Specifications 主要規格

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>MODEL 項目</th>
<th>GL-360</th>
<th>GL-360</th>
<th>GL-360</th>
<th>GL-360</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. pull capacity / 力矩最大公稱力</td>
<td>N</td>
<td>1590</td>
<td>1590</td>
<td>1590</td>
<td>1590</td>
</tr>
<tr>
<td>Stroke length</td>
<td>mm</td>
<td>Max.30</td>
<td>Max.30</td>
<td>Max.30</td>
<td>Max.30</td>
</tr>
<tr>
<td>Capacity output / 輸出功率</td>
<td>mm</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Stroke per minute / 每分鐘行程</td>
<td>mm</td>
<td>100-500</td>
<td>100-500</td>
<td>75-350</td>
<td>75-350</td>
</tr>
<tr>
<td>Bore size / 工作面徑</td>
<td>mm</td>
<td>5500x750</td>
<td>1500x750</td>
<td>1000x850</td>
<td>2300x1000</td>
</tr>
<tr>
<td>Bore size / 工作面徑</td>
<td>mm</td>
<td>1000x500</td>
<td>1200x200</td>
<td>1000x250</td>
<td>2100x300</td>
</tr>
<tr>
<td>Stroke adjustment / 進行程調整範圍</td>
<td>mm</td>
<td>300-400</td>
<td>300-400</td>
<td>300-400</td>
<td>300-400</td>
</tr>
<tr>
<td>Stroke adjustment / 退行程調整範圍</td>
<td>mm</td>
<td>100-350</td>
<td>100-350</td>
<td>100-350</td>
<td>100-350</td>
</tr>
<tr>
<td>Linear stroke / 往復行程</td>
<td>mm</td>
<td>200 x 200</td>
<td>200 x 200</td>
<td>220 x 30</td>
<td>220 x 30</td>
</tr>
<tr>
<td>Motor / 進行程</td>
<td>kW</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Motor / 退行程</td>
<td>kW</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Specified speed step control / 指定速度步進控制</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Stroke stop setting / 力矩停止設定</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Monitor control / 監控控制</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Parameters memory capacity / 存儲容量</td>
<td>kbytes</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Air blow / 空氣清潔</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Spindle &amp; motor control / 轉塔及電機控制</td>
<td>Max.2 sets</td>
<td>△ 3 output/4 sets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spindle &amp; motor control / 轉塔及電機控制</td>
<td>Max.2 sets</td>
<td>△ 3 output/4 sets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed &amp; back safety door / 前後安全門</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Speed control by frequency/auto / 頻率/自動控制</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Automatic die-filler / 自動充填裝置</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Die diameter / 模腔</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Hydraulic die clamping device / 模腔加壓裝置</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Quick left die / 快速模具裝置</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
<tr>
<td>Anti-vibration device / 防震裝置</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td>△</td>
<td></td>
</tr>
</tbody>
</table>

Note: ○ standard accessories, △ optional equipment. 註： ○ 標準配備 △ 選購配備。
Specifications and design characteristics are subject to change without prior notice. 設計特性及規格若有變更，恕不另行通知。

FAIR OAKS PRECISION MACHINERY CO., LTD.

台湾 42932 台中市神岡區新興路171號
No.171, Xinxing Rd., Shengang Dist., Taichung City 42953, Taiwan.

Tel.: 886-4-2563 2320  Fax: 886-4-2563 3133
URL: www.fairoaks-press.com.tw  E-mail: goaljump@msa.hinet.net
**Knuckle Type High Speed Precision Press**

**MACHINE FEATURES**

**FRAME**

- Manufactured from high tensile cast iron, stress relieved for maximum rigidity and long-term accuracy.
- The frame structure is designed by means of "Computerized finite element analysis", it provides optimum design for frame strength and strain.
- The frame is tightened by tie-rods, incorporating with hydraulic preload on structure for giving added rigidity.

**MINIMUM VIBRATION, MINIMUM NOISE**

- Outstanding dynamic balancing design reduces vibration and noise to a minimum.
- LUBRICATION SYSTEM

- Employs a forced lubrication with cooling system to minimize thermal strain of machine frame, upgrade stamping quality and extend service life of the machine. The lubrication system is provided with a pressure detection device.

**USER-FRIENDLY CONTROL**

Fair Qalka knuckle type high speed precision press is equipped with an advanced conversational control. The specially designed software features extremely powerful control functions. Outstanding conversational control is user-friendly and assures maximum operation convenience.

- Memory capacity is up to 10 sets of machining data.
- Conversational operation control.
- Self-diagnostic function combined with error message display makes maintenance easier.
- Conversational trouble shooting greatly shortens maintenance time and the machine downtime.
- Most functions are controlled through the screen eliminating numerous keys control.

