



**FORCE ONE MACHINERY CO., LTD.**

**複上精機(股)公司**

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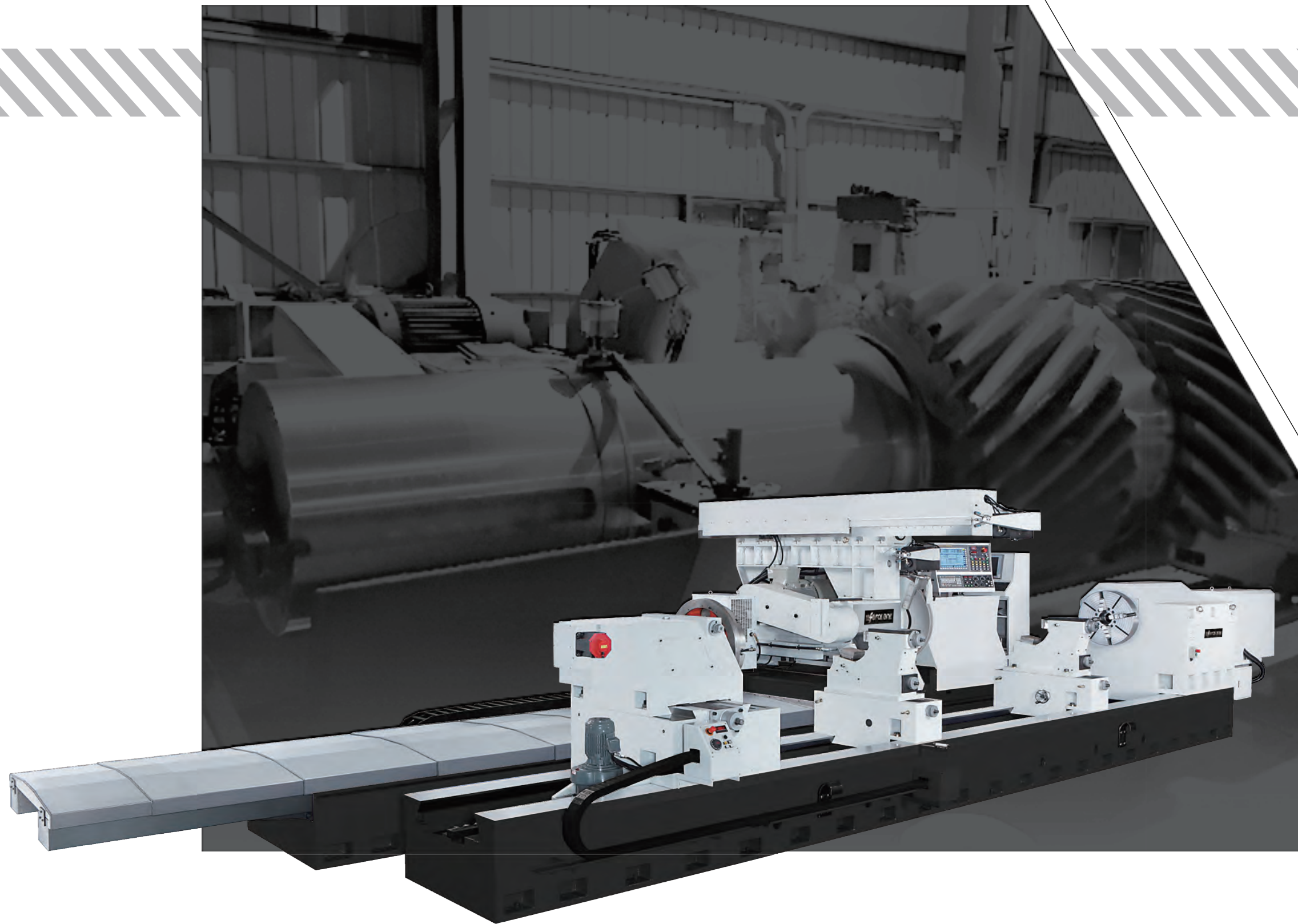
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# force ONE ROLL GRINDER



結構堅固，精密無比。  
創新設計，操作便捷。

Force One 品牌誕生於1997年，由複上精機 (Force One Machinery Co., Ltd.) 創立，專注於高階複合型CNC工具機的研發與製造。憑藉深厚的技術實力與不斷創新，Force One 已成為台灣具高度專業的高階複合工具機品牌，並在全球市場建立穩固地位。

品牌產品涵蓋CNC車床、車銑複合機、五軸加工機等多元機種，並不斷優化自動化與智慧製造技術，提供高效、精密的加工解決方案。Force One 產品在全球市場廣受肯定，特別在歐洲市場成功拓展業務，並提供OEM整合服務，滿足各產業對精密加工的需求。

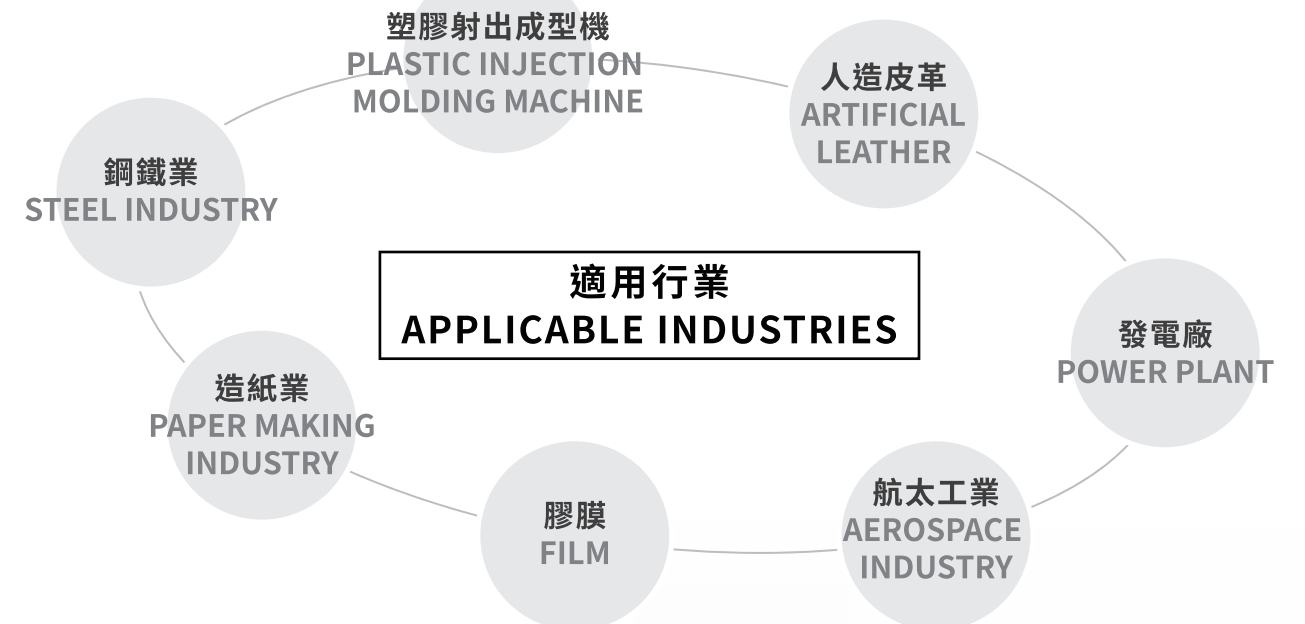
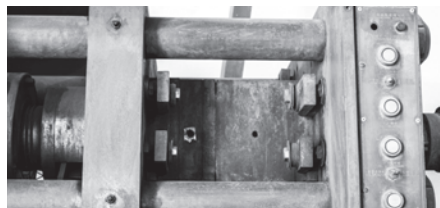
2023年，Force One 全面加入 CNC-TAKANG 優岡集團，透過集團資源整合，進一步擴展產品線，強化客製化與高階工具機製造能力，為全球客戶提供更全面的加工解決方案，提升生產效能與市場競爭力。

Ruggedly and Precisely Constructed Throughout.  
Advanced Design Concept Ensures User-friendly Operations.

