AN 型零件分解圖 .....32
11.9 RD 型零件分解圖 .....33
11.10 RD-N 型零件分解圖 .....34
11.11 RDL 型零件分解圖 .....35


# CONTENTS


1. For safe operation ..... 3
2. Specifications ..... 7
3. Mounting
3.1 Outlin e of mounting ..... 10
3.2 Preparation and mounting of cylinder adapter ..... 11
3.2.1 Preparation and mounting of Doublerod Rotary cylinder ..... 12
3.3 Preparation and mounting of draw bar ..... ..... 13
3.3.1 Mounting of Double draw bar (RD/RD-N type) ..... 14
3.3.2 Mounting of Double draw bar(RDL type).....15
3.4 Mounting of cylinder .....16
3.5 Use correct method and tightening torque to mounting cylinder ..... 17
4. Design the Oil circuit..... 18
5. Attachment of control valve, hydraulic unit and piping ..... 19
6. Hydraulic oil ..... 20
7. Test run ..... 21
8. Proximity switch
8.1 Proximity switch spe cifications ..... 22
8.2 Adjusting the position of a proximity switch ..... 23
9. Maintainence and inspection ..... 23
10. Troubleshooting ..... 24
11. Parts list of cylinder
11.1 RK type parts list .....25
11.2 RK-N type parts list .....26
11.3 RH type parts list .....27
11.4 RS type parts list .....28
11.5 RS-N type parts list .....29
11.6 RL type parts list .....30
11.7 RL-N type parts list .....31
11.8 RL-AN type parts list .....32
11.9 RD type parts list .....33
11.10 RD-N type parts list .....34
11.11 RDL type parts list .....35

# 注 意 事 項 FOR SAFE OPERATION

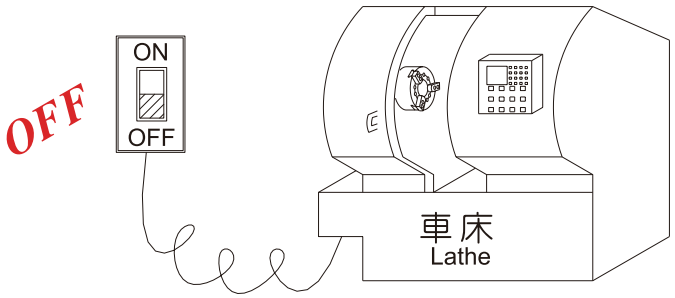
請詳閱本說明書，並依循指示說明。若未依照指示，錯誤的使用而致引起的損傷或意外事，本公司概不負責。

Please read this manual and following instructions carefully. We cannot assume responsibility for damage or accidents caused by misuse, through noncompliance with the safety instructions.

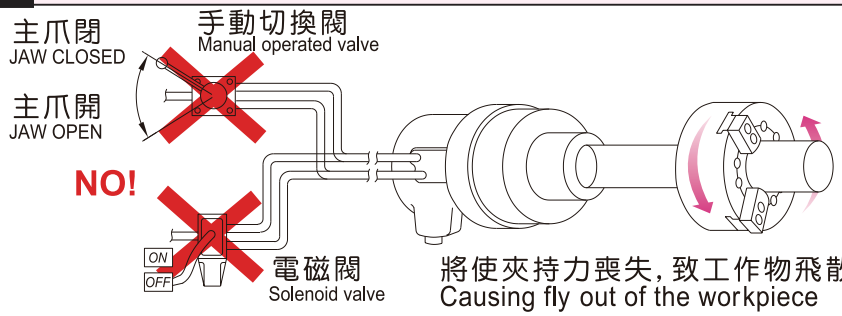
## DANGER 危 險

在安裝檢查或潤滑油壓缸時，務必關掉所有電源，確保操作者之安全。
SWITCH OFF power before setting, inspecting, lubricating or changing the chuck to ensure operator safety.

易發生身體或衣物捲入等意外事故。
To avoid accident of operator body or clothes drawn into machine.

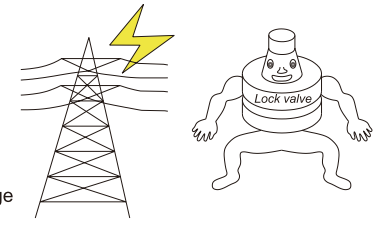



當主軸迴轉時，切勿操作切換閥。
Never operate the selector valve and the solenoid valve and the air supply during the spindle rotation.

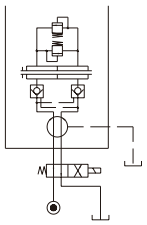



某些型式的油壓缸內建有＂逆止閥＂機構，當電源意外中斷時，能防止油壓缸內部壓力驟降，保持穩固的夾持。
In case of power failure, AUTOGRIP's some cylinders are fitted with check valves and pressure relief valve . When power is restored, the solenoid valve resumes its normal function.

停電時喪失夾持力，致使工作物飛散產生危險.
Power outage may cause fly-out of the workpiece.




停電
Power outage

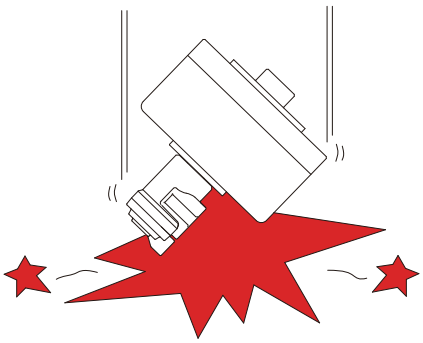


設定工作在正確的夾持位置
Set the workpiece to the correct gripping position.

**WARNING**
**警　告**

勿使油壓缸受到衝擊或碰撞。
Never shock the cylinder.

油壓缸破損，將導致工件飛出之危險。
Danger by fly-out of clamping workpiece in case of damaging of cylinder.

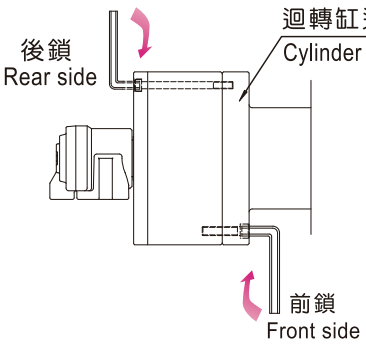


依標準力矩確實鎖緊螺絲。
Tightening the clamp bolts with correct torque.

後鎖側的場合 (RH 型、RD 型沒有 )
Rear side(RH、RD type nonuse)

| 螺絲規格 Bolt size | 鎖緊力矩 Tightening torque |
|---|---|
| M8 | 38.2 N・m (3.9 kgf・m) |
| M10 | 72.6 N・m (7.4 kgf・m) |

油壓缸鬆脫，將導致工件飛出之危險。
Danger by fly-out of clamping workpiece in case of loosening of cylinder.

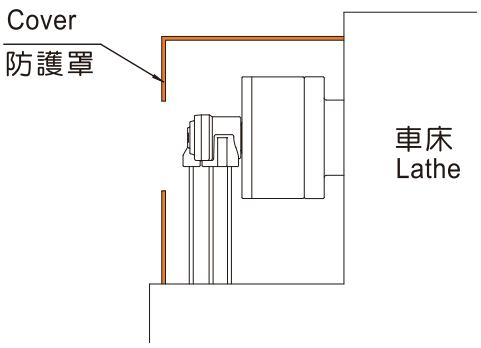



前鎖側的場合 Front side

| 螺絲規格 Bolt size | 鎖緊力矩 Tightening torque |
|---|---|
| M8 | 31.5 N・m (3.2 kgf・m) |
| M10 | 60.0 N・m (6.1 kgf・m) |
| M12 | 87.0 N・m (8.9 kgf・m) |
| M16 | 205.0 N・m (20.9 kgf・m) |

油壓缸外圍須以防護罩蓋住。
Be sure to cover the periphery of cylinder.

如無防護罩，易發生肢體或衣物捲入等意外事故。
Danger by catching of operator in a machine.



## WARNING
## 警 告

油壓缸可容許之最大壓力請參考各油壓缸之最高使用壓力，但設定使用壓力時，需考量夾頭的適用性。
The maximum hydraulic pressure of cylinder please refer to the Max. Pressure of each hydraulic cylinder,but set hydraulic pressure need according to chuck speicification.

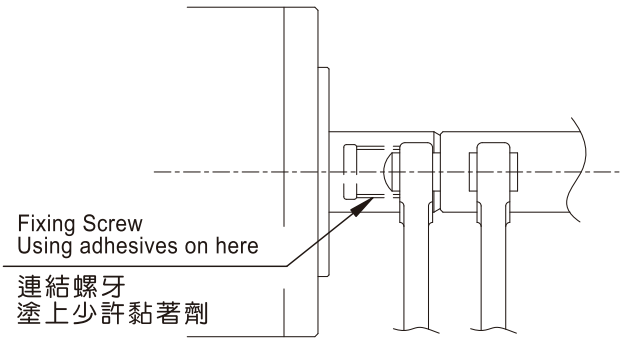
如油壓力超過容許最大值，將使油壓缸受損，甚至使夾頭變形或破裂之危險。
If hydraulic pressure is exceeded, the cylinder or the chuck may be deformed or broken.


操作機器前，請勿喝酒或服用麻醉性藥物。
Never attempt to operate machine after drinking alcohol taking drugs.

判斷力差時，容易操作錯誤十分危險。
Danger by operational fault and lowering judgement.


拉桿螺紋處塗上防鬆接著劑，再依標準力矩鎖緊。
Coat the threaded part of the draw pipe with adhesive and screw it with the specified torque.

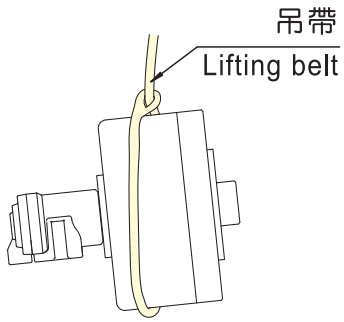
如拉桿鬆脫的話，會使爪行程變短。
If draw bar becomes loose, the jaw stroke of the chuck will becomes short.



CAUTION
注 意

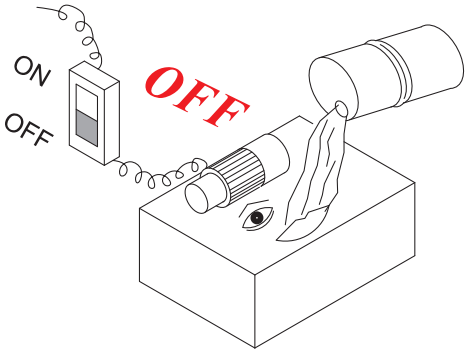
拆裝油壓缸時，請使用吊帶。
When mounting or unmounting the cylinder, use a lifting belt.

掉落時十分危險。
Danger by dropping.



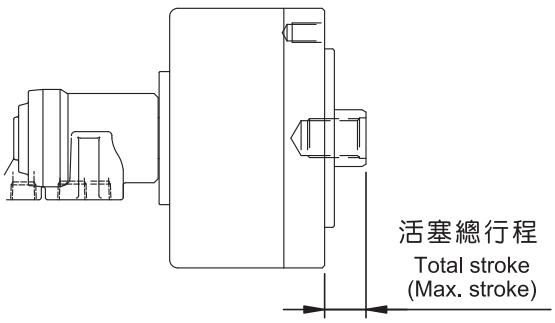

供給足夠的油壓油，且先關掉電源。
Turn off power source and supply specified oil.

油壓油不足將使得油壓缸作動速度變慢，推力不足，導致夾持力減弱，工作物飛散而十分危險。
Danger by discharge of workpiece incompletely gripped because of slow operation speed or insufficient thrust.




請勿自行改造油壓缸活塞總行程.
Don't attempt to modify the total stroke of piston by yourself.

不當改造活塞總行程,將損害油壓缸而無法發揮正常功能。
如有需要改變活塞行程，請與我們聯繫。
Danger by function damage of cylinder.
If you have need to do it, please contact us.



# 2. 規格

## 2.1 附逆止閥中實迴轉油壓缸 (RK type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RK-75 | 44.2 | 37.1 | 15 | 6000 | 4.0 (40) | 0.01 | 2.9 |
| RK-100 | 78.5 | 71.5 | 20 | 6000 | 4.0 (40) | 0.03 | 4.4 |
| RK-125 | 122.7 | 113.1 | 25 | 6000 | 4.0 (40) | 0.05 | 6.9 |
| RK-150 | 176.7 | 160.8 | 30 | 5500 | 4.0 (40) | 0.09 | 9.5 |
| RK-200 | 314.1 | 290.4 | 35 | 5500 | 4.0 (40) | 0.28 | 15.4 |
| RK-250 | 469.1 | 436.0 | 60 | 2000 | 5.0(50) | 0.40 | 45.2 |

## 2.2 中實迴轉油壓缸 (RK-N type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RK-75N | 44.2 | 37.1 | 15 | 6000 | 4.0(40) | 0.01 | 2.8 |
| RK-100N | 78.5 | 71.5 | 20 | 6000 | 4.0(40) | 0.03 | 4.3 |
| RK-125N | 122.7 | 113.1 | 25 | 6000 | 4.0(40) | 0.05 | 6.8 |
| RK-150N | 176.7 | 160.8 | 30 | 5500 | 4.0(40) | 0.09 | 9.4 |
| RK-200N | 314.1 | 290.4 | 35 | 5500 | 4.0(40) | 0.28 | 15.3 |
| RK-250N | 469.1 | 436.0 | 60 | 2000 | 5.0(50) | 0.40 | 45.2 |

## 2.3 中實迴轉油壓缸 (RH type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RH-65 | 31.0 | 27.9 | 15 | 6000 | 3.5(35) | 0.01 | 2.9 |
| RH-80 | 47.7 | 42.8 | 15 | 6000 | 3.5(35) | 0.01 | 3.4 |
| RH-100 | 75.4 | 70.5 | 20 | 5500 | 3.5(35) | 0.04 | 4.9 |
| RH-125 | 119.6 | 112.5 | 25 | 5500 | 3.5(35) | 0.08 | 6.8 |
| RH-200 | 310.0 | 286.3 | 35 | 4000 | 4.0(40) | 0.38 | 20.4 |

## 2.4 附逆止閥行程控制型迴轉油壓缸 (RS type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RS-75 | 43.0 | 37.1 | 15 | 6000 | 4.0 (40) | 0.01 | 3.4 |
| RS-100 | 77.4 | 71.5 | 20 | 6000 | 4.0 (40) | 0.04 | 4.9 |
| RS-125 | 121.6 | 113.1 | 25 | 6000 | 4.0 (40) | 0.05 | 7.4 |
| RS-150 | 175.6 | 160.8 | 30 | 5500 | 4.0 (40) | 0.10 | 10.7 |
| RS-200 | 313.0 | 290.4 | 35 | 5500 | 4.0 (40) | 0.29 | 15.9 |

