

ZHEJIANG JINAOLAN MACHINE TOOL CO., LTD

Automation Line Designer and Manufacturer

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Heavy Duty Power Press

Heavy Duty Multi-station Power Press

The multi-station press is equipped with multiple stations on one press, equipped with an automatic feeding device, and each station is simultaneously pressed during one operation.

The structure of large multi-station mechanical press is composed of thin steel plate unloading and loading device, workpiece conveying system, hydraulic cushion device of the first station, quick die change system with moving bolster, large multi-station press control system and other components.

Thin steel plate unloading and feeding device: The fully automatic multi-station press requires a corresponding automatic steel plate unloading and automatic feeding device. This unit can be continuously produced when the blank material is replaced and the double-layer sheet is selected. And generally there is the function of cleaning and lubricating the sheet. The sheet is picked up by a magnetic delaminator and a suction cup and passed through the raceway into the positioning station.

Transfer system for workpieces: On large multi-station presses, the transfer between workpieces is done through a three-coordinate controlled clamping system. The longitudinal, lateral and up-and-down motion of the clamping system is a curved trajectory which is produced by a double cam mechanism.

Hydraulic cushion device of the first station: The hydraulic cushion device has four independent pressure cylinders. When the slider moves down, the piston cylinder transmits the tensile force to the die pressing edge through the return bridge and the four pressure columns. After reaching the bottom dead center, it can be returned along with the punch without control, or the cushion device can be re-arrived to the upper position by returning cylinder according to the stop time given in advance.

In order to avoid an eccentric load on other stations caused by a large drawing force, the first station slider is a separate single slider. In order to obtain good forming conditions without reducing production efficiency, the first station must be multi-link transmission, and the

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subsequent stations can adopt a crank-link structure to reduce costs.

Quick die change system with moving bolster: Flexibility and high utilization require minimal adjustment and preparation time of press machine. In order to automatically change the mold, the large multi-station press is equipped with 2, 4 or 6 moving working tables corresponding to the slider. At the production time, the molds on the working table of the press including the clamping system, can be replaced and adjusted. In order to take up less of the press's working time, the adjustment of the clamps and sliders, the clamps and the mold can be carried out on a three-coordinate control simulator.

With the help of standardized molds, hydraulic quick clamping devices, coupling of various pre-selected devices and clamping conveyors, and computer control of the entire process, the time required to replace the loading system, the three-coordinate conveying system, and the mold and finished stacking system is only about 10min (occupied equipment time). The entire adjustment system is able to extract special parameters of the mold, such as displacement, speed and pressure, from the memory storage through program control system.

Large multi-station press control system: The control system of large multi-station press including sheet feeding system and stacking system is divided into two parts: one is the regular safe working control, and the other is the automatic operating system and memory storage program control for replacement adjustment. The multi-station press has a programmable control device controlled by a microprocessor. The control system includes an operation panel, a fault display device, a data collection and display device, and a screen display monitoring system for part processing input and part data storage. Approximately 50 control shafts are available in the unit to automatically adjust stroke and pressure when changing molds.

Automatic stacking device for finished stamping parts: The finished stamping parts are clamped out by the clamping system and sent to the stacking station. The workpiece is transferred by the clamping system of the press to the workpiece conveyor through a checkpoint. The two CNC servo mechanisms put the workpiece in a fixed position of the part

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box according to the size and shape of the workpiece. There are stackers on both sides of the conveyor belt to ensure that the parts box is replaced without interrupting production, and the well stacked parts are sent to the stamping parts warehouse.

Large multi-station presses have the following advantages:

- A. With high stamping productivity, the average productivity is 600~900 pieces/h;
- B. 50% smaller in floor area than the ordinary press line;
- C. Quality of stamping parts improved;
- D. Save kinetic energy consumption;
- E. Only 2~3 people are required to operate;

With the development of large multi-station presses, its structural characteristics have also undergone major changes. The specific changes are as follows:

- A. Feeding system is developed from mechanical transmission to electrical chain;
- B. Three-coordinate feeding mechanism develops in the direction of flexibility
- C. The air cushion is developed from the original lower air cushion to the upper and lower air cushions, which greatly simplifies the die structure and reduces the cost of the die. The lower air cushion is developed from a pure air cushion to a large tonnage CNC hydraulic cushion.