The Force One brand was established in 1997 by Force One Machinery Co., Ltd., specializing in the development and manufacturing of high-end multi-functional CNC machine tools. With strong technical expertise and continuous innovation, Force One has become a highly professional high-end multi-tasking machine tool brand in Taiwan, establishing a solid presence in the global market.

The brand's product range includes CNC lathes, mill-turn machines, and five-axis machining centers, continuously enhancing automation and intelligent manufacturing technologies to provide efficient and precise machining solutions. Force One products have gained worldwide recognition, particularly in the European market, where the brand has successfully expanded its business and offers OEM integration services to meet the precision machining needs of various industries.

In 2023, Force One fully joined the CNC-TAKANG Group, leveraging the group's resources to expand its product portfolio and strengthen its customization and high-end machine tool manufacturing capabilities. This integration enables Force One to provide more comprehensive machining solutions, helping customers enhance production efficiency and competitiveness.



## 優異的研磨精度 OUTSTANDING GRINDING ACCURACY

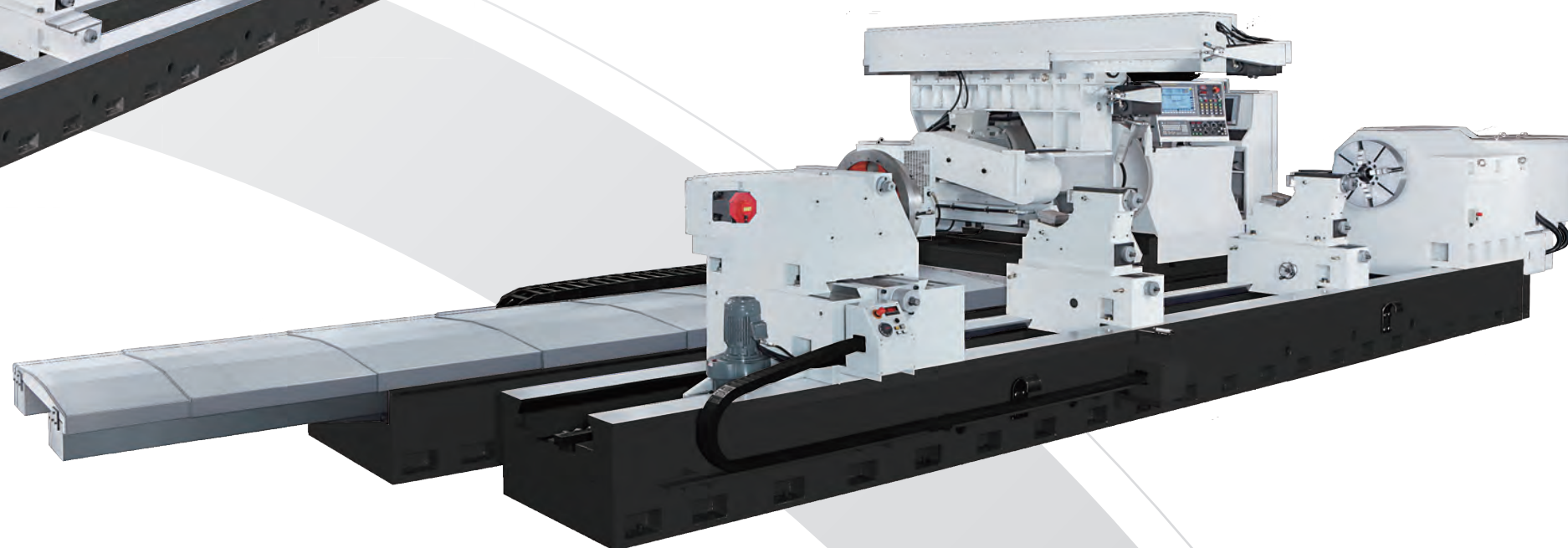
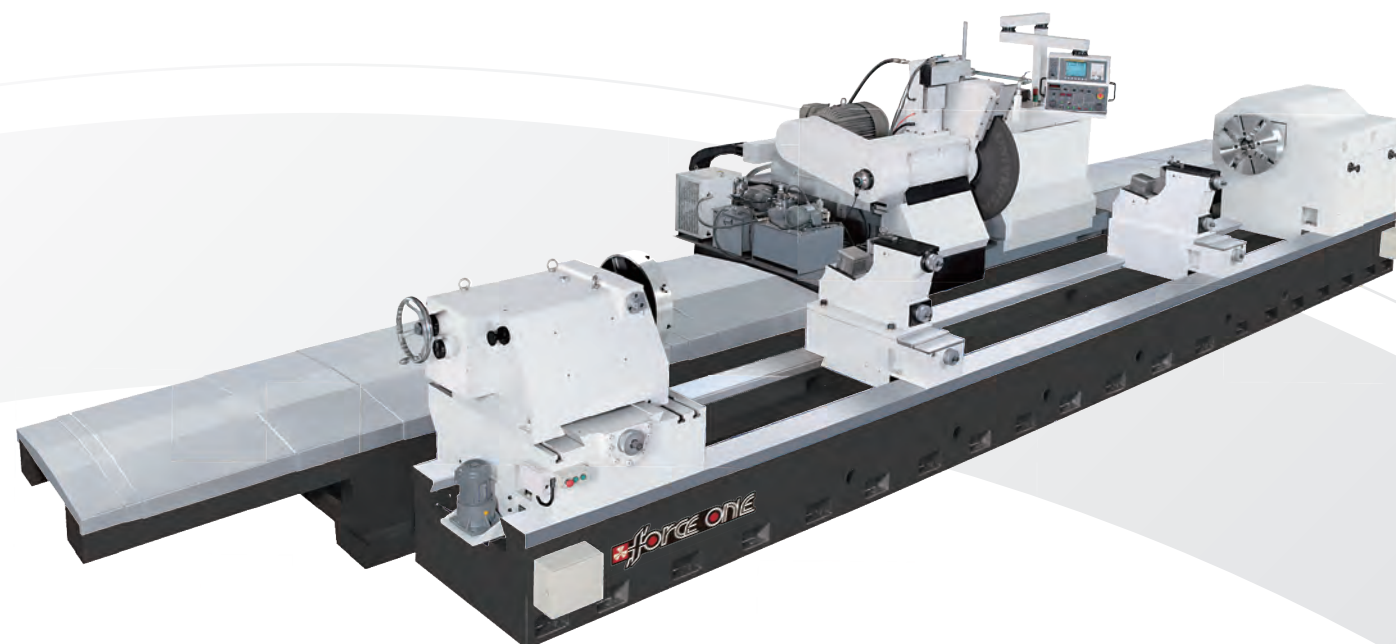
### 工件 WORKPIECE

|      |                       |                         |
|------|-----------------------|-------------------------|
| 軋輥外徑 | Roll outside diameter | Ø400 mm                 |
| 軋輥長度 | Roll length           | 5m                      |
| 軋輥材質 | Roll material         | 鋼材HRC 52° Steel HRC 52° |

