Q&A

原點定位夾持系統

- Q:如何確定夾持兩點之間是在同一直線上？

- A:以量表(百分表或千分表)在模組基準面上(有刻LOGO那面)，以X軸向量測校正到0.01mm內，如果有購買校正板則可以使用校正板做重現性量測。原廠出廠時均會透過精密三次元校正兩模組間的水平軸與底板的X軸為同水平，特製較長底板如以國際標準允收公差為每300mm允許0.01的誤差值，例如600mm的底板其允收公差為0.02mm,依此類推……。

原點定位夾持系統

- Q: 夾持模組上是否可能殘留鐵屑？

1. 模組使用方式為手動換模及自動換模兩種不同方式
2. 換模過程中的清潔對於手動換模是必要的，除夾持套筒內部雖然有集屑槽的設計，仍建議以空氣槍清潔，模組承靠基準建議以擦拭布擦拭乾淨。
3. 可去除可能沾黏的鐵、鋁屑到集屑槽。
4. 自動化：2.0版可自動吹氣將鐵屑部分清除及增加檢測氣壓洩漏功能，我司建議在使用一段時間後仍需保養清理，少部分因為治具設計問題無法確實清理乾淨，如有任何使用問題歡迎與我司相關人員聯繫。

原點定位夾持系統

- Q:若上板為客戶自行製作，定位拉栓的距離有些許誤差怎麼辦？

1.120夾持系統為專利自動補償裝置，並透過邏輯迴路順序夾持，以確保原點位置無誤，兩點間的線性誤差為+/-0.02mm以下(建議為+/-0.01)，請在設計時確認加工精準性，因為會造成補償時的磨耗，甚至模組毀損。

2.62夾持系統為專利自動補償裝置，並透過邏輯迴路順序夾持，以確保原點位置無誤，兩點間的線性誤差為+/-0.01mm以下，請在設計時確認加工精準性，因為會造成補償時的磨耗，甚至模組毀損。

3.加工拉栓孔時也要注意其垂直度每0.05度的誤差會造成接近0.03mm的間距誤差。

4.120拉栓以及內徑自動補償相對間隙補償為0.02mm以內

5.62拉栓以及內徑自動補償相對間隙補償為0.01mm以內

原點定位夾持系統

- Q:若溫度太高是否會影響精度?

1. 底座在加工後均有做應力釋放，但特製底板在特殊裝況下，因為素材間的晶相組織無法做到完全均質，仍有可能在外力影響下二次釋放，大部分因素為鎖固過力、撞擊，因為時間久的自然變形等，溫度影響的熱膨脹係數，其實不在考量範圍內，鋼材的熱膨脹係數為0.0147mm/K(100攝氏度內)。
2. 工作溫度建議在60度攝氏下，因為我司產品為高精密元件，其產品耦配是非常精密的，內部使用油壓，油的膨脹壓力從40度攝氏開始攀升，60度攝氏以上作業則不能保證補償的一致性，其誤差會大於0.02mm以上。

原點定位夾持系統

- Q1:模組材質是什麼？能否防鏽？電鍍層會不會影響精度？
- Q2:能否通過RoHS規範？

- A1:模組為特殊鋼，私人knowhow。
- A1:夾持模組有防腐蝕處理，底板無防銹。
- A1:電鍍層不會影響精度，knowhow。
- A2:都可通過RoHS規範。

原點定位夾持系統

Q:夾持系統是用氣壓或油壓？

1. 我司Ø120夾持系統可使用兩種壓力來源作為鬆脫使用，您可以選擇適合您的壓力源來做應用，油壓及氣壓作動方式相同，但夾持的力量有所差異，油壓為每個模組2000KG、氣壓為1000KG。(Ø62型油壓為每個模組800KG、氣壓為300KG。)
2. 使用氣壓需6-8kg/cm =(5bar)
3. 油壓輸出範圍35~40kg/cm =(29-34bar)，不可超過40kg/cm。
4. Ø120單顆夾持需油量67cc。
5. Ø62單顆夾持需油量7.5cc。