# 2. SPECIFICATIONS

## 2.1 ROTATING HYDRAULIC CYLINDER WITH SAFETY DEVICE(RK type)

## 2.2 ROTATING HYDRAULIC CYLINDER (RK-N type)

## 2.3 ROTATING HYDRAULIC CYLINDER (RH type)

## 2.4 ROTATING HYDRAULIC CYLINDER WITH STROKE CONTROL AND SATETY DEVICE(RS type)

## 2.5 行程控制型迴轉油壓缸 (RS-N type)

## 2.5 ROTATING HYDRAULIC CYLINDER WITH STROKE CONTROL (RS-N type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RS-6520N | 32.0 | 28.3 | 20 | 6000 | 4.0(40) | 0.01 | 3.2 |
| RS-6530N | 32.0 | 28.3 | 30 | 6000 | 4.0(40) | 0.01 | 3.3 |
| RS-75N | 43.0 | 37.1 | 15 | 6000 | 4.0(40) | 0.01 | 3.3 |
| RS-7530N | 43.0 | 37.1 | 30 | 6000 | 4.0(40) | 0.013 | 3.7 |
| RS-100N | 77.4 | 71.5 | 20 | 6000 | 4.0(40) | 0.04 | 4.8 |
| RS-125N | 121.6 | 113.1 | 25 | 6000 | 4.0(40) | 0.05 | 7.3 |
| RS-150N | 175.6 | 160.8 | 30 | 5500 | 4.0(40) | 0.16 | 10.6 |
| RS-200N | 313.0 | 290.4 | 35 | 5500 | 4.0(40) | 0.29 | 15.9 |

## 2.6 附逆止閥注水型迴轉油壓缸 (RL type)

## 2.6 ROTATING HYDRAULIC CYLINDER WITH COOLANT CONNECTION AND SATETY DEVICE(RL type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | 注水孔 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Coolant connection Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | MPa ($kgf/cm^2$) | kg・$m^2$ | kg |
| RL-75 | 42.6 | 37.1 | 15 | 6000 | 4.0(40) | 3.5(35) | 0.01 | 3.1 |
| RL-100 | 77.0 | 71.5 | 20 | 6000 | 4.0(40) | 3.5(35) | 0.04 | 4.6 |
| RL-125 | 121.2 | 113.1 | 25 | 6000 | 4.0(40) | 3.5(35) | 0.06 | 7.1 |
| RL-150 | 175.2 | 160.8 | 30 | 5500 | 4.0(40) | 3.5(35) | 0.10 | 9.7 |
| RL-200 | 312.5 | 290.4 | 35 | 5500 | 4.0(40) | 3.5(35) | 0.30 | 15.6 |

## 2.7 注水型迴轉油壓缸 (RL-N type)

## 2.7 ROTATING HYDRAULIC CYLINDER WITH COOLANT CONNECTION (RL-N type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | 注水孔最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Coolant connection Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | MPa ($kgf/cm^2$) | kg・$m^2$ | kg |
| RL-75N | 42.6 | 37.1 | 15 | 6000 | 4.0 (40) | 3.5(35) | 0.01 | 3.0 |
| RL-100N | 77.0 | 71.5 | 20 | 6000 | 4.0 (40) | 3.5(35) | 0.04 | 4.5 |
| RL-125N | 121.2 | 113.1 | 25 | 6000 | 4.0 (40) | 3.5(35) | 0.06 | 7.0 |
| RL-150N | 175.2 | 160.8 | 30 | 5500 | 4.0 (40) | 3.5(35) | 0.10 | 9.6 |
| RL-200N | 312.5 | 290.4 | 35 | 5500 | 4.0 (40) | 3.5(35) | 0.29 | 15.5 |

注意：注水孔 PV 限制值 | Note：PV Limit value 14400 MPa r / m with coolant connection

## 2.8 注氣型迴轉油壓缸 (RL-AN type)

## 2.8 ROTATING HYDRAULIC CYLINDER WITH AIR CONNECTION(RL-AN type)

| 型號 | 活塞面積 Eff. piston area | | 行程 | 最高迴轉數 | 最高使用壓力 | 注氣部最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|---|
| Model | 押側 (Extend) | 拉側 (Retract) | Piston stroke | Max. speed | Max. pressure | Air connection Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | MPa ($kgf/cm^2$) | kg・$m^2$ | kg |
| RL- A75N | 42.6 | 37.1 | 15 | 6000 | 4.0(40) | 0.8(8) | 0.01 | 3.0 |
| RL- A100N | 77.0 | 71.5 | 20 | 6000 | 4.0(40) | 0.8(8) | 0.04 | 4.5 |
| RL- A125N | 121.2 | 113.1 | 25 | 6000 | 4.0(40) | 0.8(8) | 0.06 | 7.0 |
| RL- A150N | 175.2 | 160.8 | 30 | 5500 | 4.0(40) | 0.8(8) | 0.10 | 9.6 |
| RL- A200N | 312.5 | 290.4 | 35 | 5500 | 4.0(40) | 0.8(8) | 0.29 | 15.5 |

## 2.9 附逆止閥雙桿型迴轉油壓缸 (RD type)

## 2.9 DOUBLE ROD ROTATING CYLINDER WITH SAFETY DEVICE(RD type)

| 型號 | 活塞面積 Eff. piston area | | | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|---|---|
| | 押側 (Extend) | | 拉側 (Retract) | | | | | | |
| Model | A | B | A | B | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RD-120 | 122.7 | 126.1 | 116.1 | 113.1 | 20 | 5000 | 3.0(30) | 0.14 | 11.3 |
| RD-125 | 122.7 | 126.1 | 116.1 | 113.1 | 25 | 5000 | 3.0(30) | 0.15 | 11.5 |

## 2.10 雙桿型迴轉油壓缸 (RD-N type)

## 2.10 DOUBLE ROD ROTATING CYLINDER (RD-N type)

| 型號 | 活塞面積 Eff. piston area | | | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|---|---|
| | 押側 (Extend) | | 拉側 (Retract) | | | | | | |
| Model | A | B | A | B | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RD-120N | 122.7 | 126.1 | 116.1 | 113.1 | 20 | 5000 | 3.0(30) | 0.14 | 11.2 |
| RD-125N | 122.7 | 126.1 | 116.1 | 113.1 | 25 | 5000 | 3.0(30) | 0.15 | 11.4 |

## 2.11 外掛接頭雙桿型迴轉油壓缸 (RDL type)

## 2.11 DOUBLE ROD ROTATING CYLINDER WITH ROTATING JOINT (RDL type)

| 型號 | 活塞面積 Eff. piston area | | | | 行程 | 最高迴轉數 | 最高使用壓力 | I | 重量 |
|---|---|---|---|---|---|---|---|---|---|
| | 押側 (Extend) | | 拉側 (Retract) | | | | | | |
| Model | A | B | A | B | Piston stroke | Max. speed | Max. pressure | Moment of inertia | Weight |
| | $cm^2$ | $cm^2$ | $cm^2$ | $cm^2$ | mm | $min^{-1}$(r.p.m.) | MPa($kgf/cm^2$) | kg・$m^2$ | kg |
| RDL-160S | 68.3 | 190.6 | 68.3 | 172.8 | 25/55 | 4000 | 5.0(50) | 0.025 | 26 |

註 1) 活塞推力的計算方式。

$$\text{活塞推力(KN)} = \text{活塞最大推力(KN)} \times \frac{\text{使用油壓力(MPa) -0.25 (MPa)}}{\text{最高油壓力(MPa) -0.25 (MPa)}}$$

Note 1) Calculate the piston thrust.

$$\text{Piston thrust(KN)} = \text{Max. piston thrust(KN)} \times \frac{\text{Hydraulic pressure(MPa)-0.25(MPa)}}{\text{Max. hydraulic pressure(MPa)-0.25(MPa)}}$$

註 2) 自鎖機構
防止油壓缸內部壓力的驟降，即使當高速旋轉時由於電力喪失或油壓供應的損害而造成油壓壓力力驟降到不正常的低標準下。

Note 2) The Locking mechanism
Temporarily maintains the hydraulic pressure in the cylinder if the pump pressure is immediately reduced because power fails or the hydraulic pump troubles.

# 3. 安裝

## 3.1 中實油壓缸安裝概要

中實油壓夾頭安裝於車床主軸前方，後方裝置中實迴轉油壓缸，再以拉桿連接。

# 3. MOUNTING

## 3.1 Mounting of rotating hydraulic cylinder

Mount the closed center hydraulic chuck to the front of the lathe spindle, and closed center rotary hydraulic cylinder to the rear. Connect the both units with draw bar.

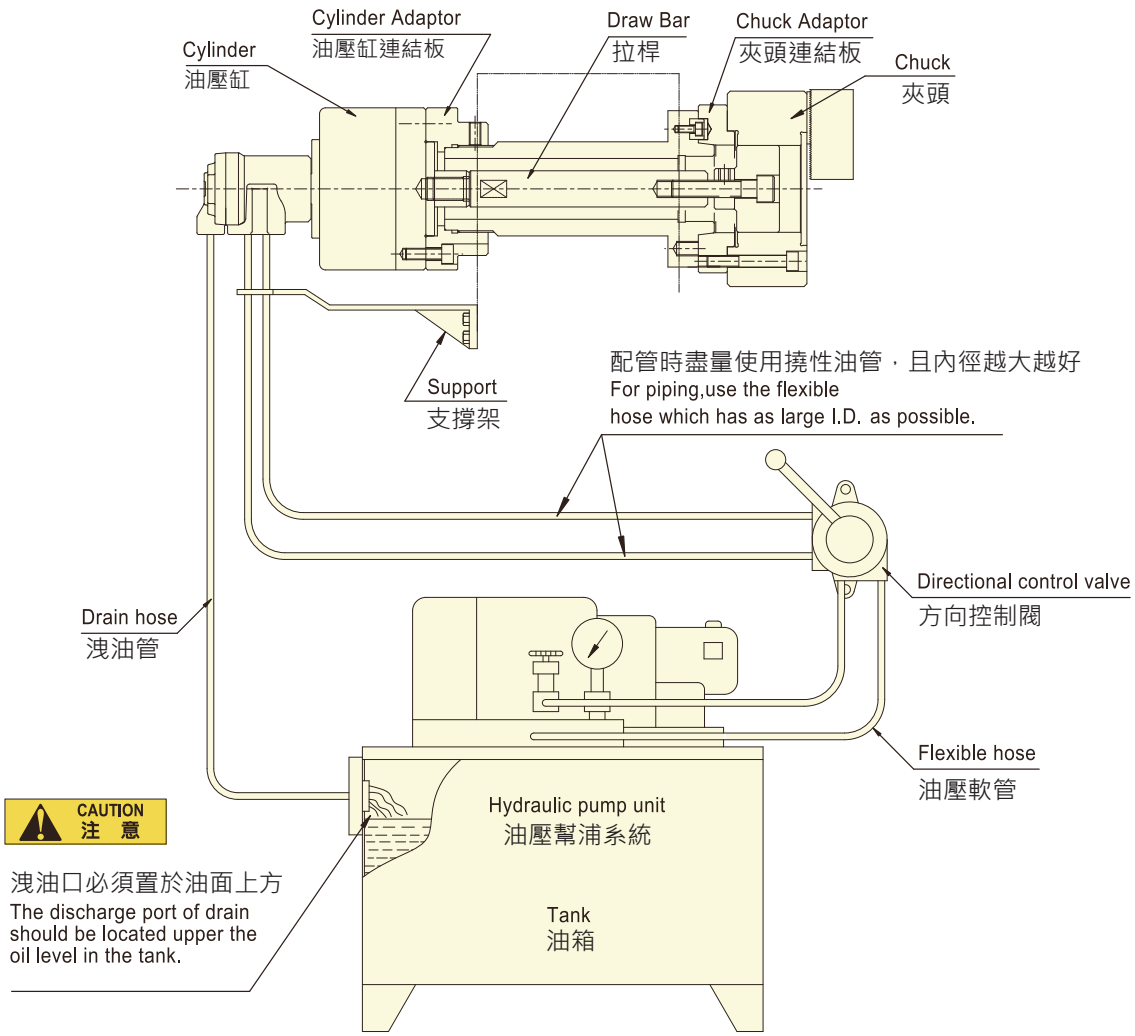



Fig.1

## 3.2 油壓缸連結板的製作及安裝

**IMPORTANT**
**留 意 事 項**

油壓缸連接板之正面及插口內徑之偏轉超過0.005mm 將使油壓缸因震動而縮短使用壽命。

- 確使油壓缸裝置儘量靠近車床主軸支撐處。(參照 Fig.3)
- 確實裝上固定螺絲以防止連結板鬆脫。

## 3.2 Preparation and mounting of cylinder adapter

Keep the run-out on cylinder adapter front face and the run-out on its inside diameter both within 0.005mm, Excessive vibration can cause vibration and markedly shortened cylinder service life.

- Be sure cylinder near the spindle support of the lathe .( Refer to Fig .3)
- Prevent loosening of the adapter remember to provide the set screw.

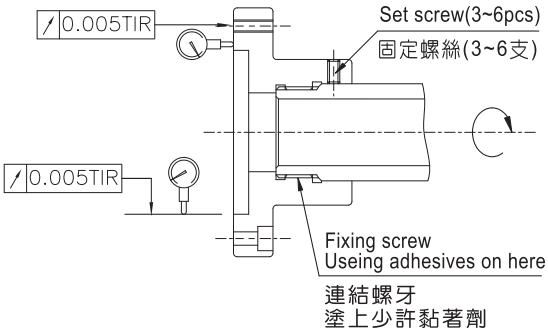



**Fig.2** 油壓缸連結板的偏擺量測
Run-out Measurement of Cylinder Adaptor

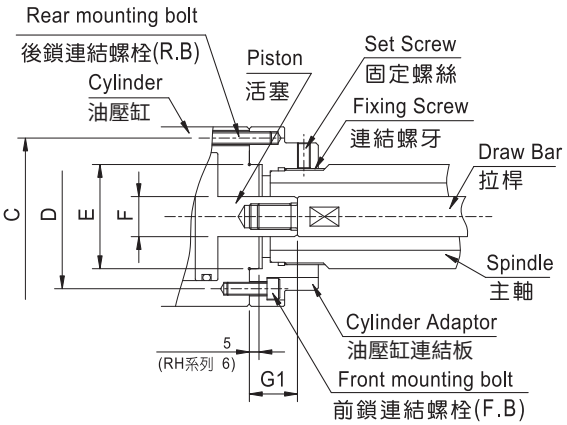



**Fig.3** 油壓缸連結板的安裝
Mounting of Cylinder Adaptor

| 寸法 Dim / 型號 Model | RH-65<br>RS-6520N<br>RS-6530N | RH-80<br>RK-75/RK-75N<br>RS-75/RS-75N<br>RS-7530N<br>RL-75/RL-75N<br>RL-A75N | RH-100<br>RK-100/RK-100N<br>RS-100/RS-100N<br>RS-1030N<br>RL-100/RL-100N<br>RL-A100N | RH-125<br>RK-125/RK-125N<br>RS-125/RS-125N<br>RL-125/RL-125N<br>RL-A125N | RK-150/RK-150N<br>RS-150/RS-150N<br>RL-150/RL-150N<br>RL-A150N | RH-200<br>RK-200/RK-200N<br>RS-200/RS-200N<br>RL-200/RL-200N<br>RL-A200N | RK-250<br>RK-250N |
|---|---|---|---|---|---|---|---|
| C<br>RH 型沒有<br>(RH type nonuse) | 80 | 90 | 115 | 140 | 170 | 220 | 275 |
| D | 80 | 90 | 100 | 130 | 130 | 145 | 220 |
| E(h7) | 60 | 65 | 80 | 110 | 110 | 120 | 160 |
| F | 22(RH-65)<br>25 | 25(RH-80)<br>30 | 25(RH-100)<br>30 | 30(RH-125)<br>35 | 45 | 55 | 65 |
| G1(Max.) | 45 | 45 | 45 | 50 | 55 | 70 | 85 |
| F.Bolt<br>前鎖連結螺栓 | 6~M8 | 6~M8 | 6~M10 | 6~M12 | 12~M12 | 12~M16 | 6~M20 |
| R.Bolt<br>後鎖連結螺栓<br>RH 型沒有<br>(RH type nonuse) | 6~M6 | 6~M8 | 6~M8 | 6~M8 | 6~M10 | 6~M10 | 6~M16 |

## 3.2.1 雙桿型迴轉油壓缸連結板製作及安裝

**IMPORTANT**
**留 意 事 項**

油壓缸連接板之正面及插口內徑之偏轉超過0.005mm 將使油壓缸因震動而縮短使用壽命。

- 確使油壓缸裝置盡量靠近車床主軸支撐處。( 參照 Fig.3.1)
- 確實裝上固定螺絲以防止連結板鬆脫。

## 3.2.1 Preparation and mounting of Doublerod Rotary cylinder

Keep the run-out on cylinder adapter front face and the run-out its inside diameter both within 0.005mm, Excessive vibration can cause vibration and markedly shortened cylinder service life.