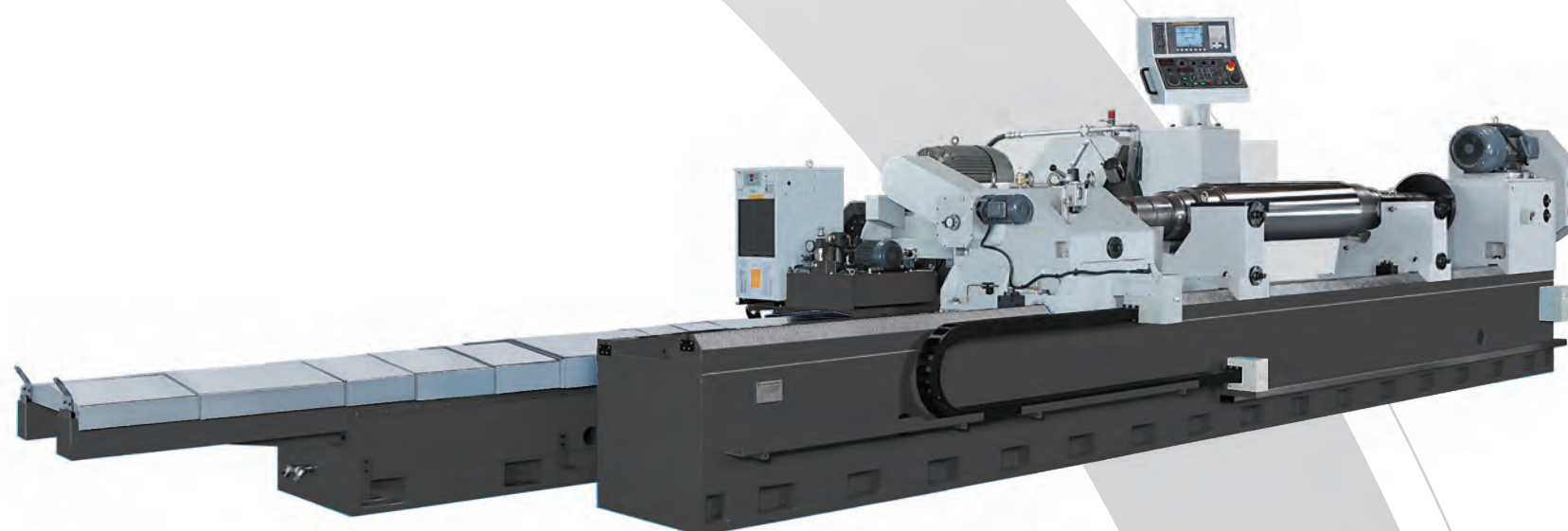
### 研磨精度 GRINDING ACCURACY

|      |                   |          |             |
|------|-------------------|----------|-------------|
| 真圓度  | Circularity       | 3μm 以內   | Within 3μm  |
| 真直度  | Straightness      | 5μm      |             |
| 表面精度 | Surface roughness | Ra0.1 以下 | Under Ra0.1 |





- 最大工作台上旋徑：Ø400, Ø850, Ø1300, Ø1600, Ø2000 mm。
- 兩頂心間最大距離：5 m, 6 m, 7 m, 8 m, 10 m, 12 m。
- 最大工件重量：40 噸。超過 40 噸可客製化。
- 砂輪頭移動式。
- 砂輪主軸軸承採用動靜壓複合支撐系統，確保最佳穩定性。
- X, Z 軸滑道採用動靜壓複合潤滑系統，使 X, Z 軸行程更輕巧、更平穩。
- X, Z 軸滑道貼附 Turcite-B 耐磨片。
- CNC 控制器選擇：發那科或西門子。
- 線上自動外徑量測裝置，可量測軋形及真圓度。
- Max. swing over table: Ø400, Ø850, Ø1300, Ø1600, Ø2000 mm.
- Max. distance between centers: 5 m, 6 m, 7 m, 8 m, 10 m, 12 m.
- Max. weight of workpiece: 40 tons. Weight over 40 tons is available.
- Traveling wheelhead type.
- The wheelhead spindle is supported by a hydrodynamic hydrostatic complex system, ensuring an optional stability.
- X, Z-axis slideways are lubricated by a hydrodynamic hydrostatic complex lubrication system, making X, Z-axis movement smoother and more stable.
- X, Z-axis slideways are coated with Turcite-B wear-resistance media.
- Choice of CNC controllers: Fanuc or Siemens.
- Automatic outside diameter measuring device on machine provides measurement for roll shape and circularity.



# FHS<sub>Type</sub>

研磨拋光複合機  
MULTI PURPOSE FOR GRINDING  
AND SUPER FINISH SURFACE



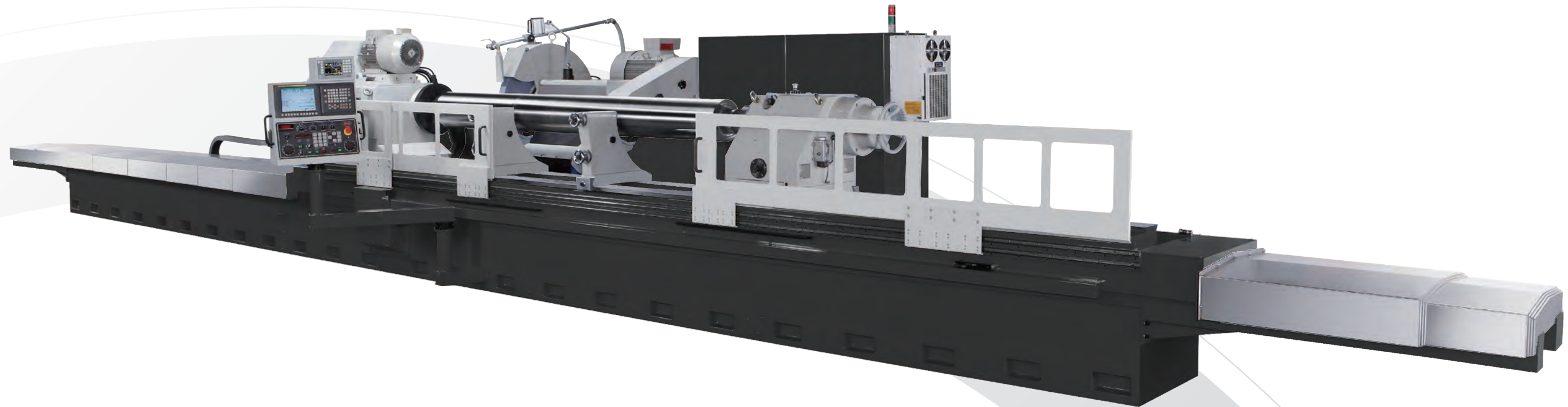
- 最大工作台上旋徑：Ø400, Ø850, Ø1300, Ø1600, Ø2000 mm。
- 兩頂心間最大距離：5 m, 6 m, 7 m, 8 m, 10 m, 12 m。
- 最大工件重量：15 噸。超過 15 噸可客製化。
- 砂輪頭移動式。
- 砂輪主軸軸承採用動靜壓複合支撐系統，確保最佳穩定性。
- X, Z 軸滑道採用動靜壓複合潤滑系統，使 X, Z 軸行程更輕巧、更平穩。
- X, Z 軸滑道貼附 Turcite-B 耐磨片。
- CNC 控制器選擇：發那科或西門子。
- 線上自動外徑量測裝置，可量測輓形及真圓度。
- Max. swing over table: Ø400, Ø850, Ø1300, Ø1600, Ø2000 mm.
- Max. distance between centers: 5 m, 6 m, 7 m, 8 m, 10 m, 12 m.
- Max. weight of workpiece: 15 tons. Weight over 15 tons is available.
- Traveling wheelhead type.
- The wheelhead spindle is supported by a hydrodynamic hydrostatic complex system, ensuring an optional stability.
- X, Z-axis slideways are lubricated by a hydrodynamic hydrostatic complex lubrication system, making X, Z-axis movement smoother and more stable.
- X, Z-axis slideways are coated with Turcite-B wear-resistance media.
- Choice of CNC controllers: Fanuc or Siemens.
- Automatic outside diameter measuring device on machine provides measurement for roll shape and circularity.



# FL Type

## CNC 外圓軋輥磨床 CNC ROLL GRINDER

force ONE



- 最大工作台上旋徑：Ø850, Ø1000, Ø1200 mm。
- 兩頂心間最大距離：2 m, 3 m, 4 m, 5 m, 6 m。
- 最大工件重量：6 噸。
- 工作台移動式。
- 砂輪主軸軸承採用動靜壓複合支撐系統，確保最佳穩定性。
- X, Z 軸滑道採用動靜壓複合潤滑系統，使 X, Z 軸行程更輕巧、更平穩。
- X, Z 軸滑道貼附 Turcite-B 耐磨片。
- 旋轉式尾座主軸。(選配)

- Max. swing over table: Ø850, Ø1000, Ø1200 mm.
- Max. distance between centers: 2 m, 3 m, 4 m, 5 m, 6 m.
- Max. weight of workpiece: 6 tons.
- Traveling table type.
- The wheelhead spindle is supported by a hydrodynamic hydrostatic complex system, ensuring an optional stability.
- X, Z-axis slideways are lubricated by a hydrodynamic hydrostatic complex lubrication system, making X, Z-axis movement smoother and more stable.
- X, Z-axis slideways are coated with Turcite-B wear-resistance media.
- Rotating tailstock spindle. (Optional)



- 內徑研磨裝置。(選配)
- 研磨深度可達 800 mm。

- Internal grinding device. (Optional)
- Grinding depth reaches 800 mm.