原點定位夾持系統

- Q:在同一模組上放置兩個不同工件，不使用交換盤，如何定位？

- A:可使用兩組定位夾持模組，使各穴都有定位功能，但放置工件須注意不可錯放。可客製為雙定位，並在治具底下加裝定位PIN以防止放置錯位。

原點定位夾持系統

- Q:重黏度切削油是否影響精準度？
- A:重油厚度不會影響定位精度也不會影響鎖固力。

原點定位夾持系統

- 夾緊力是定位拉栓被拉入到原點定位裝置中夾緊螺栓的最大允許的拉力。
- 120定位拉栓：附加M12.9*35L螺絲To
- 62定位拉栓：附加M8.9*20L螺絲To

原點定位夾持系統

- Q1:120型定位模組放鬆時會上浮幾mm?
- A1:約上浮3mm。如果是要裝在手臂前端的快換上，我們會建議不要選擇有上浮。

- Q2:62型定位模組放鬆時會上浮幾mm?
- A2:約上浮1.5mm。如果是要裝在手臂前端的快換上，我們會建議不要選擇有上浮。

- Q3:機械手臂從側面抓取托盤適合用上浮機構嗎？
- A3:治具鬆開上浮後會往前傾，導致治具沒有一個支撐點所以我們不建議機械手臂使用上浮機構。

原點定位夾持系統

- 產品優點：
- 零件少，失效率低，壽命長
- 定位拉栓標準品需用M12.9級螺絲(120型)及M8.9級(62型)／ 預防鎖死後的問題
- 車床類不適用

原點定位夾持系統

- Ø62定位拉栓螺絲鎖附-最大扭力值: 10~17 N.m
- Ø120定位拉栓螺絲鎖附-最大扭力值:30~40 N.m
- 警語:62型上板(治具)建議重量-3kg以內,往外延伸各單邊25mm,治具厚度20-25mm。
- 警語:120型上板(治具)建議重量-15kg以內,往外延伸各單邊50mm,治具厚度25-30mm 。