- Be sure cylinder near the spindle support of the lathe.( Refer to Fig .3.1)
- Prevent loosening of the adapter remember to provide the set screw.

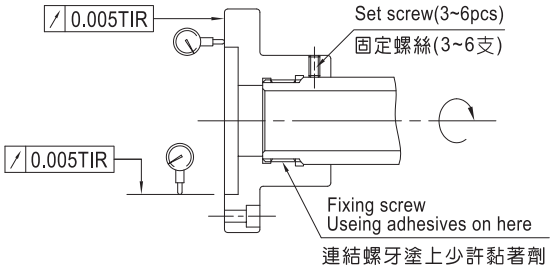



**Fig.2.1** 油壓缸連結板的偏擺量測
Run-out Measurement of Cylinder Adaptor

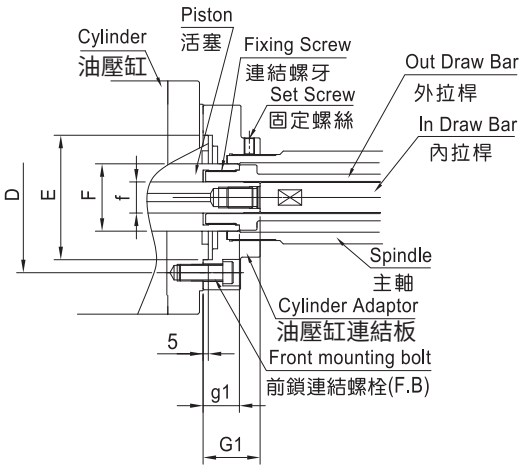


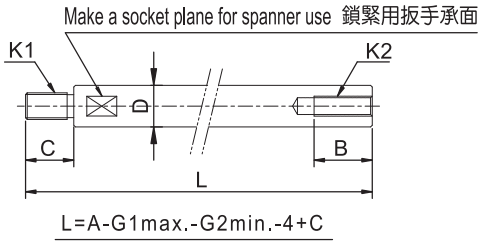

**Fig.3.1** 油壓缸連結板的安裝
Mounting of Cylinder Adaptor

| 型號 Model / 寸法 Dim | RD-120 | RD-125 | RD-120N | RD-125N | RDL-160S |
|---|---|---|---|---|---|
| D | 145 | 145 | 145 | 145 | 180 |
| E(h7) | 110 | 110 | 110 | 110 | 145 |
| F | 29 | 29 | 29 | 29 | 30 |
| f | 50 | 50 | 50 | 50 | 60 |
| G1(Max.) | 60 | 55 | 60 | 55 | 70 |
| g1(Max.) | 35 | 35 | 35 | 35 | 40 |
| F.Bolt 前鎖連結螺栓 | 6~M12 | 6~M12 | 6~M12 | 6~M12 | 6~M12 |

## 3.3 拉桿的製作及安裝

- 參考 Fig.4 及 Fig.5 以決定拉桿長度。
- 使活塞完全伸出外部時再旋入拉桿。

中實拉桿製作
Manufacture of Draw Bar

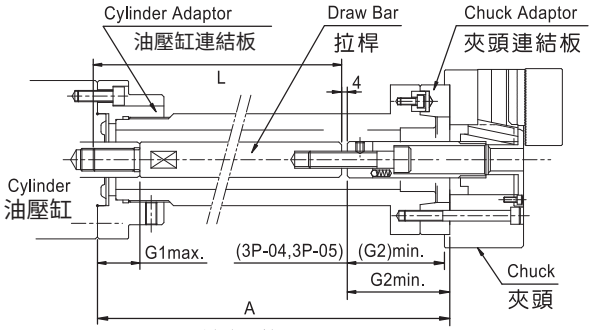



拉桿詳圖
Detail of Draw Bar

Fig.4

## 3.3 Preparation and mounting of draw pipe.

- Refer to Fig.4 and Fig.5 determine the length of draw pipe.
- With the piston rod thoroughly extracted outside, screw the draw pipe into piston rod.




拉桿裝配圖
Mounting of Draw bar

Fig.5

| 油壓缸型號 Cylinder type | 適用夾頭型號 Matching chuck | B | C | D | G1 max. | G2 min. | K1 | K2 | L |
|---|---|---|---|---|---|---|---|---|---|
| RH-80/RK-75(N) | 3P-04 | 30 | 25/30 | 25/30 | 45 | 3 | M16x2/M20x2.5 | M10x1.5 | A-27/A-22 |
| | 3P-05 | 40 | | | | -6 | | M12x1.75 | A-18/A-13 |
| RH-100/RK-100(N) | 3P-06 | 40 | 30 | 30 | 45 | 82.6 | M16x2/M20x2.5 | M16x2 | A-101.6 |
| RH-125/RK-125(N) | 3P-08 | 40 | 40 | 35 | 50 | 106 | M20x2.5/M24x3 | M20x2.5 | A-120 |
| | 3P-10 | | | | | 133 | | | A-147 |
| RK-150(N) | 3P-12 | 40 | 40 | 45 | 55 | 133 | M30x3.5 | M20x2.5 | A-152 |
| RH-200/RK-200(N) | 3P-215 | 60 | 55 | 55 | 70 | 69 | M36x4 | M30x3.5 | A-88 |
| RK-250(N) | 3V-40/3V-50 | 70 | 60 | 65 | 85 | 66 | M42x3 | M36x4 | A-95 |

- 註:RS/ RS-N / RL / RL-N / RL-AN 型式之拉桿長度計算同 RK 型式.
- 依上表求得 A 值(油壓缸連接板至夾頭連接板)之距離,可得知拉桿長度 L。
- 範列:
  在 3P-08、RH-125 配合中, A 值為 800mm,
  拉桿總長 L=A-120=800-120=680mm
- 拉桿與活塞桿之縲紋須相同。

- The calculational methods of RS / RS-N / RL / RL-N / RL-AN type draw bar length is the same as RK type.
- Use the table to find A (between cylinder adapter and back plate) and determine the dimension L..
- Example: Type 3P-08 and RH-125 the distance A is 800mm,so that the overall length of the draw bar will be 680mm. L=A-120=800-120=680mm
- Accurate threading must be provided on the draw pipe in conformity with the threads on the piston rod.

**WARNING 警 告**

拉桿厚度不足而強度不夠引起斷裂,造成夾持力喪失產生危險而導致工件飛出。

Danger by insufficient thickness of draw pipe to secure strength It will cause the gripping force lost. As a result the workpiece discharges.

**IMPORTANT 留 意 事 項**

拉桿振動乃由螺牙鬆動所致。

Vibration of the draw pipe is caused by insecure threads.

## 3.3.1 雙拉桿的製作及安裝(RD/RD-N type)

## 3.3.1 Mounting of Double draw bar(RD/RD-N type)

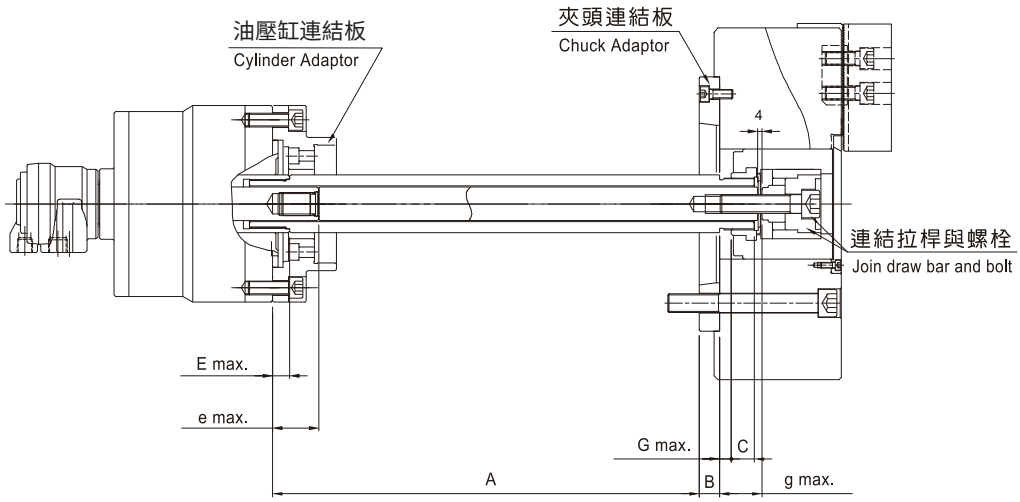
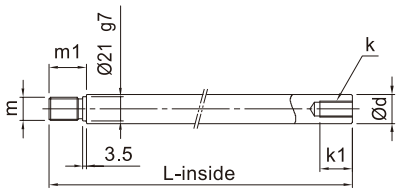



Fig.6

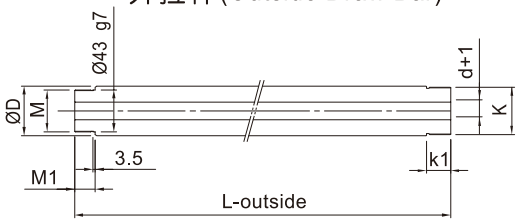
內拉桿(Inside Draw Bar)




L=A+B+g max.+m1-4-e max.

Fig.6.1

外拉桿(Outside Draw Bar)




L=A+B+G max.+C+M1-E max.

Fig.6.2

| 油壓缸型號 Cylinder type | 適用夾頭型號 Matching chuck | m | M1 | k | k1 | Ød | e max. | g max. | L-inside |
|---|---|---|---|---|---|---|---|---|---|
| RD-120/RD-120N | 4T-12 | M20x2.5 | 33 | M16x2 | 35 | 30 | 60 | 36.5 | A+B+5.5 |
| RD-125/RD-125N | 4T-12 | M20x2.5 | 33 | M16x2 | 35 | 30 | 55 | 36.5 | A+B+10.5 |

Fig.6.1

| 油壓缸型號 Cylinder type | 適用夾頭型號 Matching chuck | M | M1 | K | K1 | C | D | E max. | G max. | L-outside |
|---|---|---|---|---|---|---|---|---|---|---|
| RD-120/RD-120N | 4T-12 | M42x.1.5 | 35 | M45x1.5 | 23 | 20 | 50 | 35 | 10 | A+B+30 |
| RD-125/RD-125N | 4T-12 | M42x1.5 | 35 | M45x1.5 | 23 | 20 | 50 | 35 | 10 | A+B+30 |

Fig.6.2

**IMPORTANT**
**留 意 事 項**

註：

(1) 請先安裝外拉桿,再安裝內拉桿。

(2) 安裝外拉桿前,請先卸下連接拉桿與螺栓。

- 螺牙鬆動是造成振動的主要原因。
- 以抗拉強度 380MPa(38kg/mm$^2$) 以上之材料製作拉桿。

Note:

(1) Please install Outside Draw Bar first, then install Inside Draw Bar.

(2) Before installing the Draw Bar, unload join draw bar and bolt first.

- Insecure threads will cause the draw pipe to vibrate.
- For pipe strength, use the material of tensile strength 380MPa (38kg/mm$^2$) of or more.

## 3.3.1 Mounting of Double draw bar(RDL type)

## 3.3.2 雙拉桿的製作及安裝 (RDL type)

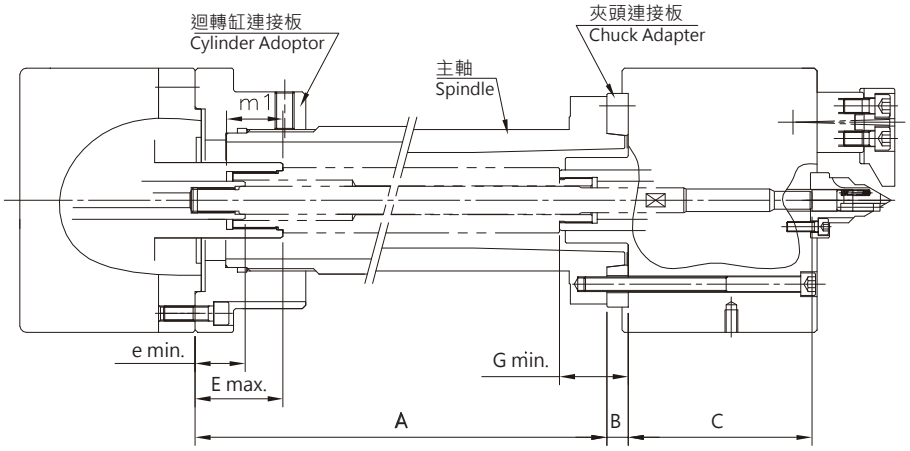
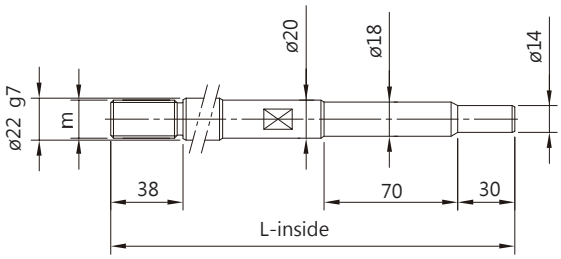



Fig.7

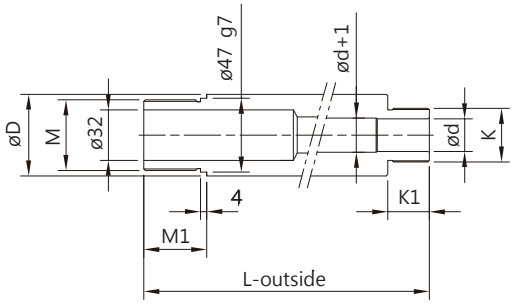
內拉桿(Inside Draw Bar)




L=A+B+C-e min.+m1

Fig.7.1

外拉桿(Outside Draw Bar)




L=A+B-E max. +M1-G min. +K1

Fig.7.2

| 油壓缸型號 Cylinder type | 適用夾頭型號 Matching chuck | m | m1 | C | e min. | L-inside |
|---|---|---|---|---|---|---|
| RDL-160S | 3RF-08 | M20x2.5 | 43 | 146 | 40 | A+B+149 |

Fig.7.1

| 油壓缸型號 Cylinder type | 適用夾頭型號 Matching chuck | M | M1 | Ød | Ø D | K | K1 | E max. | G Min. | L-outside |
|---|---|---|---|---|---|---|---|---|---|---|
| RDL-160S | 3RF-08 | M45x.1.5 | 40 | 22 | 52 | M36x1.5 | 26 | 70 | 54.5 | A+B-58.5 |

Fig.7.2

**IMPORTANT**
**留 意 事 項**

註：

(1) 請先安裝外拉桿,再安裝內拉桿。

(2) 安裝外拉桿前,請先卸下連接拉桿與螺栓。

- 螺牙鬆動是造成振動的主要原因。
- 以抗拉強度 380MPa(38kg/mm$^2$) 以上之材料製作拉桿。

Note:

(1) Please install Outside Draw Bar first, then install Inside Draw Bar.