# FM Type

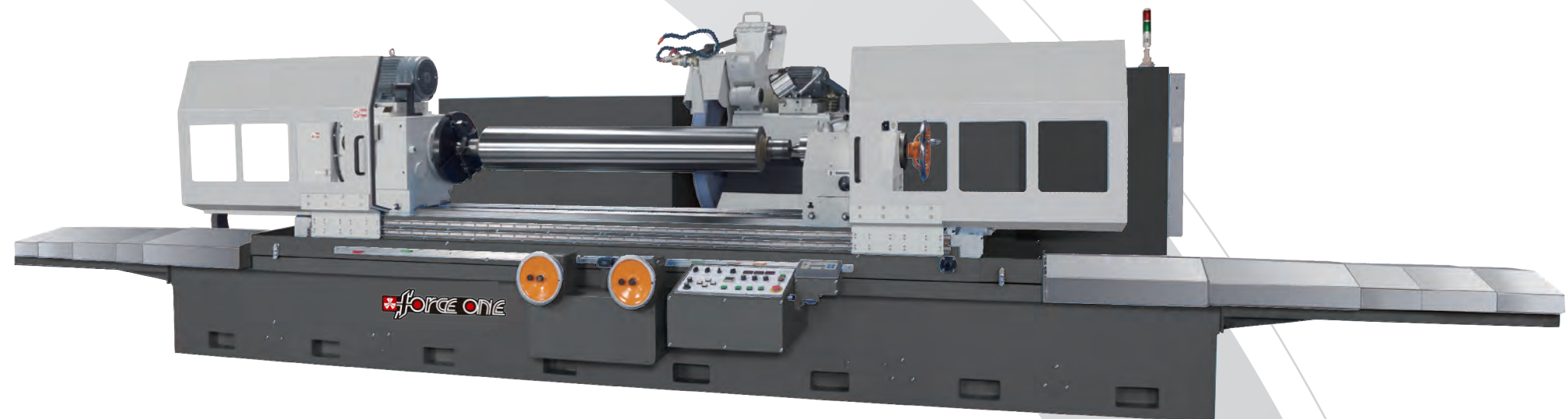
CNC 外圓軋磨床 / 傳統外圓軋磨床  
CNC CYLINDRICAL ROLL GRINDER  
TRADITIONAL CYLINDRICAL ROLL GRINDER



CNC 外圓軋磨床  
CNC CYLINDRICAL ROLL GRINDER

- 最大工作台上旋徑：Ø600 mm。
- 兩頂心間最大距離：3 m, 4 m, 5 m, 6 m。
- 最大工件重量：3 噸。
- 工作台移動式。
- 砂輪主軸軸承採用動靜壓複合支撐系統，確保最佳穩定性。
- X, Z 軸滑道採用動靜壓複合潤滑系統，使 X, Z 軸行程更輕巧、更平穩。
- X, Z 軸滑道貼附 Turcite-B 耐磨片。
- 旋轉式尾座主軸。(選配)

- Max. swing over table: Ø600 mm.
- Max. distance between centers: 3 m, 4 m, 5 m, 6 m.
- Max. weight of workpiece: 3 tons.
- Traveling table type.
- The wheelhead spindle is supported by a hydrodynamic hydrostatic complex system, ensuring an optional stability.
- X, Z-axis slideways are lubricated by a hydrodynamic hydrostatic complex lubrication system, making X, Z-axis movement smoother and more stable.
- X, Z-axis slideways are coated with Turcite-B wear-resistance media.
- Rotating tailstock spindle. (Optional)



傳統外圓軋磨床  
TRADITIONAL CYLINDRICAL ROLL GRINDER

# RGS Type

## CNC 外圓軋磨床 CNC ROLL GRINDER

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### 應用行業

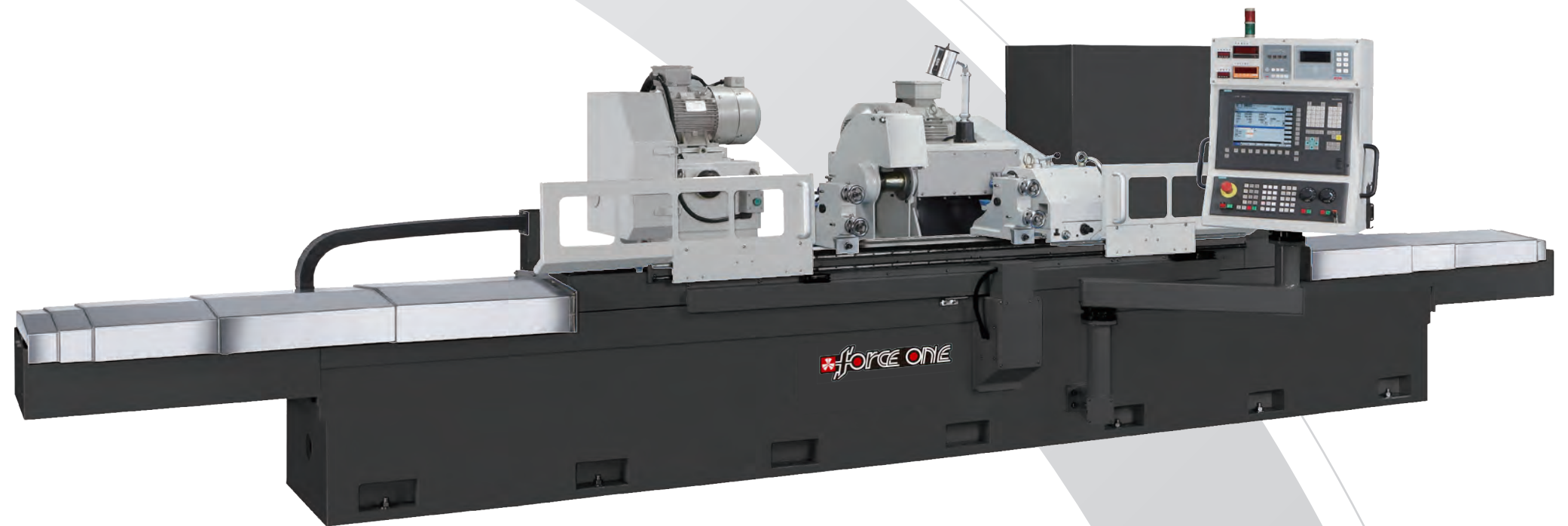
- 哥林柱 ( 塑膠射出成型機 )。
- 工作滾輪 ( 不銹鋼廠 )。

### APPLICABLE INDUSTRIES

- Tie bar (Plastic injection molding machine).
- Working roller (Stainless steel plant).

- 最大工作台上旋徑：Ø400 mm。
- 兩頂心間最大距離：1.5 m, 2 m, 3 m, 4 m。
- 最大工件重量：1.5 噸。
- 工作台移動式。
- 砂輪主軸軸承採用動靜壓複合支撐系統，確保最佳穩定性。
- X, Z 軸滑道採用動靜壓複合潤滑系統，使 X, Z 軸行程更輕巧、更平穩。
- X, Z 軸滑道貼附 Turcite-B 耐磨片。

- Max. swing over table: Ø400 mm.
- Max. distance between centers: 1.5 m, 2 m, 3 m, 4 m
- Max. weight of workpiece: 1.5 tons.
- Traveling table type.
- The wheelhead spindle is supported by a hydrodynamic hydrostatic complex system, ensuring an optional stability.
- X, Z-axis slideways are lubricated by a hydrodynamic hydrostatic complex lubrication system, making X, Z-axis movement smoother and more stable.
- X, Z-axis slideways are coated with Turcite-B wear-resistance media.



- 內徑研磨裝置。( 選配 )
- 研磨深度可達 600 mm。

- Internal grinding device. (Optional)
- Grinding depth reaches 600 mm.