- 治具板(又稱交換盤)與模組作動時,拉栓要對準模組孔位避免造成模組孔位周圍的損壞。

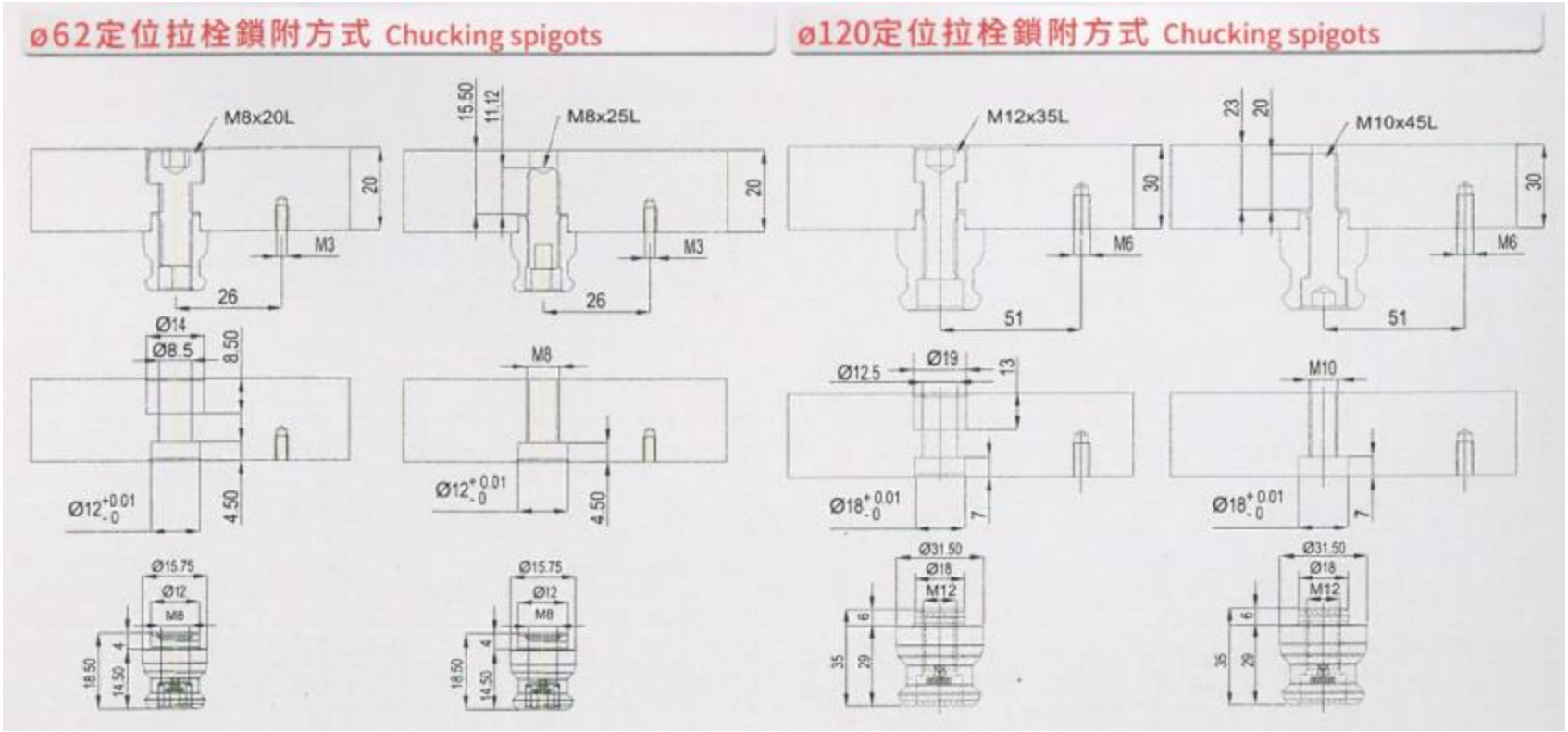
原點定位夾持系統

- 製作治具時，請依照以下步驟承製
- 步驟一、 依照定位拉栓安裝示意圖，於治具素材加工2個定位拉栓孔。
- 步驟二、 定位拉栓孔加工完成後，鎖附定位拉栓。(請參照鎖附扭力值)
- 步驟三、 將已安裝定位拉栓的治具素材鎖附於機台上的原點定位夾持模組。
- 步驟四、 鎖附完成後，即可開始加工治具形狀、溝槽、孔位...等。
- 並同時完成多組治具，以確保治具尺寸的一致性。

原點定位夾持系統

- Ø62載重100KG/穴，標準二穴為200KG,治具加工件總重超過3kg，建議就要使用引導柱。
- Ø120載重為500KG/ 穴，標準二穴為1000KG,治具加工件總重超過15kg， 建議就要使用引導柱。

原點定位夾持系統


ø62定位拉栓鎖附方式 Chucking spigots
ø120定位拉栓鎖附方式 Chucking spigots
M8x20L
M8x25L
M12x35L
M10x45L
M3
M6
26
51
20
30
15.50
11.12
23
Ø14
Ø8.5
8.50
M8
M10
Ø12.5
Ø19
13
4.50
7
Ø15.75
Ø12
Ø31.50
Ø18
M12
18.50
14.50
35
29

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q:How to determine if the two points are colinear?

- A: Use a scale (dial indicator) on the module reference plane (the side with the engraved LOGO), and use the X-axis vector measurement to correct it to within 0.01mm. If you have purchased a calibration plate, you can use a calibration plate to make reproducible measurements. When the Zero Point Clamp leaves the factory, the horizontal axis between the two modules is aligned with the X axis of the bottom plate via a precise three-dimensional correction. If the baseplate is affected by international shipping standards, the tolerance value is 0.01 per 300mm. If the baseplate exceeds 600mm, the tolerance is 0.02mm,and so on.....

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q:Is it possible that iron scraps may remain on the clamping module?