(2) Before installing the Draw Bar, unload join draw bar and bolt first.

- Insecure threads will cause the draw pipe to vibrate.
- For pipe strength, use the material of tensile strength 380MPa (38kg/mm$^2$) of or more.

## 3.4 安裝油壓缸

## 3.4 Mounting of cylinder

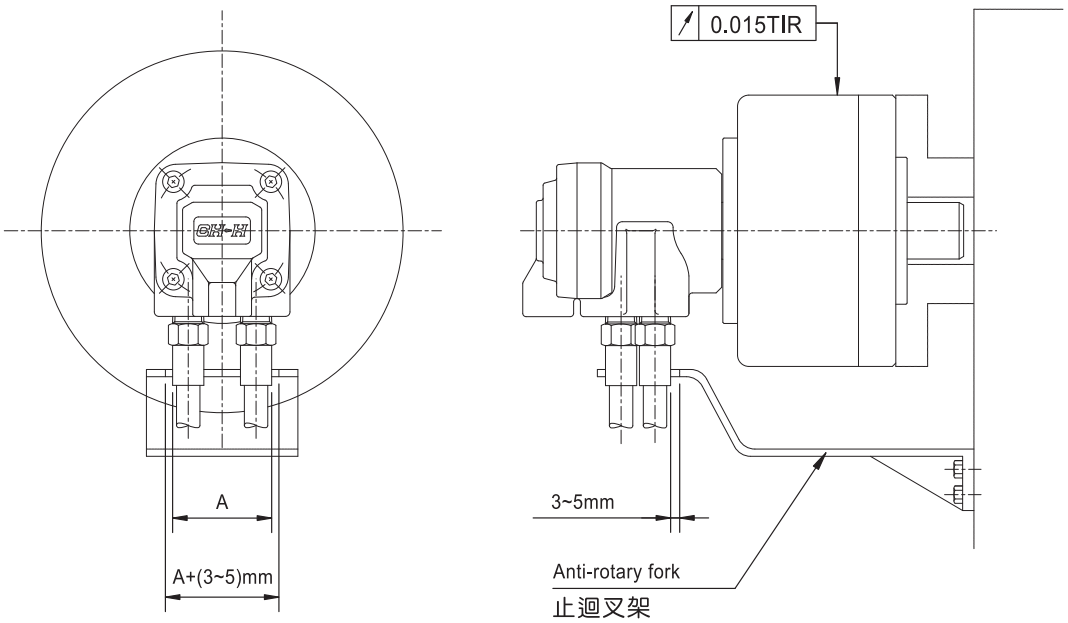
**IMPORTANT**
**留 意 事 項**

為防止油壓缸罩殼之旋轉發生，以洩油口底部突起處安裝一支撐架。

- 支撐架安裝於車床，應使閥體之突出部位與其有一定之閒隙方不致於承受其他外力。
- 安裝油壓缸須轉動主軸，檢查油壓缸前端及後端之偏擺 ( 參照 Fig.8)

In order to prevent the rotation of the cylinder sleeve body, provide a support utilizing the projections on the drain port base.

- After the support is mounted to the lathe, relain the clearance between the projected part of the Valve Housing and the support so that the Valve Housing will not be subjected to loading.(Refer to Fig.6)
- When mounting the cylinder, chek run-out on its circumference and on either upper or lower surface of the sleeve cover while rotating of spindle.(Refer to Fig.8)




止迴叉架圖及油壓缸安裝後的偏擺

Fig. 6 Anti-rotary fork and Run-out of cylinder after mounting

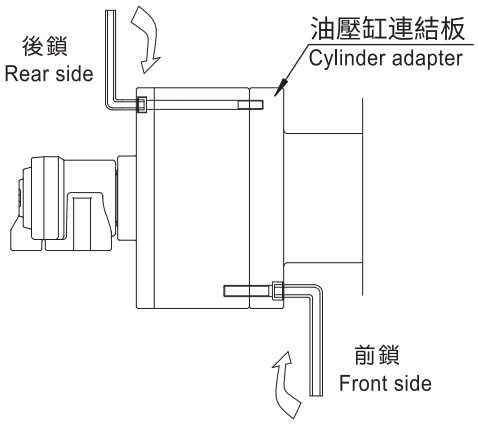
**Fig.8**

為合乎上列數值，油壓缸連結板前端之偏擺應小於 0.005 TIR 。

In order to obtain the required value shown above, run-out on cylinder adapter front face should be 0.005TIR or less.

## 3.5 安裝油壓缸的正確方式及鎖緊力矩

油壓缸安裝於連接板其固定螺絲應越深越好，如下圖所示。




## 3.5 Use correct method and tightening torque to mounting cylinder.

When mounting a cylinder on the cylinder adapter screw as deep as illustrated below.

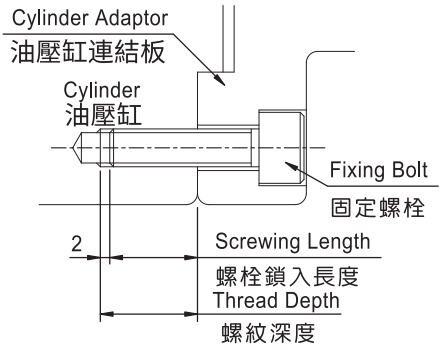



Fig.9

螺紋鎖入長度須距離油壓缸螺紋深度約 2mm 。

Screwing length of the bolt should be the screw tapped length minus 2mm.

**WARNING 警 告**

- 依下表力矩而鎖緊螺絲。

後鎖側的場合 (RH 型、 RD 型沒有)
Rear side (RH、RD type nonuse)

| 螺絲規格 Bolt size | 鎖緊力矩 Tightening torque |
|---|---|
| M8 | 38.2 N・m (3.9 kgf・m) |
| M10 | 72.6 N・m (7.4 kgf・m) |

- 由於油壓缸為鋁與合金材料，故其鎖緊力矩約為夾頭同規格螺絲鎖緊力矩之 80% 。

- Tighten the mounting bolts comforming to each torque specified as follows.

前鎖側的場合
Front side

| 螺絲規格 Bolt size | 鎖緊力矩 Tightening torque |
|---|---|
| M8 | 31.5 N・m (3.2 kgf・m) |
| M10 | 60.0 N・m (6.1 kgf・m) |
| M12 | 87.0 N・m (8.9 kgf・m) |
| M16 | 205.0 N・m (20.9 kgf・m) |

- Each torque values above is shown with a tightening torque at 80% of hydraulic pressure chuck bolts because the cylinder is made of aluminum.

## 4. 油壓迴路之設計

油壓迴路的設計是基於操作簡便和安全的原則，提供安全迴路，以防止停電時所產生的危險。(Fig.8)

- AUTOGRIP 油壓缸之油壓迴路含有自鎖機構工作進行時，發生停電或壓力源故障所產生的壓力異常降低時，安全閥產生效用，將夾持力維持固定狀態讓工件不致飛出而產生危險。(R_-_N 型除外 )

**DANGER 危 險**

- 如採4 口2 位電磁閥設計油壓缸之切換作用，迴路則須設計成在脫磁狀態時，工件仍能被夾持。(Fig.8)

**CAUTION 注 意**

- 防止由內徑夾持切換至外徑夾持之錯誤操作，須提供一個 4 口 2 位電磁閥來保持固定其位置。(Fig.10)

**IMPORTANT 留 意 事 項**

- 洩油管之內徑須符合油壓缸排油管之外徑，當管徑變小時，則油路阻抗增大，油缸作動速度變慢。

## 4. Design the Oil circuit

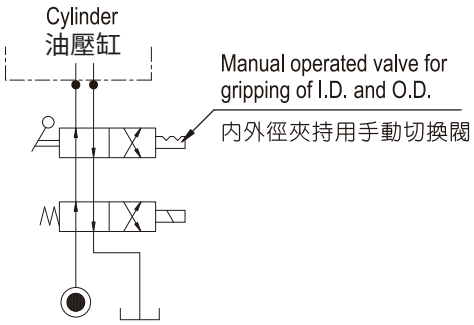
Design the hydraulic operation circuit so that it is easily operated and mis-operation does not occur. Provide the fail-safe circuiting so that the accident does not occur even if the power source is interrupted. (Fig.8)

- The unit is incorporating the locking mechanism which works to retain the specified gripping force even when the abnormal drop of the supplied pressure is cavsed by power failure or breakdown of pressure source during the work machining.(except R_ -_N type)

- In order to make the change-over of cylinder by use of the 4-port 2-position solenoid valve, the hydraulic circuit should be so designed as to grip the work when solenoid controlled is demagnetized. (Fig.8)

- Provide the inner dia./outer dia. gripping change valve in order to prevent mis-operation when changing from the inner dia. gripping to outer dia. When the solenoid valve is used for this chang valve. use the 4-port 2-position valve with position stop. The designation circuit is to be maintained.(Fig.10)

- Select the bore dia. of operation eguipment which corresponds to the piping bore dia. of cylinder. The piping resistance increases as the diameter becomes small and speed is slow.




四口二位切換閥
4-ports 2-positions controlled valve

Fig.10

## 5. 安裝控制閥油壓系統及配管

- 將手動控制閥安置於方便操作處。
- 油壓系統儘量安裝於靠近油壓缸附近，使其洩油管能夠盡量保持平直垂下，而壓力表指針需很容易的被清楚看見。
- 盡量使用內徑大之油管。

**CAUTION**
**注 意**

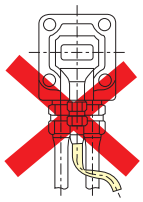
- 安裝前油管內部之雜物灰塵應完全清出，否則將導至油壓缸迴轉閥部位因過熱咬死而產生危險。
- 可於迴轉油壓缸安裝前，先將兩條給油管互相接通，使其循環過濾掉油管內的雜屑後再安裝迴轉油壓缸。
- 在安裝 RL、RL-A（注水型與注氣型）迴轉油壓缸時，亦需特別注意空氣與切削液的品質與清潔，請於給氣與給水端加裝小於 20 μ m 之濾網，並依使用狀況至少每兩個月清洗或更換濾網一次。無空氣與切削液通過時，請勿運轉。空轉易造成零件乾磨而損壞。
- 中實型等各型式的迴轉油壓缸，在迴轉部位裝有油封，如果配置洩油管不當，有如下列圖示之情況時，則會產生較大的背壓，這將是導致油壓缸漏油的最主要原因，故在配管時應特別注意，避免發生這些情況。
- 洩油孔允許最大背壓為 0.15Kgf/cm$^2$，洩油管最大高度為相對於油壓缸中心上方 1.7m 。

## 5. Attachment of control valve, hydraulic unit and piping.

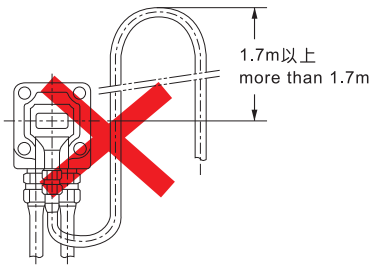
- Attach the manual operated valve in the place convenient to handle on the machine.
- Install the hydraulic unit in the place close to the hydraulic cylinder, where the drain hose can be kept straightened and where the pressure gage dial can be clearly observed.
- Use the pipe which has as large I.D. as possible.

- Remove any dirt throughly from inside of the pipe, and then install it, dirt in the cylinder can be a cause of cylinder overheating.
- Connect the two oil pipe before install the rotary hydraulic cylinder, make circulation to filter miscellaneous bits of the oil pipe and then install the rotary hydraulic cylinder.
- Installing RL, RL-A (coolant connection and air connection) rotary hydraulic cylinder, need to pay special attention to the quality and clean of the air and cut liquid, please on supply air and supply water end install additional the filter screen to smaller than 20 μ m, and clean or change filter screen once every two month at least in accordance with use state. Please don't operate if there is no air or cutting fluid through passing. Idling may easily cause damage to parts.
- Each model of closed center rotary hydraulic cylinder has oil seal in rotary section, if not well installed the drain hose, it will produce bigger back pressure as following drawing shows, that will be the main reason of oil leaking on cylinder, you have to pay more attention while piping in order to avoid such situation happened.
- The allowable back pressure on the drain port is 0.15Kgf/cm$^2$max. and therefore, the maximum allowable height of the drain hose relative to the cylinder center is approximately 1.7m.

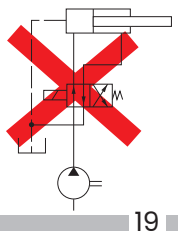
● 洩油管扭曲。
● Drain hose is tortured.



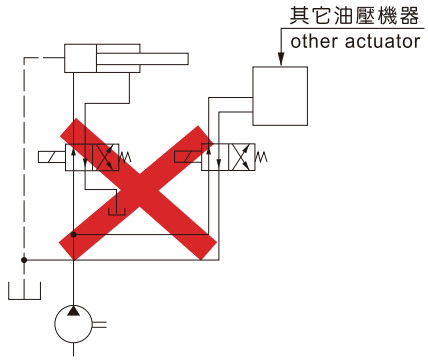
● 洩油管懸掛高於油壓缸中心線1.7m以上。
● Drain hose is hanged up more than 1.7m from the center line of distributor.



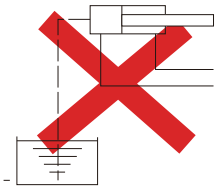

● 回油管和洩油管連接在一起。
● Return port and drain port are connected.



- 其它油壓機器的回油管和洩油管連線在一起。
- The hydraul ic circuit of the other actuator is connected to the drain hose.




- 洩油管末端沈入水面下。
- The e n d of drain hose is sunk in the tank of hydraulic unit.



**IMPORTANT**
**留 意 事 項**

- 油壓缸配管必須使用撓性油管，可防止因彎曲及張力而影響油壓缸之作動。
- 使用於油壓油的幫浦必須至少有 20L/min 的流出量，然而油壓壓力的控制必需由幫浦的控制裝置或減壓閥分開來控制。

- Be sure to use the flexible hose for piping to the cylinder so that the bending force and tensile force are not applied to the cylinder.
- For hydraulic oil supply, the variable capacity type pump which has the discharge capacity or 20 liters/min or more is used. Oil pressure is set with pump's own control device or a reduction valve which is provided separately from the system.

## 6. 油壓油

- 為了確保油壓缸之適用性，建議使用黏性 30~50cSt（溫度 40° C）之油壓油（相當於 ISO VG32 和 VG46）

**IMPORTANT**
**留 意 事 項**

- 油壓油應具有抗磨損及不起泡等性質，且供給油路中應有 20 μ m 之濾網。
- 油壓缸之溫度，洩油量及作動速度受油之品質所影響，應依幫浦之使用說明來調整油壓油。

## 6.Hydraulic oil

- For satisfactory operation of the cylinder it is recommended to use the hydraulic oil whose viscosity is 30~50cSt at a temperature of 40° C. (equipvalent to ISO VG32 and VG46)

- The hydraulic oil should have anti-abrasive and anti-foaming characteristic. In order to retain good performance of the cylinder, be sure to include the filter of 20 μ m in the pressure supply system.
- Since hydraulic oil is influenced to the cylinder meating, drain volume and operation speed, regulate the oil according to the instruction manual of the pump unit.