# RGS32 Type

外圓磨床  
GRINDING MACHINE



| 項目 ITEM                                                  | 機種 MODEL                                          | 單位 UNIT | RGS32/10L-C2                        | RGS32/15L-C2 |
|----------------------------------------------------------|---------------------------------------------------|---------|-------------------------------------|--------------|
| 工作能力<br>Working Capacity                                 | 最大旋徑<br>Max. swing over bed or table              | mm      | φ320                                |              |
|                                                          | 兩頂心間最大距離<br>Max. distance between c.c.            | M       | 1.0                                 | 1.5          |
|                                                          | 工件最大重量<br>Max. weight of rollin neck rests        | KG      | 600                                 |              |
| 砂輪頭及橫向<br>進刀 (X軸)<br>Wheelhead<br>& Carriage<br>(X Axis) | 砂輪規格(外徑x寬x內徑)<br>Wheel size(O. D. x Width x Bore) | mm      | φ455 Xφ152.4X50                     |              |
|                                                          | 砂輪主軸潤滑系統<br>Type of lubricating system            | -       | 動靜壓複合式 Hydrostatic & dynamic system |              |
|                                                          | 砂輪主軸轉速<br>Rotating speed of wheel                 | R.P.M   | 0~1800                              |              |
|                                                          | 砂輪頭行程 (X軸)<br>Cross travel of wheehead (X axis)   | mm      | 200                                 |              |
|                                                          | 砂輪最大進給速度<br>Max. cross feed rate                  | mm/min  | 1000                                |              |
|                                                          | 砂輪頭每刻度進給量<br>Cross feed per grid                  | mm/p    | 0.005                               |              |
| 工作台 (Z軸)<br>Table (Z Axis)                               | 工作臺行程 (Z軸)<br>Travel of table or head (Z axis)    | mm      | 頂心距 +200 mm Center Distance +8"     |              |
|                                                          | 工作臺進給速度<br>Travel speed of table                  | mm/min  | 25~3000                             |              |
|                                                          | 導軌潤滑系統<br>Type of lubricating system              | -       | 動靜壓複合式 Hydrostatic & dynamic system |              |
| 主軸頭 & 尾座<br>Workhead &<br>Tailstock                      | 工作主軸轉速<br>Rotation speed of work head             | R.P.M   | 10-100                              |              |
|                                                          | 頂心規格<br>Size of center                            | -       | MT#4                                |              |
|                                                          | 尾座移動速度<br>Moving speed of tailstock               | mm/min  | 手動 Manual                           |              |
|                                                          | 尾座套筒行程<br>Stroke of quill                         | mm      | 70                                  |              |
| 馬達功率<br>Power Rating                                     | 砂輪軸馬達<br>Grind wheel motor                        | HP      | 10HP                                |              |
|                                                          | 主軸用馬達<br>Workhead motor                           | HP      | 2HP                                 |              |
|                                                          | 工作臺橫移用馬達(Z軸)<br>Table traverse motor (Z axis)     | NM      | SYNTEC 8.3NM                        |              |
|                                                          | 尾座橫移用馬達<br>Tailstock move motor                   | -       | non                                 |              |
|                                                          | 砂輪進給(X軸)<br>Cross feed motor (X axis)             | NM      | SYNTEC 5.3NM                        |              |
|                                                          | 潤滑系統及冷卻<br>Lubricating system                     | HP      | 1                                   |              |

※本公司可依需要變更上列規格，恕不另外通知。 All specifications are subject to change without notice.

標準配件

|          |       |
|----------|-------|
| 1. 砂輪法蘭  | 2 Set |
| 2. 砂輪修正器 | 1 Set |
| 3. 法蘭拆卸器 | 1 Set |
| 4. 調整量錶  | 1 Set |
| 5. 防水板   | 1 Set |
| 6. 水機    | 1 Set |
| 7. 頂針    | 1 Set |
| 8. 手工具   | 1 Set |
| 9. 中心扶架  | 3 Set |
| 10. 砂輪   | 1 Pcs |

STANDARD ACCESSORIES

|                         |       |
|-------------------------|-------|
| 1. Flange               | 2 Set |
| 2. Dresser              | 1 Set |
| 3. Flange puller        | 1 Set |
| 4. Gage                 | 1 Set |
| 5. Coolant Splash Guard | 1 Set |
| 6. Tank                 | 1 Set |
| 7. MT4 Center           | 1 Set |
| 8. Tool Box             | 1 Set |
| 9. Steady rest          | 3 Set |
| 10. Wheel               | 1 Pcs |



## 拋光機 POLISHING MACHINE

| 項目 ITEM                          | 機種 MODEL                                       | 單位 UNIT | Traveling Head         |         |         |
|----------------------------------|------------------------------------------------|---------|------------------------|---------|---------|
|                                  |                                                |         | FPH800                 | FPH1000 | FPH1200 |
| 工作能力<br>Working Capacity         | 最大旋徑<br>Max. swing over bed or table           | mm      | 800                    | 1000    | 1200    |
|                                  | 最大輓筒長度(mm)<br>Max. workpiece length            | M       | 6, 8, 10, 12           |         |         |
|                                  | 工件最大重量<br>Max. weight of roll                  | Tons    | 3                      |         |         |
|                                  | 工件最大直徑<br>Max. workpiece diameter              | mm      | 800                    | 1000    | 1200    |
|                                  | 砂輪主軸轉速<br>Rotating speed of wheel              | R.P.M   | 100-2500               |         |         |
|                                  | 砂輪頭自動進給量<br>Cross feed per pulse               | mm/p    | 0.01                   |         |         |
| 工作台 (Z軸)<br>Table (Z Axis)       | 工作台行程 (Z軸)<br>Travel of table or head (Z axis) | mm      | 6, 8, 10, 12           |         |         |
|                                  | 工作台進給速度<br>Travel speed of table               | mm/min  | 350~3000               |         |         |
| 中心扶架<br>Neck rests               | 支承範圍<br>Roll neck diameter range               | mm      | φ100-φ420              |         |         |
| 主軸頭 & 尾座<br>Workhead & Tailstock | 工作主軸轉速<br>Rotation speed of work head          | R.P.M   | 15-300                 |         |         |
|                                  | 頂心規格<br>Size of center                         | -       | MT#6                   |         |         |
|                                  | 尾座移動速度<br>Moving speed of tailstock            | mm/min  | 500                    |         |         |
|                                  | 尾座套筒行程<br>Stroke of quill                      | mm      | 120                    |         |         |
|                                  | 主軸用馬達<br>Work head motor                       | HP      | 40                     | 40      | 50      |
|                                  | 工作台橫移用馬達(Z軸)<br>Table traverse motor (Z axis)  | NM      | SYNTEC 27<br>FANUC 22  |         |         |
|                                  | 尾座橫移用馬達<br>Tailstock move motor                | HP      | 1                      |         |         |
|                                  | 砂輪進給用馬達 (X軸)<br>Cross feed motor               | NM      | SYNTEC 11.5<br>FANUC 8 |         |         |