  INNGRIT offers two types of modules: manual model change and automatic model change

Manual Model Change

- Personal cleaning during the mold change process is necessary for the manual mold change. Although there is a chip collecting grove in the clamping sleeve designed to remove chips, it is still recommended to use an air gun to clean.
- INNGRIT's Zero Point Chucks has an inbuilt dust collection tank that helps to remove dirt and milling debris

Automatic Model Change

- Version 2.0 has an inbuilt air blow out function that can automatically blow air to partially remove iron filings and increase the function of detecting air pressure leaks. Our company recommends that the operator still maintains and cleans up after a period of use. A small area cannot be cleaned up due to the design of the fixture. Please contact INNGRIT for more information.

INNGRIT ZERO POINT CLAMPING SYSTEM

Q: What if the exchange plate manufactured by the customer has a slight error in the distance of the positioning clamping studs?

1.120 The clamping system boasts a patented automatic compensation clamping technology. I clamps the stud is sequentially through a logic circuit to ensure that the origin position is correct. The maximum linear error between the two points is +/- 0.02mm (recommended +/- 0.01). Ensure to verify the processing accuracy, as a linear error greater than +/- 0.02mm may cause wear during compensation and possibly damage the module.

2.62 The clamping system boasts a patented automatic compensation clamping technology. I clamps the stud is sequentially through a logic circuit to ensure that the origin position is correct. The maximum linear error between the two points is +/- 0.01mm. Ensure to verify the processing accuracy, as a linear error greater than +/- 0.02mm may cause wear during compensation and possibly damage the module.

INNGRIT ZERO POINT CLAMPING SYSTEM

Q: What if the exchange plate manufactured by the customer has a slight error in the distance of the positioning clamping studs?

3. When processing the pull bolt hole, it should also be noted that a vertical error of 0.05 degrees will cause a spacing error of approximately to 0.03mm.

4. The 120 clamping stud and the inner diameter of the automatic compensation unit has a relative gap compensation within 0.02mm
5. The 62 clamping stud and the inner diameter of the automatic compensation unit has a relative gap compensation within 0.01mm

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q: Will the accuracy be affected if the temperature is too high?

1. Our base is subjected to stress release after processing, however other special base plate may be subject to special installation conditions. The crystal structure between the materials cannot be completely homogeneous, or it may still be released again under the influence of external forces and other overlooked factors. The thermal expansion coefficient of temperature and impact due to natural deformation such as force and impact over a long period of time is not considered. The thermal expansion coefficient of steel is 0.0147mm / K (within 100 degrees Celsius).
2. A temperature of 60 degrees Celsius is recommended as the maximum working temperature. Our products are high-precision components, for this reason the product coupling is very precise. The internal oil pressure is used. The expansion pressure of the oil starts to rise from 40 degrees Celsius. Operations above 60 degrees Celsius cannot be guaranteed. It is possible that error will be greater than 0.02mm if temperature surges beyond 60 degrees Celsius.

INNGRIT ZERO POINT CLAMPING SYSTEM

Q1: What is the material of the module? Can it prevent rust? Will the electrodeposit affect the accuracy?

Q2: Can I pass RoHS regulations?

A1: The module is a special grade of steel

A1: The clamping module has an anti-corrosion treatment. The bottom plate has no anti-rust.

A1: The electrodeposit will not affect the accuracy, knowhow.

A2: Both can pass RoHS regulations.

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q: Does the clamping system use air or oil pressure?

- INNGRIT's Ø120 Type Zero Point Clamping System can use two pressure sources for release. Your choice of pressure source is dependent on your application. The oil pressure and Pneumatic pressure operates the same way, however the clamping forces are different. The hydraulic model has a maximum clamping force of 2000KG while the pneumatic model has a maximum clamping force of 1000KG.(Ø62Type hydraulic model has a maximum clamping force of 800KG while the pneumatic model has a maximum clamping force of 300KG.)
- Pneumatic pressure must be 6-8kg / cm=(5bar)
- The Hydraulic pressure's operational range is 35 ~ 40kg / cm=(29-34bar), and should not exceed 40kg / cm.
- Ø120 a single clamp requires 67cc of oil.
- Ø62 a single clamp requires 7.5cc of oil.