## 7. 操作測試

(1) 確認電壓為指定值。

(2) 測試時壓力調整把手開到最小並迅速切換開關以檢查幫浦旋轉方向是否正確，如運轉方向相反，關掉電源並換接電源線中之兩條電線後，重復檢測無誤後，始可全速運轉。

(3) 油壓力設定以能使夾頭作動之最低壓(0.35~0.5MPa) 接著依下列程序檢查。

- 檢查夾頭作動是否順暢。
- 夾爪開合的動作方向是否正確。
- 夾爪的行程是否足夠。
- 有無漏油現象。

依上述事項檢查正確後，緩慢的增加壓力直至所需的壓力值，再檢查一次，同時查看洩油管的排油是否順暢。

(4) 主軸轉速設定於最低，若運轉正常，增加轉速並檢查油壓缸之偏擺狀況及支撐處及管路有無異常。若產生震動則檢查油壓缸連接板之偏擺狀況。

(5) 如油溫不高 (介於 20 至 30° C) 以最高轉速之 1/3 來熱機。

## 7.Test Run

(1) Confirm the voltage is as specified.

(2) During the test run. set te pressure adjustment handle at the minimum level and check the direction of pump rotation by inching (putting the switch on and off briefly in alternation). If the pump is rotated in reverse direction, turn power source off. Reverse two of three powerwises. After checking the direction of rotation, to operate at maximum speed.

(3) After lowering the chucking pressure to the minimum pressure, set the pressure to the low pressure which can chuck (0.35~0.5MPa) and check the following steps.

- Check the chuck operation is smooth.
- Check the chucking direction is corect (chuck clamp and unclamp directions)
- Chuck the operation stroke is adequate (chuck jaw stroke)
- Check the oil leakage is not found on each piping.

When the above procedures are correct, slowly raise the operation pressure to the rated pressure, rechecking the above steps. At this time, check that the drain smoothly flows.

(4) Rotate the lathe spindle at a minimum revolution and slowly raise the revolution unless there is the run-out of cylinder and fault of supporter or piping. If the rotary vibration is extreme, it is recheck the run-out of adapter.

(5) In case of the oil temperature is low (below 20~30°C), make the run-in operation at the rotational speed of approx. 1/3 of max. speed.

**CAUTION**
**注 意**

- 當機器長時間持續運轉，而沒有做油壓缸切換操作動作或主軸皮帶輪發熱，或油壓缸周圍存在著特別熱源，其內部的鎖緊機構 (R_-_N 型除外 ) 將使油壓缸因溫度突然上昇導至內部壓力上昇，而無法正常操作，這些問題在試車時特別容易發生，所以必須經常使活塞做反覆運動。

- When the ambient temperature of cylinder rises suddenly, i.e., When the machine is continuously operated for long hours without changing operation or with heat generation of main shaft pulley occurring or special heat source exists around the cylinder, the sealed pressure into the cylinder rises because of a built-in locking mechanism(except R_ -_N type), thereby causing cylinder malfunction. Especially, during running-in, this trouble is apt to occur. Therefore, frequently make reciprocating motions of the piston.

當油壓缸的運轉逐漸變得不正常，請採取下列步驟：

(1) 停止運轉。

(2) 旋轉油壓系統中控制夾頭壓力設定之減壓把手，增加約 0.5MPa 之壓力，其次重覆切換開關以測試油壓缸之運動。

(3) 如運轉仍不正常，增加夾頭之預設壓力每次約 0.5MPa ，再重覆步驟 (2) ，但增加的預設壓力不可超過最大壓力之 30% 。當一切回復正常時，將預設壓力調回正常值。

(4) 如步驟 (3) 已重覆多次並使預設壓力達到最大值亦無法正常，則將壓力回復正常值，關掉電源，待油壓缸之溫度降回室溫時再重覆步驟 (2) 、( 3) 。可用風槍或類似裝置降低油壓缸之溫度。

(5) 降溫後仍無法正常運轉，鬆開夾頭端的連接螺帽，拆下連結部份以檢視油壓缸之作動是否正常。

(6) RL、RL-N 注水型迴轉油壓缸使用時，必須遵守 PV 限制值 14400 Mpa r/m，以維護注水閥的使用壽命，並注意無流體通過時，請勿運轉。

When the cylinder becomes inoperative, operate the machine with the following steps for normal operation as well as test run:

(1) Stop the spindle.

(2) Turn the pressure adjustment handle of reducing valve provided on the hydraulic unit for the purpose of chuck pressure setting (cylinder pressure setting), and raise the pre-set chuck pressure by approx. 0.5MPa. Then make the repeated change-over of the cylinder operation change-over switch to confirm cylinder motion.

(3) If the cylinder remains inoperative, gradually increase the pre-set chuck pressure (by approx. 0.5MPa each) and repeat the same procedures as described in above (2) for confirmation of cylinder motion. At this time, upper limit of pressure is added by 30% of maxmum chuck pressure. when the cylinder operation is recovered, bring back the pre-set chuck pressure to the normal level.

(4) When the normal cylinder operation can not be recovered despite that the pre-set chuck pressure is brought up to maximum value and that the operations described in above (3) are made several times, bring the pre-set chuck pressure down to the normal level and turn off the power. Then let it cool down until the cylinder surface temperature becomes nearly the same as room temperature, and repeat the procedures stated in (2) and (3) above to check the cylinder motion. The cylinder can be cooled faster by blowing air on the cylinder with an air gun or equivalent.

(5) When the cylinder operation never recovers even after it is cooled, loosen the draw-nut of the chuck side and take off the connection for confirmation of cylinder motion.

(6) When use RL, RL-N rotary hydraulic cylinder with coolant connection that must observe the PV limit value 14400 Mpa r/m, which in order to maintain the use life of the coolant valve, and pay attention please don't operate when not having fluids that are passed .

# 8. 近接開關

## 8.1 近接開關規格

- 近接開關使用 IFS287(IFM)，如需它種廠牌，請聯絡我們。

# 8. Proximity Switch

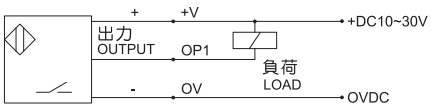
## 8.1 Proximity Switch Specifications

- The proximity switch is of a standard IFS287(IFM), and if requiring other types, please contact us.

| 型式 Model / 規格 Spec. | NBB4-12GM50-E0-5M |
|---|---|
| 電壓 Power supply | DC 10/30V |
| 負荷容量 Switching cap. | 100mA |
| 輸出規格 Output tpye | NPN |

端子接線TERMINAL CONNECTIONS

| 型式 Model / 符號 Mark | NBB4-12GM50-E0-5M | |
|---|---|---|
| +V | 棕 | BROWN |
| OP1 | 黑 | BLACK |
| OV | 藍 | BLUE |



## 8.2 近接開關的位置調整

- 近接開關安裝於行控盒之檢出調整板上，其感應端和檢出環外徑保持 1-4mm 距離，並藉由調整板之滑動以調整其軸向位置。

## 8.2 Adjusting the Position of a Proximity Switch

- The proximity switch is mounted to the outside of a casing through the adjusting plate and must be set with the screws of the proximity switch and the adjusting plate so that the distance between the end of a detectable plate is approx. 1-4 mm. The adjustment to the axial direction is done by sliding the adjusting plate.

## 9. 維護及檢查

- 當因漏油而須拆解油壓缸清洗和更換 O 型環時應很小心，因其一部份乃是由輕合金製造。

**油壓系統**

- 吸油口過濾網每隔 2~3 月清洗一次。
- 油壓油每半年檢查一次，如已變質即行更換。

WARNING
警 告

- 以最大油壓力及最高轉速操作時每 25 萬次分解內部零件，更換油封檢查各零件。
- 油壓缸之作動不良、損壞乃因突壓過大，以節流閥來降低其壓力。
- 每星期檢查斷電時之安全裝置，以夾持一工件後關掉電源查看夾持情形，假若能完全夾緊，表示安全裝置能有效運作，相反則否，如此請立刻與你的經銷商連絡，給予修理服務。

## 9.Maintenance and inspection

- When the oil leakage observed, disassemble the cylinder for cleaning and replacement of O-ring. At the time, handle the cylinder with care as it partly uses the ligh alloy.

**Hydraulic Unit**

- Clean the suction strainer in every 2~3 months.
- Check the hydraulic oil in every half year and replace it if it is deteriorated.

- When operating the machine with maximum hydraulic pressure and maximum speed, disassemble it at every 250 thousands of use and replace the seal and inspect each component.
- When surge pressure is greatly applied, thereby causing cylinder faiure and damage. Therefore, adjust the throttle valve to reduce the surge pressure.
- The safety device for power failure should be checked once a week. The checking procedure is to grip a workpiece first, then turn off the power. Inspect the gripping condition of the workpiece. If the workpiece is clamped tightly, it indicates the safety device works effectively. Otherwise, the safety function fails. Please call your local dirstributor for repair service.

## 10. 故障排除

**活塞不作動**

- 由撓性油管中確認油壓系統處於運轉中。
- 確認所有管路皆連接正確。
- 依循操作測試步驟來修正活塞之不作動。

**油壓缸推力不足**

- 裝置一個壓力計於油壓缸之給油入口處以確認其壓力是否達到正常值。
- 如在油路回歸測之壓力太高或洩油量多於正常值，可能為 O 型環損壞所致。

**溫度上昇**

- 確認油壓油之黏度是否合乎標準。
- 如油箱之油量不足須再補充。
- 如油箱的周遭溫度太高而造成油箱散熱不良時，請使用冷卻裝置或風扇來控制油溫。

**泵之噪音**

- 避免空氣進入。
- 如油箱之油量不足須再補充。
- 油箱堆積過多之雜質或油壓油之品質已惡化，可能是油壓泵有不正常之磨損，須立即修理或更換。

## 10.Troubleshooting

**Inoperative Piston**

- Confirm from the motion of the flexible hose that the hydraulic pressure is working.
- Confirm that the piping is correctly arranged.
- Follow the procedures described under Test Run to correct the inoperative piston.

**Insufficient Cylinder Propulsive Force**

- Apply the pressure gauge near the entrance of the cylinder and confirm that the pressure in the cylinder pipe entrance conforms to the specified value.
- If the pressure of piping at return side is high or drain flow is more than a normal condition, it is considerd that the inside 0-ring is worn.

**Temperature Rise**

- Confirm the viscosity of the hydraulic oil is correct.
- Replenish the hydraulic oil if in the tank it has decreased.
- High room temperature will cause the temperature of the tank to rise. Use a cooler or fans to control the temperature.

**Pump Noise**

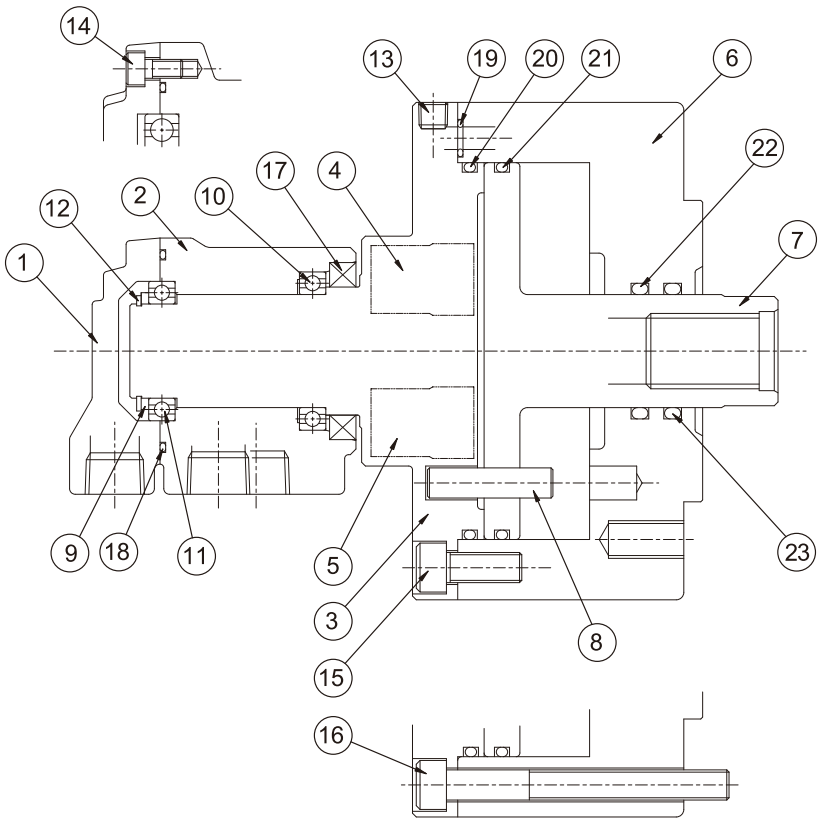
- Avoid suctioning of air.
- Replenish the hydraulic oil if it has decreased.
- When considerable dirt is deposited inside of the hydraulic tank or when the hydraulic oil has deteriorated, it is probable that the pump has been abnormally worn out, needing repair or replace.