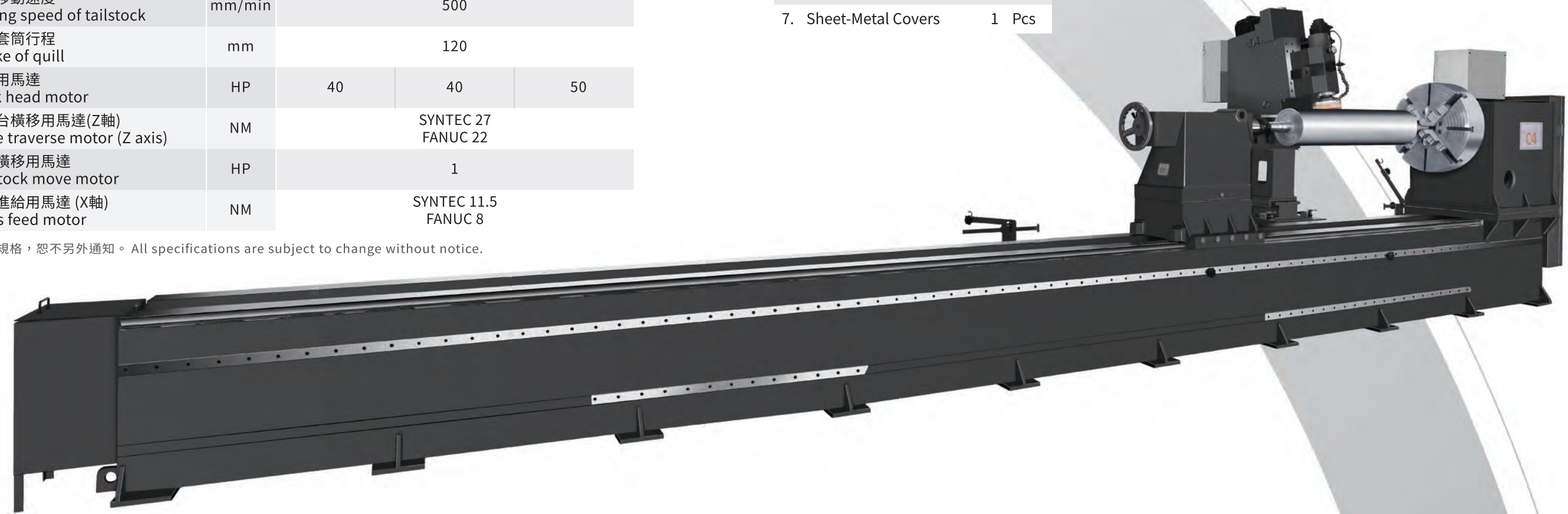
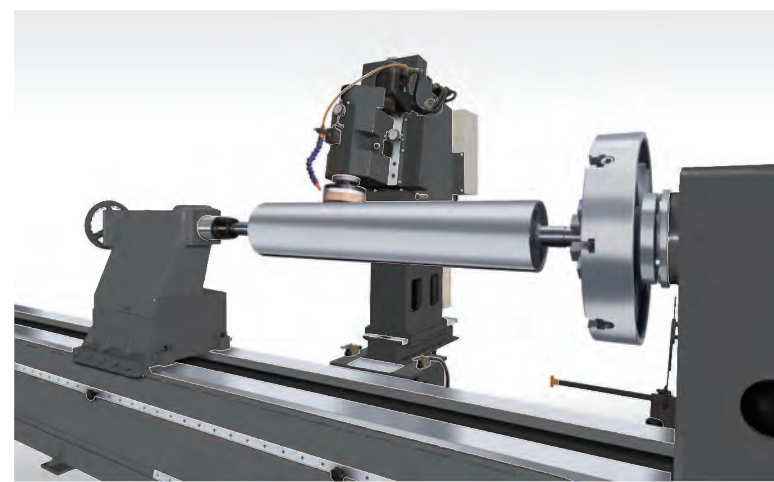
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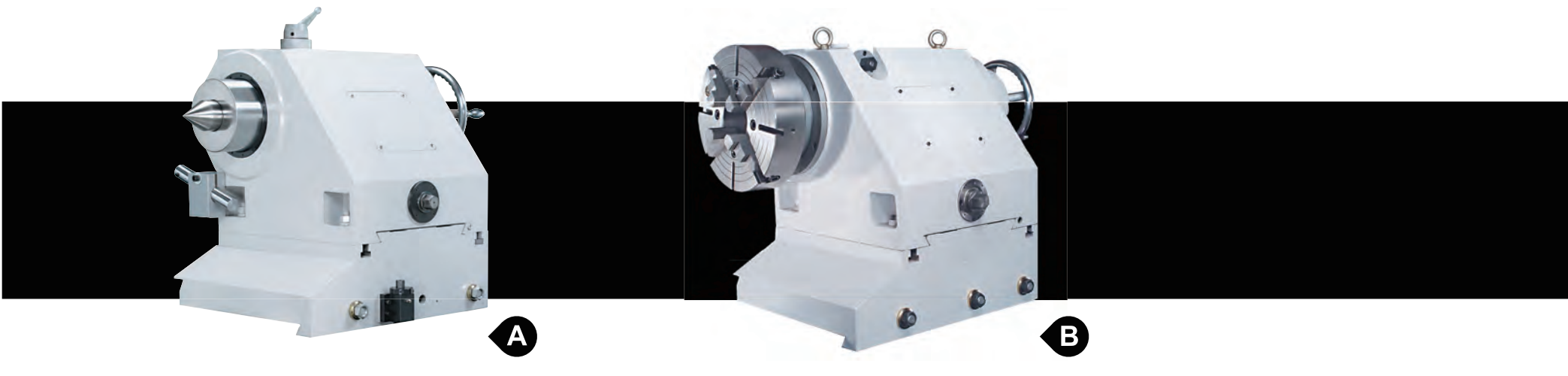
### 標準配件

|         |       |
|---------|-------|
| 1. 拋光砂輪 | 2 Pcs |
| 2. 調整量錶 | 1 Set |
| 3. 防水板  | 1 Set |
| 4. 頂針   | 2 Set |
| 5. 手工具  | 1 Set |
| 6. 中心扶架 | 2 Set |
| 7. 防塵護蓋 | 1 Pcs |

### STANDARD ACCESSORIES

|                       |       |
|-----------------------|-------|
| 1. Polishing wheel    | 2 Pcs |
| 2. Gage               | 1 Set |
| 3. Splash Guard       | 1 Set |
| 4. Center             | 2 Set |
| 5. Tool Box           | 1 Set |
| 6. Steady rest        | 2 Set |
| 7. Sheet-Metal Covers | 1 Pcs |





**A 尾座 TAILSTOCK**

- **砂輪修整器**  
砂輪修整器安裝在尾座本體上，可修整砂輪正面及側面。
- **軋輥對心校正**  
尾座是由上、下本體所組成。依據程式所設定之直線、斜線或曲線，可利用尾座之上半部之橫向調整作軋輥之對心校正。
- **尾座移動馬達驅動**  
尾座於床台上之縱向移動採馬達驅動，配合平面空氣軸承輔助移動，以減少摩擦力及降低磨耗。
- **超大尾座套筒**  
超大直徑尾座套筒，經中週波熱處理。表面鍍硬鉻，再經精密研磨。具有耐磨耗、荷重能力大等特色。
- **WHEEL DRESSER**  
The wheel dresser is mounted on the tailstock allowing for dressing the front and side of a grinding wheel.
- **ROLL CENTER ALIGNMENT**  
The tailstock consists of two parts. According to the straight line, skew line or curve set by programs, the operators may conduct roll center alignment by adjusting the upper part of the tailstock.
- **TAILSTOCK MOVEMENT DRIVEN BY MOTOR**  
The tailstock moving along the bed (longitudinal) is driven by a motor, which combined with air bearing for moving assistance to reduce friction and wear.
- **OVERSIZED TAILSTOCK QUILL**  
The oversized tailstock quill is subject to intermediate frequency heat treatment. Quill surface is hard chrome plated and precision ground, featuring wear-resistance and great loading capacity.

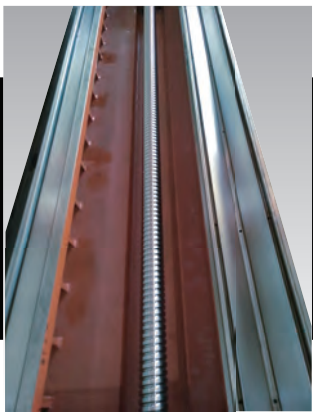
**B 旋轉式尾座 ROTATING SPINDLE OF TAILSTOCK**

(L, M型選配) (Optional for L, M types)

- 旋轉式尾座附四爪夾頭為選配。
- The rotating spindle of tailstock equipped with a four-jaw chuck is optional.