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q: How to position two different workpieces on the same module without using an exchange plate?

A: Two sets of positioning and clamping modules can be used, so that each hole has a positioning function. However, care must be taken not to misplace the workpiece.

Customization can be done to allow for dual positioning. A positioning PIN should be installed under the exchange plate to prevent misplacement.

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q: Does high viscosity cutting oil affect the accuracy?

A: High viscosity cutting oil does not affect the positioning accuracy or the locking force.

INNGRIT ZERO POINT CLAMPING SYSTEM

- The clamping force is the maximum allowable pulling force of the clamping stud when the positioning stud is pulled into the Zero Point Clamp.

  - Ø 120 Type positioning studs: Uses M12.9 * 35L screws To
  - Ø 62 Type positioning studs: Uses M8.9 * 20L screws To

INNGRIT ZERO POINT CLAMPING SYSTEM

- Q1: How many millimeters does the Ø 120 type Zero Point Clamping module float when it is relaxed?
- A1: It floats about 3mm. We don’t recommend the floating technology on the quick exchange of the front the robotic arm.

- Q2: How many millimeters does the Ø 62 type Zero Point Clamping module float when it is relaxed?
- A2: It floats about 1.5mm. We don’t recommend the floating technology on the quick exchange of the front the robotic arm.

- Q3: Is it suitable to use the floating mechanism for the robot arm to grab the tray from the side?
- A3: The exchange plate will be ejected forward after unlocking and floating. This action results in the exchange plate not having any support point. We therefore do not recommend the use of a floating mechanism for the robot arm.

INNGRIT ZERO POINT CLAMPING SYSTEM

Product advantages:

- Fewer parts, lower failure rate, and longer life
- M12.9 screws (Ø 120 Type) and M8.9 screws (Ø 62 Type) are required for positioning studs of the standard products. Ensure to use the correct type of screw in order to prevent problems after locking
- Not applicable for lathes

INNGRIT ZERO POINT CLAMPING SYSTEM

- Maximum fastening torque of the Ø 62 pull bolt: 10-17 N.m
- Maximum fastening torque of the Ø 120 pull bolt: 30-40 N.m

1.Warning: The upper plate(exchange plate) of the ø62 type clamping module is recommended to weigh less than 3kg. Each side can extend a maximum of 15mm and the exchange plate should have a maximum thickness of 20-25mm.

2.Warning: The upper plate(exchange plate) of the ø120 type clamping module is recommended to weigh less than 15kg. Each side can extend a maximum of 50mm and the exchange plate should have a maximum thickness of 25-30mm.

- When the exchange plate and the module are actuated, the pull bolt should be aligned with the module hole position in order to avoid damage to the module’s hole position.

INNGRIT ZERO POINT CLAMPING SYSTEM

- When making exchange plates, please follow the steps below
- **Step 1.** Use the schematic diagram of the positioning studs to machine 2 their holes in the fixture material.
- **Step 2:** After the positioning stud hole processing is completed, lock the positioning stud. (Please refer to the attached torque value)
- **Step 3:** Attach the fixture material with the positioning studs to the Zero Point Clamping Module on the machine.
- **Step 4:** After the locking is completed, you can start processing the exchange plate's shape, groove, hole position, etc.,
- Complete multiple sets of exchange plates at the same time to ensure the consistency of the size of the exchange plates.

INNGRIT ZERO POINT CLAMPING SYSTEM

- The loading capacity of the Ø 62 type chuck is 100KG / chuck. The standard two chuck model is 200KG. If the total weight of the exchange plate and workpiece exceed 3kg, it is recommended to use a guide column

- The loading capacity of the Ø 120 type chuck is 500KG / chuck. The standard two chuck model is 1000KG. If the total weight of the exchange plate and workpiece exceed 15kg, it is recommended to use a guide column

INNGRIT ZERO POINT CLAMPING SYSTEM