# 11. 迴轉油壓缸零件分解圖

## 11.1 RK 型零件分解圖

# 11.Parts list of cylinder

## 11.1 RK type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 閥蓋 | Rear Cover | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 自鎖閥 | Check Valve | 2 |
| 5 | 洩壓閥 | Relief Valve | 2 |
| 6 | 油壓缸體 | Cylinder Body | 1 |
| 7 | 活塞 | Piston | 1 |
| 8 | 止迴銷 | Guide Pin | 2 |

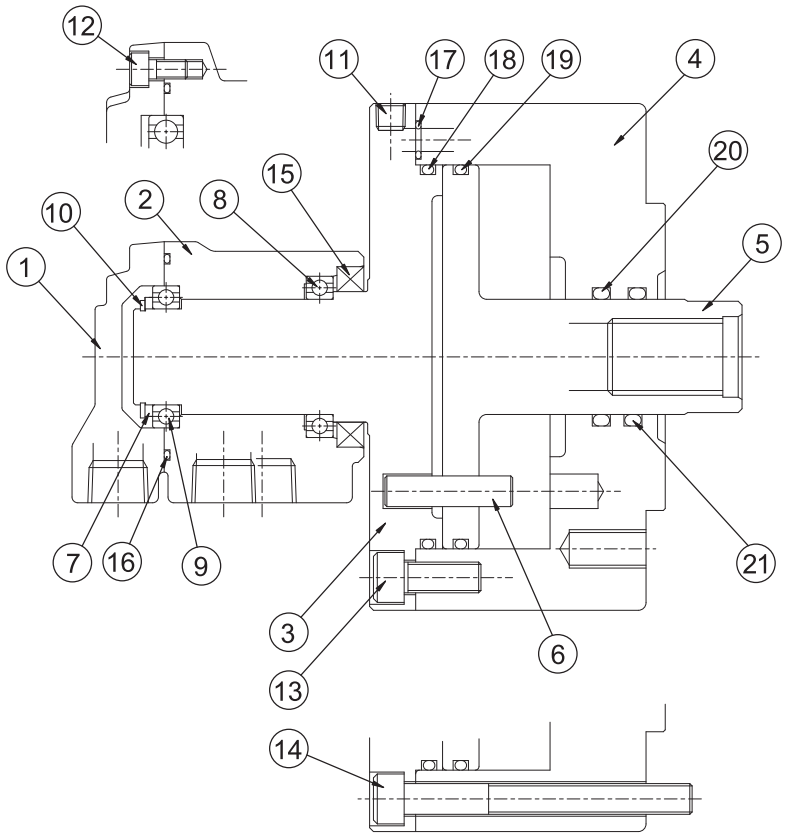
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 9 | 墊圈 | Washer | 1 |
| 10 | 球軸承 | Bearing | 1 |
| 11 | 球軸承 | Bearing | 1 |
| 12 | C 型扣環 | Snap Ring | 1 |
| 13 | 斜管牙管塞 | Plug Screw | 1 |
| 14 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 15 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 or 12 |
| 16 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RK-75 | RK-100 | RK-125 | RK-150 | RK-200 | RK-250 | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|---|
| 17 | 油封 | Oil Seal | TC34477 | TC34507 | | | | TC50658 | 1 |
| 18 | O 型環 | O-Ring | S50 | S55 | | | | | 1 |
| 19 | O 型環 | O-Ring | P7 | | | | P9 | | 2 |
| 20 | O 型環 | O-Ring | G70 | G95 | G120 | G145 | AS568-264 | AS568-273 | 1 |
| 21 | O 型環 | O-Ring | G70 | G95 | P115 | P140 | G190 | P230 | 1 |
| 22 | O 型環 | O-Ring | P30 | P30 | P35 | P45 | P55 | USH65 | 1 |
| 23 | O 型環 | O-Ring(RK-125) | - | | | | | DSI65 | 1 |

## 11.2 RK-N 型零件分解圖

## 11.2 RK-N type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 閥蓋 | Rear Cover | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 油壓缸體 | Cylinder Body | 1 |
| 5 | 活塞 | Piston | 1 |
| 6 | 止迴銷 | Guide Pin | 2 |
| 7 | 墊圈 | Washer | 1 |

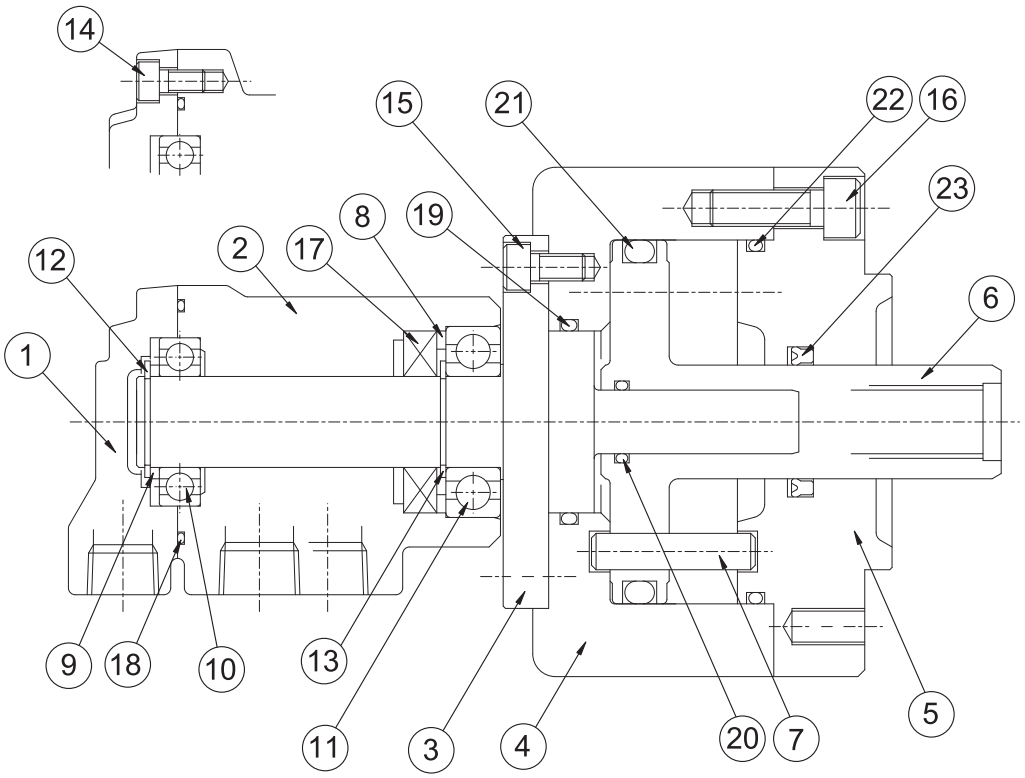
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 8 | 球軸承 | Bearing | 1 |
| 9 | 球軸承 | Bearing | 1 |
| 10 | C 型扣環 | Snap Ring | 1 |
| 11 | 斜管牙管塞 | Plug Screw | 2 |
| 12 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 13 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 or 12 |
| 14 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RK-75N | RK-100N | RK-125N | RK-150N | RK-200N | RK-250N | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|---|
| 15 | 油封 | Oil Seal | TC34477 | TC34507 | | | | TC50658 | 1 |
| 16 | O 型環 | O-Ring | S50 | S55 | | | | | 1 |
| 17 | O 型環 | O-Ring | P7 | | | | P9 | | 2 |
| 18 | O 型環 | O-Ring | G70 | G95 | G120 | G145 | AS568-264 | AS568-273 | 1 |
| 19 | O 型環 | O-Ring | G70 | G95 | P115 | P140 | G190 | P230 | 1 |
| 20 | O 型環 | O-Ring | P30 | P30 | P35 | P45 | P55 | USH65 | 1 |
| 21 | O 型環 | O-Ring(RK-125N) | - | | | | | DSI65 | 1 |

## 11.3 RH 型零件分解圖

## 11.3 RH type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 閥蓋 | Rear Cover | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 油壓缸體 | Cylinder Body | 1 |
| 5 | 油壓缸蓋 | Cylinder Cover | 1 |
| 6 | 活塞 | Piston | 1 |
| 7 | 止迴銷 | Guide Pin | 2 |
| 8 | 大墊圈 | Washer | 1 |

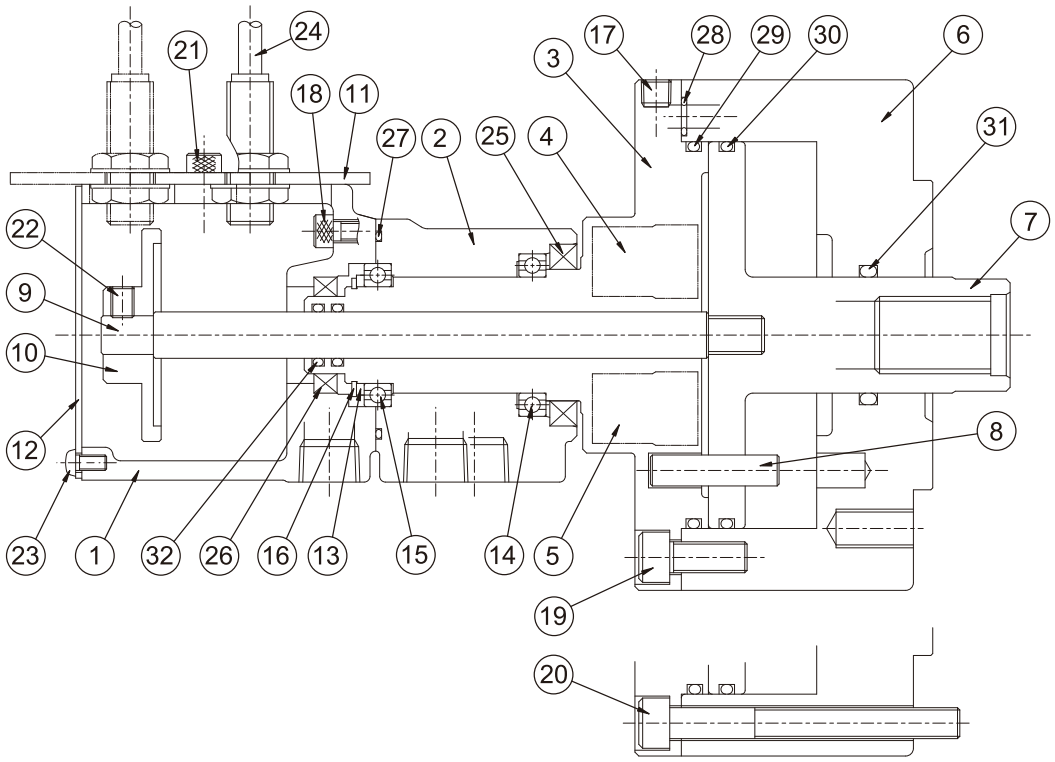
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 9 | 小墊圈 | Washer | 1 |
| 10 | 球軸承 | Bearing | 1 |
| 11 | 球軸承 | Bearing | 1 |
| 12 | C 型扣環 | Snap Ring | 1 |
| 13 | C 型扣環 | Snap Ring | 1 |
| 14 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 15 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |
| 16 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 or 12 or16 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RH-65 | RH-80 | RH-100 | RH-125 | RH-200 | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|
| 17 | 油封 | Oil Seal | TC20407 | | | | TC25407 | 1 |
| 18 | O 型環 | O-Ring | S50 | | | | | 1 |
| 19 | O 型環 | O-Ring | G40 | | | | G45 | 1 |
| 20 | O 型環 | O-Ring | P14 | | | | P25 | 1 |
| 21 | O 型環 | O-Ring | P55 | P70 | P90 | P115 | P185 | 1 |
| 22 | O 型環 | O-Ring | G60 | G75 | G95 | G120 | AS568-264 | 1 |
| 23 | U 型環 | U-Ring | USH22 | USH25 | USH25 | USH30 | USH55 | 1 |

## 11.4 RS 型零件分解圖

## 11.4 RS type parts list




## 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 行控盒 | Case | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 自鎖閥 | Check Valve | 2 |
| 5 | 洩壓閥 | Relief Valve | 2 |
| 6 | 油壓缸體 | Cylinder Body | 1 |
| 7 | 活塞 | Piston | 1 |
| 8 | 止迴銷 | Guide Pin | 2 |
| 9 | 感應心軸 | Sensor Bar | 1 |
| 10 | 檢出環 | Detectable ring | 1 |
| 11 | 檢出調整座板 | Adjusting plate | 2 |
| 12 | 後蓋板 | Cover | 1 |

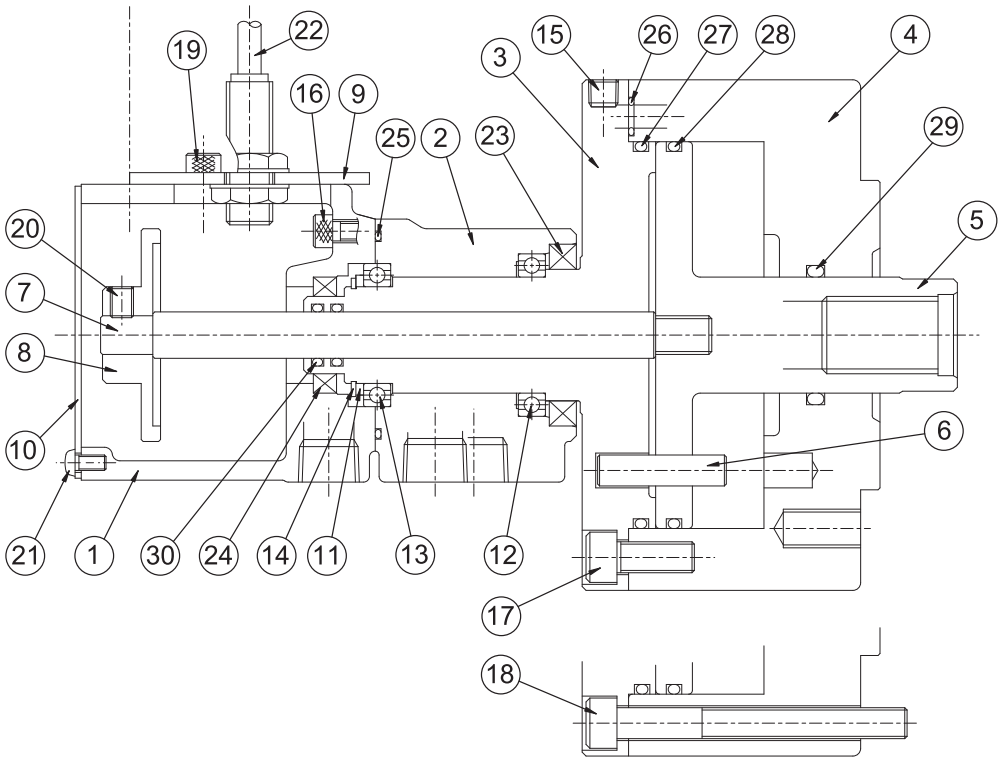
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 13 | 墊圈 | Washer | 1 |
| 14 | 球軸承 | Bearing | 1 |
| 15 | 球軸承 | Bearing | 1 |
| 16 | C 型扣環 | Snap Ring | 1 |
| 17 | 斜管牙管塞 | Plug Screw | 1 |
| 18 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 19 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 or12 |
| 20 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |
| 21 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 22 | 六角孔固定螺絲 | Hex. socket set screw | 1 |
| 23 | 六角孔半圓頭螺絲 | Hex. socket button screw | 3 |
| 24 | 近接開關 | Proximity Switch | 2 |

## 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RS-75 | RS-100 | RS- 125 | RS- 150 | RS-200 | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|
| 25 | 油封 | Oil Seal | TC34477 | | | | | 1 |
| 26 | 油封 | Oil Seal | TC20306 | | | | | 1 |
| 27 | O 型環 | O-Ring | S50 | | | | | 1 |
| 28 | O 型環 | O-Ring | P7 | | | | P9 | 2 |
| 29 | O 型環 | O-Ring | G70 | G95 | G120 | G145 | AS568-264 | 1 |
| 30 | O 型環 | O-Ring | | | P115 | P140 | G190 | 1 |
| 31 | O 型環 | O-Ring | P30 | P30 | P35 | P45 | P55 | 1 |
| 32 | O 型環 | O-Ring | P12 | | | | | 2 |

## 11.5 RS-N 型零件分解圖

## 11.5 RS-N type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 行控盒 | Case | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 油壓缸體 | Cylinder Body | 1 |
| 5 | 活塞 | Piston | 1 |
| 6 | 止迴銷 | Guide Pin | 2 |
| 7 | 感應心軸 | Sensor Bar | 1 |
| 8 | 檢出環 | Detectable ring | 1 |
| 9 | 檢出調整座板 | Adjusting plate | 2 |
| 10 | 後蓋板 | Cover | 1 |
| 11 | 墊圈 | Washer | 1 |