**C 工作台 TABLE**

- **高級材質**  
工作台採用 FC25~FC30 鑄鐵一體鑄造成型，再經過 600°退火及 48 小時自然冷卻以消除工作台之內應力。
- **動靜壓潤滑系統**  
工作台採用動靜壓複合循環潤滑系統，可承受不平均之壓力，穩定順暢的潤滑效果，使零組件間的磨耗降至最低程度。
- **優異穩定性**  
降低床台高度，並加寬工作台寬度，以提升穩定性與結構強度，確保均勻的輥筒表面精度。
- **HIGH QUALITY MATERIAL**  
The table is one-piece fabricated by high quality cast iron (FC25~FC30), tempered by 600° and naturally cooled for 48 hours to relieve internal stress of the table.
- **HYDRODYNAMIC HYDROSTATIC COMPLEX LUBRICATION SYSTEM**  
The table employs a hydrodynamic hydrostatic complex lubrication system, allowing the table to resist uneven loads. The stable and smooth lubrication effect reduces friction and wear between parts to a minimum.
- **EXCELLENT STABILITY**  
The lower bed height combined with increased table width provide an increase in stability and structural strength, resulting in even roll surface finish.



D



E



F

D 底座 BASE

- 穩重的底座
  - 底座採用 FC25~FC30 鑄鐵一體鑄造成型，再經過 600°退火及 48 小時自然冷卻以消除工作台之內應力。
  - 底座結構設計經電腦輔助分析，配合米字形肋骨強化，徹底表露非凡的結構剛性。
- MASSIVE BASE
  - The base is one-piece fabricated by high quality cast iron (FC25~FC30), tempered by 600° and naturally cooled for 48 hours to relieve internal stress of the base.
  - The design of base structure is subject to computer-assisted analysis in combination with radical shaped rib reinforcement that fully exhibits outstanding structural rigidity.

E CNC控制器 CONTROLLER

- CNC 控制器

此系列機種採用日本發那科及西門子 CNC 控制器，既精準且易於學習操作。
- 外圓、錐面、端面研磨

備有研磨工序巨集指令，可應用於各種外圓、錐面及端面之精磨及火花研磨。
- PLC 控制

電腦主控系統內含 PLC 可程式控制單元，易於維護。
- CNC CONTROLLER

The series of machine is equipped with Japan FANUC and Germany Siemens CNC controller, featuring high precision and is easy to learn.
- CYLINDRICAL, TAPERED SURFACE & END FACE GRINDING

The controller provides macro commands for grinding process, which is applicable for finish and spark-out grinding on cylinder, tapered surface and end face.
- PLC CONTROL

The main control system integrates a PLC control, making maintenance easy.

F 砂輪頭 WHEELHEAD

- 砂輪頭

砂輪頭安裝於進刀座 (X 軸)。
- 精密砂輪主軸

砂輪主軸採用鎳鉻鉬合金鋼製成，經調質處理、熱處理、動平衡校正及精密研磨。
- 動靜壓複合軸承

砂輪主軸採用動靜壓複合軸承支撐。砂輪主軸靜止時由靜壓壓力支撐，動壓油膜在心軸運轉時產生剛性油膜，提供穩定的切削壓力。
- 砂輪主軸運轉於油膜上

砂輪主軸運轉前，油壓系統會供應足夠壓力之液壓油。當壓力開關偵測到油壓壓力已到達設定值時，砂輪主軸才會啟動運轉。砂輪主軸停止前，液壓油仍持續供應至砂輪主軸完全停止為止，以避免砂輪主軸之磨耗。
- WHEEL HEAD

The wheel head is mounted on the carriage (X-axis).
- HIGH PRECISION WHEEL SPINDLE

The wheel spindle is manufactured from Nickel Chromolybdenum alloy steel, tempered, heat-treated, dynamically balanced and precision ground.
- HYDRODYNAMIC HYDROSTATIC COMPLEX BEARING

The wheel spindle is supported by hydrodynamic, hydrostatic complex bearings. When the wheel spindle stops, it is supported by hydrostatic pressure. While the wheel spindle is running, the hydrodynamic oil film will create rigid oil film providing a stable cutting pressure.
- WHEEL SPINDLE RUNS ON OIL FILM

Before the wheel spindle starts running, the hydraulic system will supply sufficient pressure of hydraulic oil. Once the pressure switch detects the hydraulic pressure has reached the setting value, the wheel spindle will start running. Before the grinding wheel stops, hydraulic oil will continue to supply until the wheel spindle comes to a complete stop. This may prevent the wheel spindle from wearing.

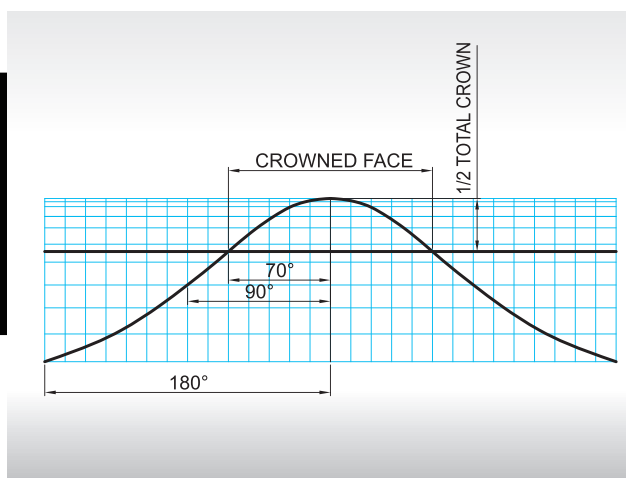


G

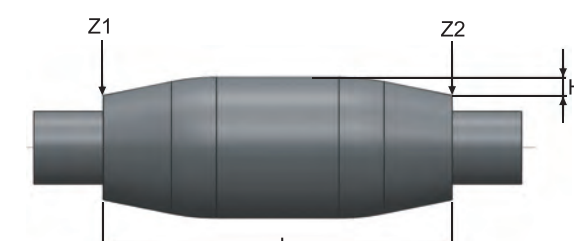
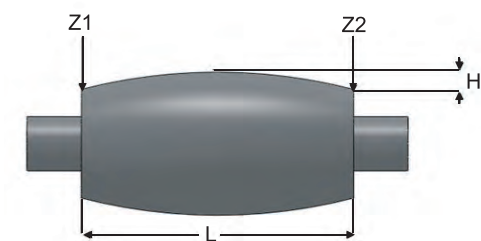
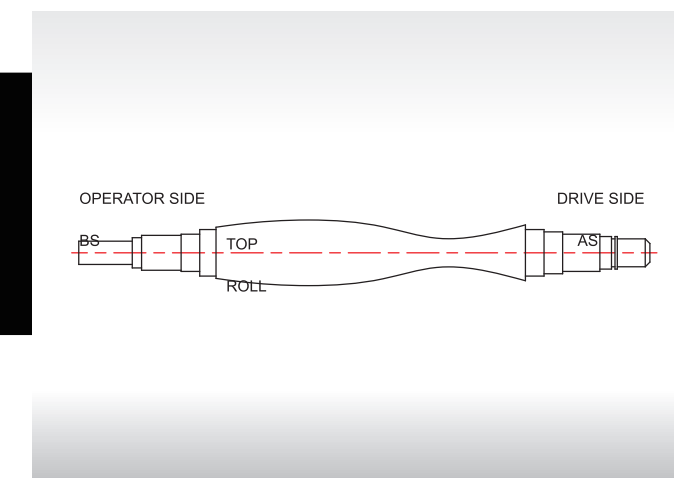
## G 主軸頭座 HEADSTOCK

- **高剛性主軸頭座**
  - 主軸頭座結構設計，經由電腦輔助分析，具有高承載力，且不易產生共振。
  - 主軸頭結構高剛性。非迴轉式設計，有助於提升荷重剛性。
  - 工作主軸採用精密滾柱軸承，並經由時規皮帶傳動，展現精密無振顫之運轉特性。
- **工件驅動方式**
  - S40 / M60: 有旋轉式及非旋轉式。
  - L85: 旋轉式設計。以頂針配合牽轉具或四爪夾頭驅動工件。
- **HIGHLY RIGID HEADSTOCK**
  - The headstock structure design is subject to a computer-assisted analysis to achieve high leading capacity while reducing resonance to a minimum.
  - The headstock with maximum structural rigidity is a non-swiveling design that aids in loading rigidity.
  - The work spindle runs in high precision roller bearings and is transmitted through timing belts, exhibiting precise and chatter-free running.
- **WORKPIECE ROTATION DRIVE METHODS:**
  - S40/M60: Rotating and non-rotating methods.
  - L85: Rotating type. Using a center combined with a driving dog or a 4-jaw chuck to drive the work piece.