**OUTSTANDING FEATURES OF KNUCKLE TYPE STRUCTURE**

The specially designed knuckle type structure permits extremely uniform punching load on the head. This greatly reduces punching torque applied on the head, resulting in a minimum structural deformation.

The knuckle type structure features superior motion curve, which effectively reduces the mold impact and speed against the material. Impact speed reduces up to 40%.

**Head Deformation Diagrams**

- The red indicates the load position.
- The blue indicates the load position.
- The green indicates the load position.

**HIGH SPEED ACCELERATOR OF THE SLIDE (OPTIONAL EQUIPMENT)**

The high speed accelerator of the slide provides the operator with a convenient method of checking and fixing mold/die problems. If stock feed errors occur, this prevents damage or loss to the mold edge and punch. Safety and convenience are immensely improved as the patented hydraulic loop design of the slide accelerator overcomes jumping scrap and setup errors that cause load and sticking problems.

**低摩擦高精度滚珠系统**

- 采用高级特种滚珠，确保精度一致。
- 滚珠系统采用高精度滚珠，确保精度一致。
- 滚珠系统采用高精度滚珠，确保精度一致。
- 滚珠系统采用高精度滚珠，确保精度一致。

**润滑系统**

- 本系统采用高精度滚珠系统，可降低摩擦系数，确保精度一致。
- 本系统采用高精度滚珠系统，可降低摩擦系数，确保精度一致。
- 本系统采用高精度滚珠系统，可降低摩擦系数，确保精度一致。
- 本系统采用高精度滚珠系统，可降低摩擦系数，确保精度一致。

**滑座快速上昇装置**

- 滑座快速上昇装置，提供操作者更方便的模具快速上昇及快速下降。
- 滑座快速上昇装置，提供操作者更方便的模具快速上昇及快速下降。
- 滑座快速上昇装置，提供操作者更方便的模具快速上昇及快速下降。
KNUCKLE TYPE HIGH SPEED PRECISION PRESS:
STRUCTURE AND OPERATION

1. Kinetic energy produced by the flywheel passes through the clutch and rotates the crankshaft (1) in a clockwise direction.

2. Eccentric geometric sections of crankshaft (1) at linkage (A) and linkage (B) drive the crankshaft connecting rods (2).

3. Column blocks (3) move in a horizontally symmetrical, reciprocating motion. Slides (4) and tandem pillar connecting rods (5) attach through the central hole of the column block (3) with dynamically balanced connecting rods (8). The opposite ends of the pillar connecting rods (5) are connected to the guide post (6) and pillar tension bar (7) that ensures the horizontal gap (X) remains constant. Changes in the vertical gap (Y) result, forming the press stroke.

DYNAMIC BALANCE DEVICE

The purpose of installing the dynamic balance device is to balance the slide block and upper mold. During production, vertical motion produces momentum and equips the upper mold with a weight bearing capacity and improves overall dynamic balance of the press. The diagram below illustrates the entire design of the dynamic balance device and design of the vertical guide retaining bracket, demonstrating dramatically improved stability and working life of the press.

Dynamic balance device
動態平衡裝置

Dynamic balance vertical guide
動態平衡導正機

Vertical guide retaining bracket
導正機上下固定座
SLIDE BASE DESIGN
The main function of the load bearing slide base is to support the slide during eccentric press loads caused by side thrust, and to ensure perpendicularity and parallelism during vertical motion of the slide.

The present design features four groups of octahedral level needle roller bearings, knuckle needle roller bearings, retainer, differential, and slide base all compose precision components. Via the stationary traction guide of the retainer, as well as the differential actuator, the lightweight needle roller bearings ensure that differential motion remains even throughout, as well as avoid inertia from load related structural damage to the retainer during vertical motion of the slide. This design exhibits large load capacity of the needle roller bearings, high precision, ease of maintenance and a long service life.

HYDROSTATIC BEARING
As the diagram below illustrates, when load is transmitted through the column slide block to the headstock on the lever type press, it passes punch load through the hydrostatic bearing which occupies the space between the column slide block and the headstock.

The hydraulic oil used by the hydrostatic bearing minimizes the friction coefficient, maximizes vibration damping, while load capacity, rigidity and precision are very high. In contrast to the hydrostatic bearing design of general presses, wear and tear during production caused by mold and bearing brass sticking, high vibration etc. are overcome and ameliorated.

静壓軸承特性
由封密式浮球結構示意图所知，當沖壓負載經油柱葉滑塊傳達至鋼模時，柱葉滑塊與鋼模間將透過靜壓軸承承載負載。

由於靜壓軸承使用油液作為介質，因此其摩擦係數非常低且振動減震性高，負載容量大、壽命長、高精度等特性。而相對於一般浮環的動壓軸承設計，在沖壓時所產生之死點膨脹現象及銅環黏附現象均得以克服及獲得改善。