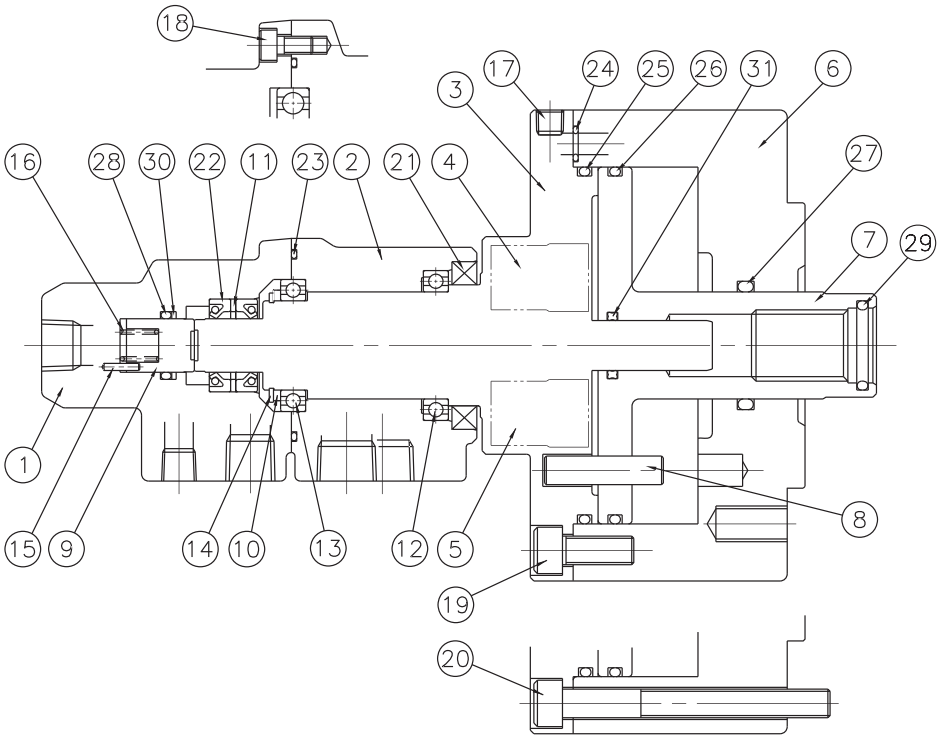
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 12 | 球軸承 | Bearing | 1 |
| 13 | 球軸承 | Bearing | 1 |
| 14 | C 型扣環 | Snap Ring | 1 |
| 15 | 斜管牙管塞 | Plug Screw | 2 |
| 16 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 17 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 or 12 |
| 18 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |
| 19 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 4 |
| 20 | 六角孔固定螺絲 | Hex. socket set screw | 1 |
| 21 | 六角孔半圓頭螺絲 | Hex. socket button screw | 3 |
| 22 | 近接開關 | Proximity Switch | 2 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RS-6520N RS-6530N | RS-75N RS-7530N | RS- 100N RS- 1030N | RS- 125N | RS- 150N | RS-200N | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|---|
| 23 | 油封 | Oil Seal | TC34477 | | | | | | 1 |
| 24 | 油封 | Oil Seal | TC20306 | | | | | | 1 |
| 25 | O 型環 | O-Ring | S50 | | | | | | 1 |
| 26 | O 型環 | O-Ring | P7 | | | | | P9 | 2 |
| 27 | O 型環 | O-Ring | G60 | G70 | G95 | G120 | G145 | AS568-264 | 1 |
| 28 | O 型環 | O-Ring | | | | P115 | P140 | G190 | 1 |
| 29 | O 型環 | O-Ring | P25 | P30 | P30 | P35 | P45 | P55 | 1 |
| 30 | O 型環 | O-Ring | P12 | | | | | | 2 |

## 11.6 RL 型零件分解圖

## 11.6 RL type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 注水閥體 | Coolant Valve Body | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 自鎖閥 | Check Valve | 2 |
| 5 | 洩壓閥 | Relief Valve | 2 |
| 6 | 油壓缸體 | Cylinder Body | 2 |
| 7 | 活塞 | Piston | 1 |
| 8 | 止迴銷 | Guide Pin | 2 |
| 9 | 固定密封件 | Ceramic Seal | 1 |
| 10 | 墊圈 | Washer | 1 |

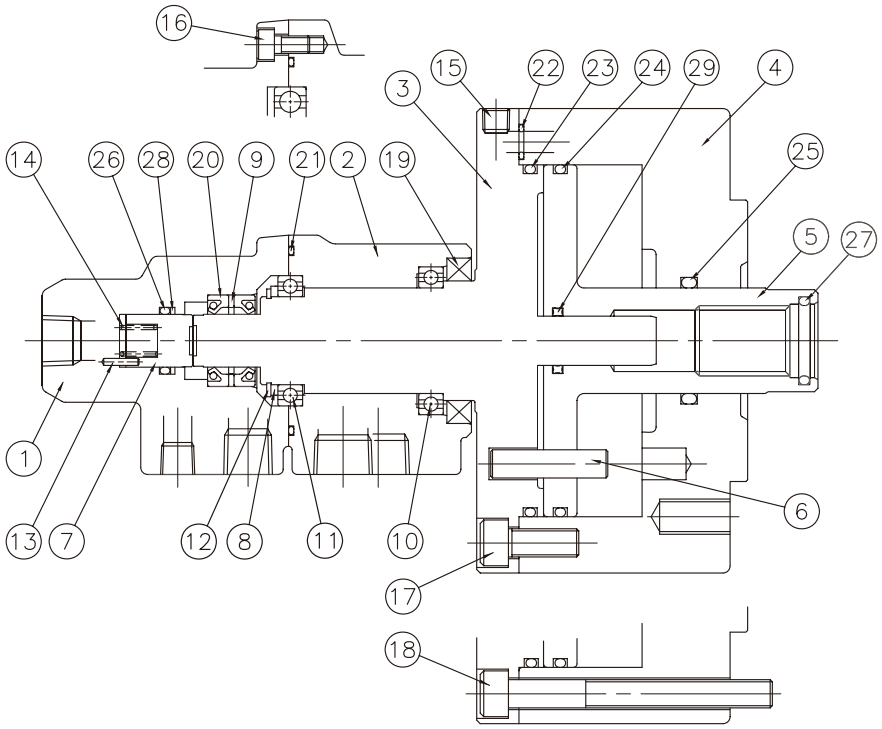
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 11 | 墊圈 | Washer | 1 |
| 12 | 球軸承 | Bearing | 1 |
| 13 | 球軸承 | Bearing | 1 |
| 14 | C 型扣環 | Snap Ring | 1 |
| 15 | 定位銷 | Lock Pin | 1 |
| 16 | 壓縮彈簧 | Spring | 1 |
| 17 | 斜管牙管塞 | Plug Screw | 1 |
| 18 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 4 |
| 19 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 6 or 12 |
| 20 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 6 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RL-75 | RL-100 | RL-125 | RL-150 | RL-200 | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|
| 21 | 油封 | Oil Seal | TC34477 | | | | | 1 |
| 22 | 油封 | Oil Seal | TC15266 | | | | | 2 |
| 23 | O 型環 | O-Ring | S50 | | | | | 1 |
| 24 | O 型環 | O-Ring | P7 | | | | P9 | 2 |
| 25 | O 型環 | O-Ring | G70 | G95 | G120 | G145 | AS568-264 | 1 |
| 26 | O 型環 | O-Ring | | | P115 | P140 | G190 | 1 |
| 27 | O 型環 | O-Ring | P30 | | P35 | P45 | P55 | 1 |
| 28 | O 型環 | O-Ring | P15 | | | | | 1 |
| 29 | O 型環 | O-Ring | P21 | | JASO2025 | S32 | S38 | 1 |
| 30 | 背托環 | Buck-up Ring | P15(GN0748AO) | | | | | 1 |
| 31 | 星型環 | Quad Ring | QRAR04113 | | | | | 1 |

## 11.7 RL-N 型零件分解圖

## 11.7 RL-N type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 注水閥體 | Coolant Valve Body | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 油壓缸體 | Cylinder Body | 1 |
| 5 | 活塞 | Piston | 1 |
| 6 | 止迴銷 | Guide Pin | 2 |
| 7 | 固定密封件 | Ceramic Seal | 1 |
| 8 | 墊圈 | Washer | 1 |
| 9 | 墊圈 | Washer | 1 |

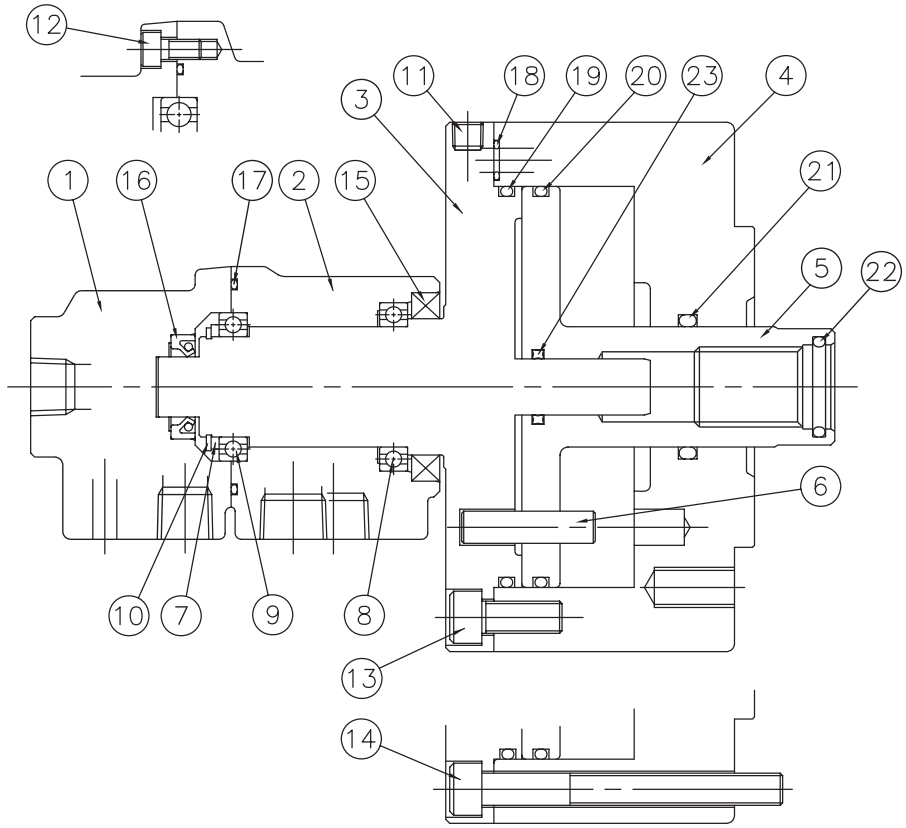
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 10 | 球軸承 | Bearing | 1 |
| 11 | 球軸承 | Bearing | 1 |
| 12 | C 型扣環 | Snap Ring | 1 |
| 13 | 定位銷 | Lock Pin | 1 |
| 14 | 壓縮彈簧 | Spring | 1 |
| 15 | 斜管牙管塞 | Plug Screw | 2 |
| 16 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 4 |
| 17 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 6 or 12 |
| 18 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 6 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RL-75N | RL-100N | RL-125N | RL-150N | RL-200N | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|
| 19 | 油封 | Oil Seal | TC34477 | | | | | 1 |
| 20 | 油封 | Oil Seal | TC15266 | | | | | 2 |
| 21 | O 型環 | O-Ring | S50 | | | | | 1 |
| 22 | O 型環 | O-Ring | P7 | | | | P9 | 2 |
| 23 | O 型環 | O-Ring | G70 | G95 | G120 | G145 | AS568-264 | 1 |
| 24 | O 型環 | O-Ring | | | P115 | P140 | G190 | 1 |
| 25 | O 型環 | O-Ring | P30 | | P35 | P45 | P55 | 1 |
| 26 | O 型環 | O-Ring | P15 | | | | | 1 |
| 27 | O 型環 | O-Ring | P21 | | JASO2025 | S32 | S38 | 1 |
| 28 | 背托環 | Buck-up Ring | P15(GN0748AO) | | | | | 1 |
| 29 | 星型環 | Quad Ring | QRAR04113 | | | | | 1 |

## 11.8 RL-AN 型零件分解圖

## 11.8 RL-AN type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 注氣閥體 | Air Valve Body | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 油壓缸體 | Cylinder Body | 1 |
| 5 | 活塞 | Piston | 1 |
| 6 | 止迴銷 | Guide Pin | 2 |
| 7 | 墊圈 | Washer | 1 |

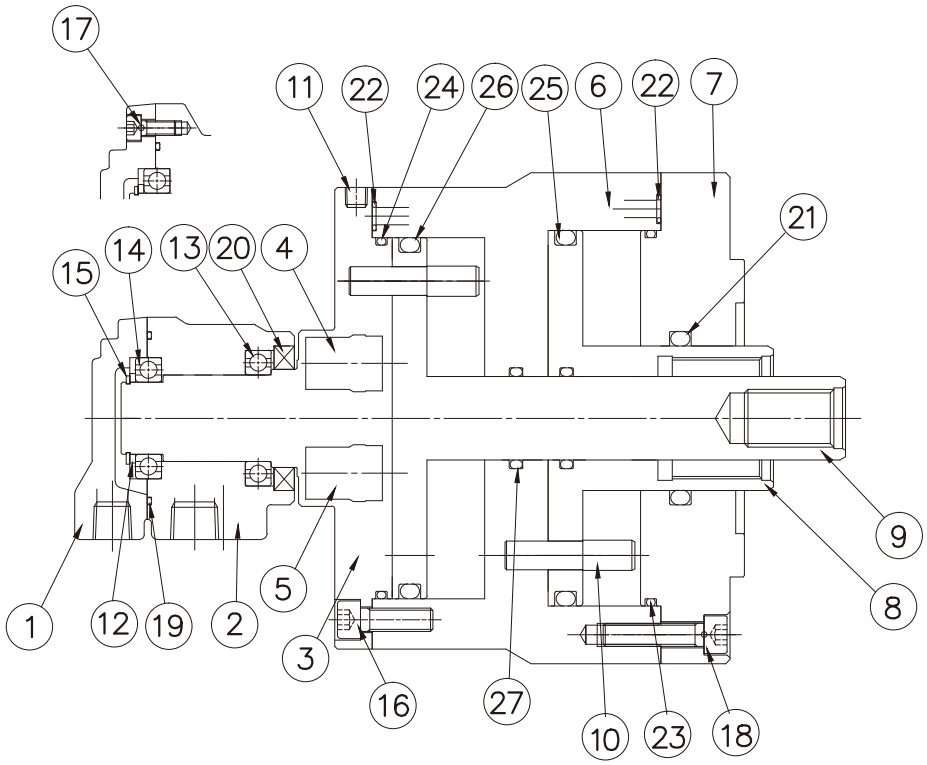
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 8 | 球軸承 | Bearing | 1 |
| 9 | 球軸承 | Bearing | 1 |
| 10 | C 型扣環 | Snap Ring | 1 |
| 11 | 斜管牙管塞 | Plug Screw | 2 |
| 12 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 4 |
| 13 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 6 or 12 |
| 14 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 6 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RL-A75N | RL-A100N | RL-A125N | RL-A150N | RL-A200N | Q'ty 數量 |
|---|---|---|---|---|---|---|---|---|
| 15 | 油封 | Oil Seal | TC34477 | | | | | 1 |
| 16 | 油封 | Oil Seal | TC15255 | | | | | 1 |
| 17 | O 型環 | O-Ring | S50 | | | | | 1 |
| 18 | O 型環 | O-Ring | P7 | | | | P9 | 2 |
| 19 | O 型環 | O-Ring | G70 | G95 | G120 | G145 | AS568-264 | 1 |
| 20 | O 型環 | O-Ring | | | P115 | P140 | G190 | 1 |
| 21 | O 型環 | O-Ring | P30 | | P35 | P45 | P55 | 1 |
| 22 | O 型環 | O-Ring | P21 | | JASO2025 | S32 | S38 | 1 |
| 23 | 星型環 | Quad Ring | QRAR04113 | | | | | 1 |