## SINE曲線 & COSIN曲線



## CVC曲線



- **電腦計算砂輪路徑**

對於軋輥之中凸研磨，操作者可利用程式指令，指定軋輥中凸高度及長度。並可由電腦精準算出砂輪之進刀路徑，達到高精度、精緻之軋輥中凸研磨效果。
- **程式儲存**

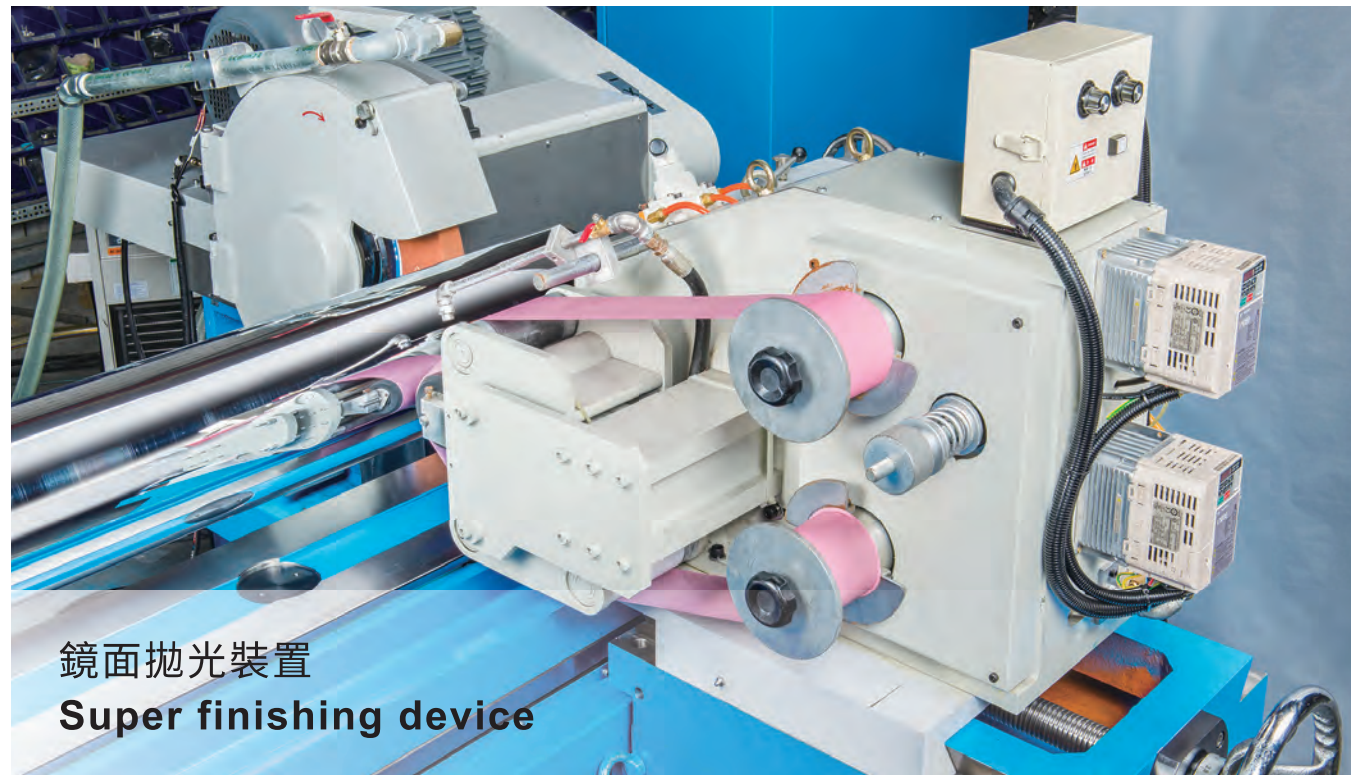
可將程式建檔儲存，以便日後重複使用。
- **曲線擴充 隨心所欲**

多種研磨曲線可選擇，例如：Sine 曲線、Cosin 曲線、CVC 曲線、經驗值曲線等。
- **COMPUTER CALCULATION FOR WHEEL PATH**

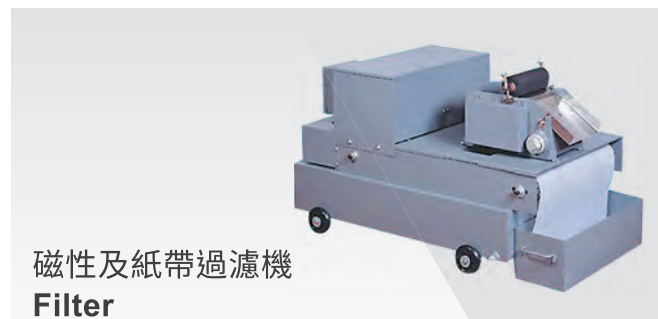
In crown grinding on roll, the operator may use program commands to specify the crown height and length. The computer will calculate the feed path of the grinding wheel, and a high accuracy, fine finish crown grinding effect on roll can be achieved.
- **PROGRAM SAVING**

Creating a file for saving programs for repetitive use in the future.
- **EXPANSIVE CURVE TYPES**

Various curve types are available to select, including sine curve, cosine curve CVC curve and experienced value curve.



鏡面拋光裝置  
Super finishing device



磁性及紙帶過濾機  
Filter



線上量測裝置  
Inprocess  
measuring



自動砂輪動平衡系統  
On-line balanced system



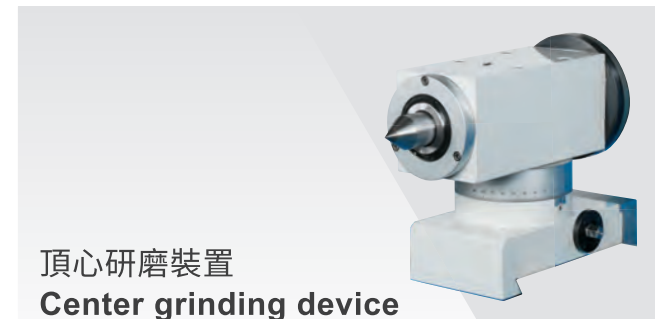
砂輪法蘭 & 靜態砂輪  
平衡儀 & 平衡棒  
Flange & balance  
10 device and arbor



軋輥卡式量表規  
Roll caliper



萬向接頭  
Universal joint



頂心研磨裝置  
Center grinding device



重型中心扶架  
Heavy duty 2 points  
steady rest support



側面修整座  
Face & angular dresser



中心扶架  
2 points steady rest support

#### 標準配備

- 標準砂輪
- 砂輪法蘭
- 砂輪修正器
- 法蘭拆卸器
- 調整量錶
- 防水板
- 磁性及紙帶過濾機
- MT#5或MT6頂針
- 手工具
- 中心扶架
- 鈹金式防塵護蓋
- 靜態砂輪平衡儀及平衡棒

#### STANDARD ACCESSORIES

- Grinding wheel
- Flange
- Dresser
- Flange puller
- Gage
- Splash guard
- Filter
- Center (MT#5 or MT#6 or PT#100)
- Tool box
- Support
- Sheet-metal covers
- Device and arbor

#### 選購配備

- 重型中心扶架
- 頂心研磨裝置
- 工件牽轉具
- 萬向接頭
- 四爪單動夾頭
- 活動頂針
- 備用砂輪法蘭
- 備用砂輪
- 轉軸式尾座
- 手提式砂輪動平衡校正儀
- 自動砂輪動平衡系統
- 軋輥卡式量表規
- 集塵裝置 (乾磨式)
- 光學尺
- 軋輥特殊曲線加工程式

#### OPTIONAL ACCESSORIES

- Heavy duty support
- Center grinding device
- Carrier
- Universal joint
- 4-jaws chuck
- Live center
- Spare flange
- Spare grinding wheel
- Rotating spindle type tailstock
- Portable balancer
- Auto balancing system
- Roll caliper
- Dust collector
- Linear encoder
- Grinding program