## 11.9 RD 型零件分解圖

## 11.9 RD type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 閥蓋 | Rear Cover | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 自鎖閥 | Check Valve | 2 |
| 5 | 洩壓閥 | Relief Valve | 2 |
| 6 | 油壓缸體 | Cylinder Body | 1 |
| 7 | 油壓缸蓋 | Cylinder Cover | 1 |
| 8 | 短活塞 | Short Piston | 1 |
| 9 | 長活塞 | Long Piston | 1 |

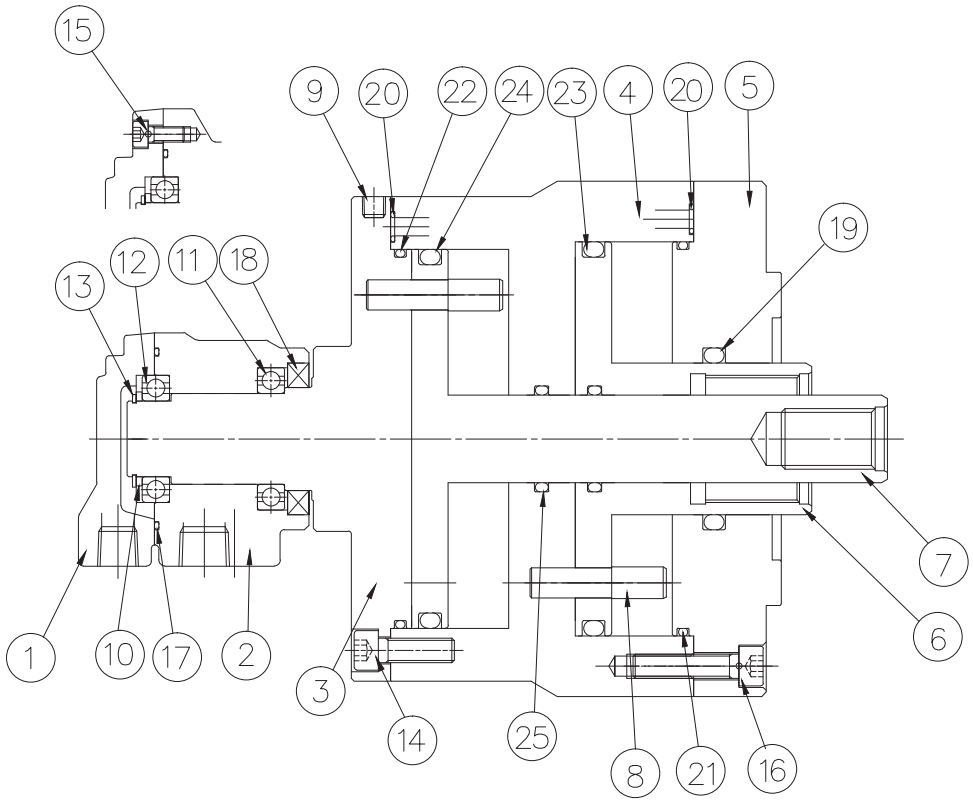
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 10 | 止迴銷 | Guide Pin | 4 |
| 11 | 斜管牙管塞 | Plug Screw | 6 |
| 12 | 墊圈 | Washer | 1 |
| 13 | 滾珠軸承 | Bearing | 1 |
| 14 | 滾珠軸承 | Bearing | 1 |
| 15 | C 型扣環 | Snap Ring | 1 |
| 16 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 12 |
| 17 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 4 |
| 18 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 12 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RD-120 | RD-125 | Q'ty 數量 |
|---|---|---|---|---|---|
| 19 | O 型環 | O-Ring | S55 | | 1 |
| 20 | 油封 | Oil Seal | TC34507 | | 1 |
| 21 | O 型環 | O-Ring | P50A | | 1 |
| 22 | O 型環 | O-Ring | P7 | | 3 |
| 23 | O 型環 | O-Ring | G125 | | 1 |
| 24 | O 型環 | O-Ring | G120 | | 1 |
| 25 | O 型環 | O-Ring | P120 | | 1 |
| 26 | O 型環 | O-Ring | P115 | | 1 |
| 27 | O 型環 | O-Ring | S29 | | 2 |

## 11.10 RD-N 型零件分解圖

## 11.10 RD-N type parts list




### 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 閥蓋 | Rear Cover | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 4 | 油壓缸體 | Cylinder Body | 1 |
| 5 | 油壓缸蓋 | Cylinder Cover | 1 |
| 6 | 短活塞 | Short Piston | 1 |
| 7 | 長活塞 | Long Piston | 1 |
| 8 | 止迴銷 | Guide Pin | 4 |

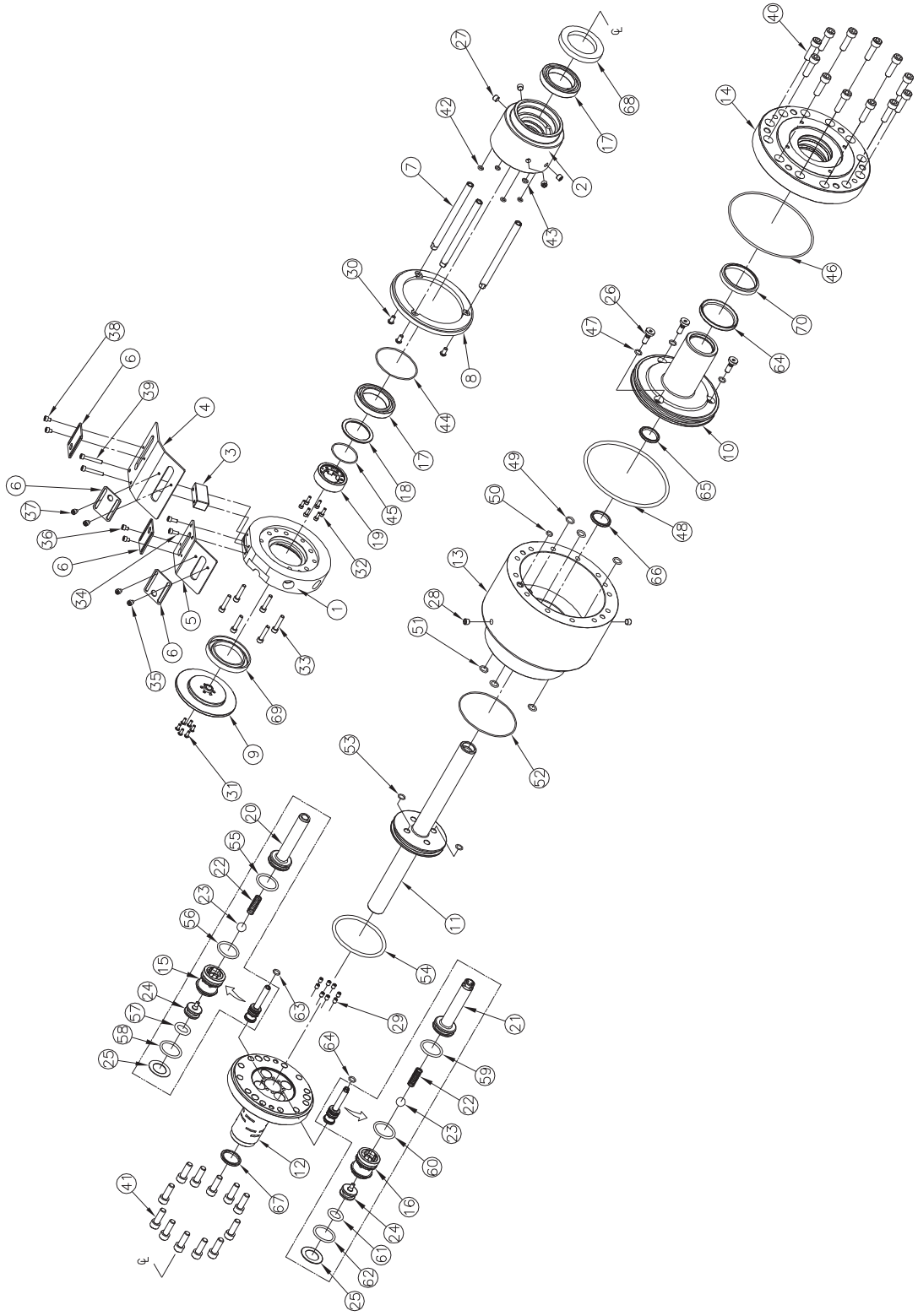
| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 9 | 斜管牙管塞 | Plug Screw | 6 |
| 10 | 墊圈 | Washer | 1 |
| 11 | 滾珠軸承 | Bearing | 1 |
| 12 | 滾珠軸承 | Bearing | 1 |
| 13 | C 型扣環 | Snap Ring | 1 |
| 14 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 12 |
| 15 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 4 |
| 16 | 六角孔圓頭螺栓 | Hex. Socket cap bolt | 12 |

### 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RD-120N | RD-125N | Q'ty 數量 |
|---|---|---|---|---|---|
| 17 | O 型環 | O-Ring | S55 | | 1 |
| 18 | 油封 | Oil Seal | TC34507 | | 1 |
| 19 | O 型環 | O-Ring | P50A | | 1 |
| 20 | O 型環 | O-Ring | P7 | | 3 |
| 21 | O 型環 | O-Ring | G125 | | 1 |
| 22 | O 型環 | O-Ring | G120 | | 1 |
| 23 | O 型環 | O-Ring | P120 | | 1 |
| 24 | O 型環 | O-Ring | P115 | | 1 |
| 25 | O 型環 | O-Ring | P29 | | 2 |

## 11.11 RDL 型零件分解圖

## 11.11 RDL type parts list



## 零件表 Parts List

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 1 | 閥蓋 | Rear Cover | 1 |
| 2 | 閥體 | Valve Housing | 1 |
| 3 | 檢出開關座支柱 | Switch place prop | 1 |
| 4 | 前缸檢出開關座 | Switch place | 1 |
| 5 | 後缸檢出開關座 | Switch place | 1 |
| 6 | 檢出定位板 | Lock plate | 1 |
| 7 | 檢出導銷 | Guide Pin | 3 |
| 8 | 前缸檢出環 | Detectable ring | 1 |
| 9 | 後缸檢出環 | Detectable ring | 1 |
| 10 | 前缸活塞 | Piston | 1 |
| 11 | 後缸活塞 | Piston | 1 |
| 12 | 迴轉閥軸 | Rotary Valve Shaft | 1 |
| 13 | 缸體 | Cylinder Body | 1 |
| 14 | 缸蓋 | Cylinder Cover | 1 |
| 15 | 自鎖閥 | Check Valve | 2 |
| 16 | 自鎖閥 (AB) | Check Valve | 2 |
| 17 | 滾珠軸承 | Ball Bearing | 2 |
| 18 | 墊圈 | Washer | 1 |
| 19 | 外柵環 | Outside Flinger | 1 |
| 20 | 自鎖閥珠保持座 | Retainer | 2 |
| 21 | 自鎖閥珠保持座 (A) | Retainer(A) | 1 |
| | 自鎖閥珠保持座 (B) | Retainer(B) | 1 |

| No. | 零件名稱 | Name of parts | Q'ty 數量 |
|---|---|---|---|
| 22 | 彈簧 | Spring | 4 |
| 23 | 鋼珠 | Steel Ball | 4 |
| 24 | 導引活塞 | Pilot piston | 4 |
| 25 | 墊片 | Gasket | 4 |
| 26 | 鎖固螺栓 | Set screw | 3 |
| 27 | 斜管牙管塞 | Plug screw | 4 |
| 28 | 斜管牙管塞 | Plug screw | 2 |
| 29 | 六角孔固定螺絲 | Hex. socket set screw | 8 |
| 30 | 六角孔半圓頭螺栓 | Hex. socket button screw | 3 |
| 31 | 六角孔半圓頭螺栓 | Hex. socket button screw | 6 |
| 32 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |
| 33 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 6 |
| 34 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 2 |
| 35 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 2 |
| 36 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 2 |
| 37 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 2 |
| 38 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 2 |
| 39 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 2 |
| 40 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 12 |
| 41 | 六角孔圓頭螺栓 | Hex. socket cap bolt | 12 |
| | | | |
| | | | |

## 消耗零件表 Consumable Parts

| No. | 零件名稱 | Name of parts | RDL-160S | Q'ty 數量 |
|---|---|---|---|---|
| 42 | O 型環 | O-Ring | FOR100700 | 5 |
| 43 | O 型環 | O-Ring | FOR100800 | 1 |
| 44 | O 型環 | O-Ring | FOR307500 | 1 |
| 45 | O 型環 | O-Ring | FOR304600 | 1 |
| 46 | O 型環 | O-Ring | FORF15500 | 1 |
| 47 | O 型環 | O-Ring | FOR101000 | 3 |
| 48 | O 型環 | O-Ring | FOR21500K | 1 |
| 49 | O 型環 | O-Ring | FOR101200 | 3 |
| 50 | O 型環 | O-Ring | FOR100900 | 1 |
| 51 | O 型環 | O-Ring | FOR101200 | 3 |
| 52 | O 型環 | O-Ring | FOR310500 | 1 |
| 53 | O 型環 | O-Ring | FOR101000 | 2 |
| 54 | O 型環 | O-Ring | FOR109000 | 1 |
| 55 | O 型環 | O-Ring | FOR410170 | 2 |
| 56 | O 型環 | O-Ring | FOR410170 | 2 |
| 57 | O 型環 | O-Ring | FOR10102K | 2 |
| 58 | O 型環 | O-Ring | FOR410170 | 2 |
| 59 | O 型環 | O-Ring | FOR410170 | 2 |
| 60 | O 型環 | O-Ring | FOR410170 | 2 |

| No. | 零件名稱 | Name of parts | RDL-160S | Q'ty 數量 |
|---|---|---|---|---|
| 61 | O 型環 | O-Ring | FOR10102K | 2 |
| 62 | O 型環 | O-Ring | FOR410170 | 2 |
| 63 | O 型環 | O-Ring | FOR101000 | 2 |
| 64 | O 型環 | O-Ring | FOR101000 | 2 |
| 64 | 密封圈 | Sealing Ring | FORE06000 | 1 |
| 65 | 密封圈 | Sealing Ring | FORE03000 | 1 |
| 66 | 密封圈 | Sealing Ring | FORE03000 | 1 |
| 67 | 密封圈 | Sealing Ring | FORE03000 | 1 |
| 68 | 油封 | Oil Seal | FOS10570B | 1 |
| 69 | 油封 | Oil Seal | FOS10570B | 1 |
| 70 | 油封 | Oil Seal | FSR106000 | 1 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

為精進產品品質，本公司擁有變更之權利，如有變更恕不另行通知。
We reserve the right to modify without prior notice.


佳賀精機股份有限公司
AUTOGRIP MACHINERY CO., LTD.

513006 彰化縣埔心鄉明聖路一段229號
No. 229, Sec. 1, Mingsheng Rd., Puxin Township,
Changhua County 513006, Taiwan

T +886-4-822-8719
F +886-4-823-5719
E sales@autogrip.com.tw
www.autogrip.com.tw


ISO 9001


EBIMC001G
V.2025.06